



City of Austin Invasive Species Management Plan Appendices



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City of Austin Invasive Species Management Plan

Appendix A



RESOLUTION NO. 20100408-030

WHEREAS, an “invasive species” is defined as a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112); and

WHEREAS, invasive and/or undesirable aquatic, riparian and terrestrial species influence the productivity, value, and management of a broad range of land and water resources in the City of Austin; and

WHEREAS, these undesirable species have significant negative economic, social and ecological impacts which can include, but are not limited to:

- a. Reduction of native biodiversity resulting in reduced ecosystem stability, resilience, and carrying capacity;
- b. Interference with ecosystem functions by changing processes like fire, nutrient flow, and flooding;
- c. Degradation of aquatic systems including obstruction of water flow.
- d. Reduction of the value of streams, lakes and reservoirs, for recreation, wildlife habitat and public water supply;
- e. Alteration of the regional distinction of flora and fauna;
- f. Interference with the aesthetics and recreational value of natural areas, parks, and other areas;
- g. Adverse impacts on human health;

- h. *Decreased real estate property value and increased costs of property development; and*
- i. *Loss of native seed bank needed for regeneration.*

WHEREAS, the City of Austin currently spends tax dollars and the citizens of Austin contribute hundreds of volunteer hours on removal of invasive plant species; and

WHEREAS, the problems associated with invasive plant species are expected to be exacerbated by global climate change; and

WHEREAS, the City of Austin is prohibited by state law from regulating the distribution or sale of invasive species other than those listed on state or federal lists of noxious or invasive species; and

WHEREAS, the economic and environmental damage from invasive species will continue to rise in Austin without a well-organized and adequately funded effort to implement preventive programs; **NOW, THEREFORE,**

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

The Austin City Council directs the City Manager to:

1. Develop an Invasive Species Management Plan for the control and/or eradication of undesirable aquatic and terrestrial species.
2. Estimate the annual costs to the City of Austin of invasive species removal/control which should include volunteer efforts on public lands.
3. Consider education and public awareness as a major component of the plan including Citizen Science programs that will

document, map and monitor invasive species and native flora and fauna.

4. Consider creating an Interdepartmental Invasive Species Management Working Group to facilitate plan development and to incorporate into the plan assessment and inventory of invasives; prevention, early detection and rapid response; and control, management, and restoration techniques.

BE IT FURTHER RESOLVED:

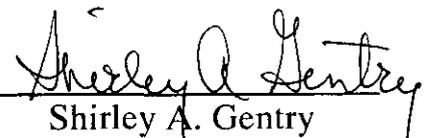
The City Manager is directed to report to Council on or before June 5, 2010 with an estimate of staff time and related costs to complete an Invasive Species Management Plan, and with an estimated feasible date to complete work on a draft plan for submission to Council.

BE IT FURTHER RESOLVED:

The City Council strongly encourages city departments, universities, community groups, and the private sector to collaborate and form partnerships to prevent new introductions of invasive species; for the enhancement, development and implementation of Integrated Pest Management programs; and to work together to develop sustainable funding and find creative new approaches for protecting and restoring the city's natural resources.

ADOPTED: April 8, 2010

ATTEST:


Shirley A. Gentry
City Clerk



MEMORANDUM

TO: Mayor and City Council

FROM: Sara L. Hensley, CPRP, Director, Austin Parks and Recreation
Victoria Li, Director, Watershed Protection Department
Greg Meszaros, Director, Austin Water Utility *G.M.*

DATE: June 3, 2010

SUBJECT: Invasive Plant Management Plan Resolution (CIUR #304)

On April 8, 2010 Council approved a resolution that addresses the expansion and negative economic, social and ecological impacts of invasive plant species on City of Austin public lands. An "invasive species" is defined as a species that is nonnative (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive and/or undesirable aquatic, riparian and terrestrial species influence the productivity, value, and management of a broad range of land and water resources in the City of Austin. Therefore, the City Council directed the City Manager to develop an Invasive Species Management Plan for the control and/or eradication of undesirable aquatic and terrestrial plant species.

A cross-departmental team was organized to determine the proposed management plan scope and completion time frame, identify budgetary requirements and to estimate staff time needed for plan development. Six departments participated in framing the scope and preliminary recommendations for this plan. This memorandum highlights the staff proposal for development of a city wide Invasive Species Management Plan.

Current invasive plant removal projects being undertaken within city departments have been tallied. The four departments, Watershed Protection (WPD), Austin Water Utility (AWU), Parks and Recreation Department (PARD), and Austin Energy (AE), are actively involved in 21 projects across the city. Currently, WPD and AE are primarily focused on the removal of aquatic species, while PARD and AWU primary focus is mainly on controlling invasive woody species. The city's cost to date for invasive plant management is estimated to be approximately \$3,436,605. A breakdown of those costs is attached for your review.

Next Steps:

1. The scope of the Invasive Species Management Plan will be a city wide plan with an overarching approach to invasive plant management on public lands. Individual departments would be charged with developing site specific invasive management plans

as needed. The plan would possibly include 10 year goals, a proposed 3 year work plan, estimated costs for plan implementation, and potential funding sources. Significant public input would also be integral to the plan development. Below are the proposed plan components.

- a) Plan Purpose & Introduction
 - b) Existing City Programs
 - c) Goals
 - d) Invasive Vegetation Inventory & Mapping
 - e) Prevention
 - f) Early Detection and Rapid Response
 - g) Control and Management Priorities (BMPs)
 - h) Restoration
 - i) Research
 - j) Organizational Collaboration
 - k) Costs & Funding Sources
 - l) Education and Public Awareness
 - m) Volunteer Programs
 - n) References & Appendices
2. Continue to convene the Interdepartmental Stakeholder Group to achieve short term objectives that can currently be met with existing staff and resources. Identified objectives include creating a city invasive plant list, standardizing purchasing and contractual service agreements, developing protocol for invasive removal, removing invasives on all city construction and Capital Improvement Projects, prohibiting the installation of invasive plants on city property, instituting a city-wide early detection and rapid response protocol, inventorying and mapping invasives on city lands, developing an education and outreach campaign and other coordinated activities as determined. It is estimated that the group would need to meet one to two times per month for the first year and each department would contribute approximately 250-500 hours of staff time to this initiative. The final outcome of the group's meetings would be to foster cross departmental coordination and meet tangible goals as opposed to developing a fully comprehensive city invasive species management plan.
3. Staff will hire a consultant, who is a known subject matter expert in the field of invasive plant management and native plant restoration practices that can develop the plan in cooperation with the interdepartmental stakeholder group and public stakeholders. An outside consultant offers legitimate credibility with the public and would effectively

provide a fair and global perspective towards the plan that is not biased towards one department's interests over another. They would also have the ability to be more focused and efficient in crafting the plan than a city wide working group.

In addition, hiring a consultant would be more cost effective and less time consuming over the long term. Staff already has limited time available for this initiative and without dedicated staff working on the plan full time it could take three years of staff time totaling approximately 500 to 1,000 hours per department to develop a final product. The state of our public lands can not wait any longer for a more coordinated action plan as they are already severely infested with exotic, invasive plants and the longer the city takes to create a comprehensive management plan the more money and resources will be spent to eradicate existing and new populations. A consultant would quickly expedite the plan development process and it would ultimately cost the city less money than creating the plan internally.

It is estimated that it would take approximately one year or more for a consultant to create a plan and the cost of the plan would be between \$68,000 and \$100,000. At least 100 to 200 hours per department would be required to coordinate with the consultant during the development process. Additionally, a dedicated staff person would need to spearhead the coordination on at least a part time basis. Once the consultant provides the plan, implementation would be the next step. It is anticipated that the plan will recommend a yearly expenditure to implement invasive plant control for a minimum number of years.

4. The Watershed Protection Department has funds from a vegetative control budget that can be used to hire a consultant and has offered to seek ways to encumber this money during the FY2010 fiscal year. The goal is to issue an RFP for a consultant by July 6th with bid submittals due on July 30th. The bid responses will be reviewed by an interdepartmental panel for a contract award by August 15, 2010.

If there are any questions, please feel free to contact any one of us.

Cc: Marc A. Ott, City Manager
Bert Lumbreras, Assistant City Manager
Sue Edwards, Assistant City Manager
Rudy Garza, Assistant City Manager

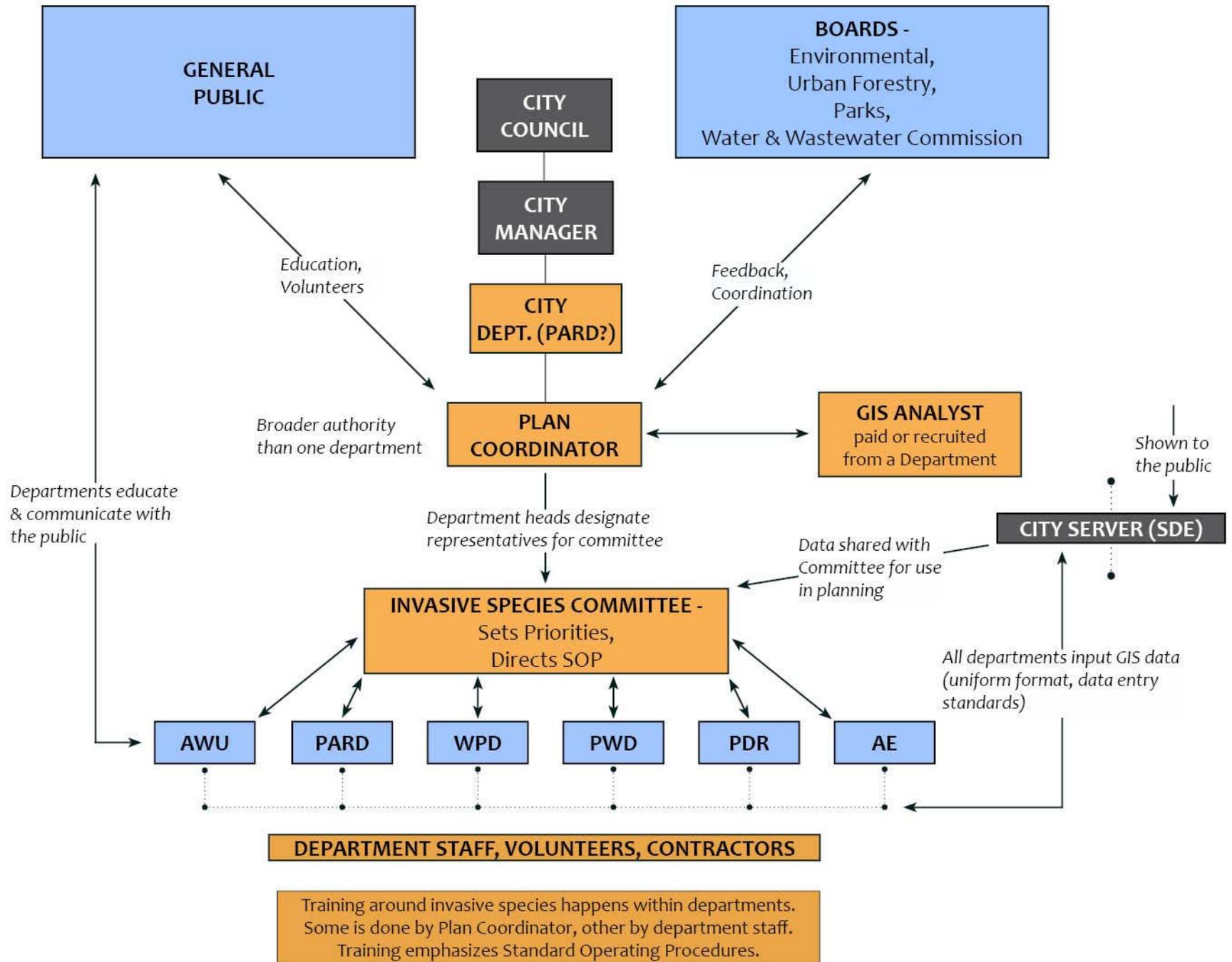


City of Austin Invasive Species Management Plan

Appendix B







COA Invasive Species Management Plan - Working Group Members

Keep Austin Beautiful (KAB)

Monica Magee / Jessica Wilson
Community Programs Manager
55 North IH 35, Suite 215
Austin, TX 78702
Email: Monica@KeepAustinBeautiful.org
Phone: 512.391.0619

Austin Parks Foundation (APF)

Charlie McCabe
Executive Director
816 Congress, Suite 1680
Austin, TX 78701
Email: cmccabe@austinparks.org
Phone: 512.477.1566 ext 2

Texas Parks & Wildlife (TPWD)

Kelly Conrad Bender
Urban Wildlife Biologist
944 Highway 71 East, Suite 110
Bastrop, TX 78602
Email: kelly.bender@tpwd.state.tx.us
Phone: 512.308.0979

Austin Invasive Species Coalition (AISC)

Environmental Corps at American Youthworks
Chris Sheffield
Program Director
1901 E Ben White Blvd
Austin, TX 78741
Email: CSheffield@americanyouthworks.org
Phone: 512.970.7684

Austin Energy (COA)

Primary: Eric Stager
Environmental Scientist, Senior
721 Barton Springs Road
Austin, TX, 78704
Email: eric.stager@austinenergy.com
Phone: 512.974.2702

Austin Water Utility, Water Quality Protection Lands (COA)

Primary: Matt McCaw
Biologist
Wildland Conservation Division
3621 South FM 620
Austin, TX 78738

Email: Matt.McCaw@ci.austin.tx.us
Phone: 512.972.1672

Parks and Recreation Department (COA)

Primary: Angela Hanson
Urban Forestry, City Liaison
301 Nature Center Drive
Austin, TX 78746
Email: angela.hanson@ci.austin.tx.us
Phone: 512. 974.9551

Planning and Development Review / City Arborist (COA)

Primary: Keith Mars
Environmental Program Coordinator
One Texas Center
505 Barton Springs Road, 4th Floor
Austin, TX 78704
Email: Keith.Mars@ci.austin.tx.us
Phone: 512.974.2755

Watershed Protection, Field Operations Division (COA)

Primary: Angela Gallardo
Conservation Program Coordinator
One Texas Center
505 Barton Springs Road
Austin, TX 78704
Email: Angela.Gallardo@ci.austin.tx.us
Phone: 512.974.3543
Secondary: Staryn Wagner (staryn.wagner@ci.austin.tx.us)

Watershed Protection, Environmental Resources Management (COA)

Primary: John Gleason, RLA
Engineering Associate C
One Texas Center
505 Barton Springs Road
Austin, TX 78704
Email: john.gleason@ci.austin.tx.us
Phone: 512.974.3543
Secondary: Mary Gilroy (mary.gilroy@ci.austin.tx.us)

Lady Bird Johnson Wildflower Center (LBJWC)

Damon Waitt, Ph.D., Senior Director. dwaitt@wildflower.org, 512-232-0110
Travis Gallo, Program Coordinator and Researcher, tgallo@wildflower.org, 512-232-0116
Michelle Bertelsen, Land Steward, mbertelsen@wildflower.org, 512-232-0171
Matt O'Toole, Project Manager-Environmental Designer, motoole@wildflower.org, 512-232-0134

Consultant

Juli Fellows, Ph.D., Facilitator, DocJuli@aol.com, 512-346-5830

COA Invasive Species Management Plan – Advisory Group Members

Austin-Bastrop River Corridor Partnership

Center for Environmental Research (CER)
2210 South FM 973
Austin, Texas 78725
Kevin Anderson, ABRCP Coordinator, Kevin.Anderson@ci.austin.tx.us

Austin Independent School District

1111 W. 6th Street
Austin, TX 78703
Lawrence Fryer, Chief Operations Officer, lawrence.fryer@austinisd.org

Austin Neighborhood Council

ANC, Box 176
Austin, TX 78767
Steven Aleman, President-Elect, stevenraleman@gmail.com

Center for Invasive Species Eradication – Texas Water Resource Institute

1500 Research Parkway, Suite 240
2118 TAMU
College Station, TX 77843-2118
Kevin Wagner, Associate Director, klwagner@ag.tamu.edu

Hill Country Conservancy

221 W 6th St # 350
Austin, TX 78701-3405
George Cofer, Executive Director, george@hillcountryconservancy.org

Lower Colorado River Authority

3700 Lake Austin Boulevard
Austin, TX 78703-3504
Contact 1: Ted Reiley, Natural Resources Conservation Coordinator, ted.reiley@lcra.org
Contact 2: Lee Fritsch, Natural Resources Conservation Coordinator, lee.fritsch@lcra.org

Native Plant Society of Texas (Austin Chapter)

805 N. Capital of Texas Highway
Austin, TX 78746
Meg Inglis, President, plantnative07@austin.rr.com

National Wildlife Federation - South Central Region

44 East Ave.
Austin, TX 78701
Marya Fowler, Senior Manager-Education, fowler@nwf.org

Native Plant Society of Texas

PO Box 3017
Fredericksburg, TX 78624
Lonnie Childs, President, state@npsot.org

Texas AgriLife Extension Service

Agriculture and Life Sciences Building
600 John Kimbrough Boulevard, Suite 509
7101 TAMU
College Station, TX 77843-7101
Don L. Renchie, Agricultural and Environmental Safety, d-renchie@tamu.edu

Texas Department of Agriculture

P.O. Box 12847
Austin, TX 78711
Awinash Bhatkar, Coordinator for Plant Quality, Awinash.Bhatkar@tda.state.tx.us

Texas Department of Transportation

125 E. 11th Street
Austin, TX 78701-2483
Dianna Noble, Environmental Affairs, Dianna.Noble@txdot.gov

Texas Forest Service

John B. Connally Building, Suite 419
301 Tarrow Street
College Station, TX 77840-7896
Jim Houser, Staff Forester III, jhouser@tfs.tamu.edu

Texas Invasive Plant and Pest Council

Malcolm Pirnie Inc.
100 Congress Ave # 1485
Austin, TX 78701-2763
Scott Walker, Malcolm Pirnie Inc., SWalker@PIRNIE.COM

Texas Nursery and Landscape Association

7730 S. IH 35
Austin, TX 78745
Jim Reaves, jim@tnlaonline.org

Texas State University System- Texas Research Institute for Environmental Studies

TRIES 181
Huntsville, Texas 77341-2506
Jerry Cook, Associate Professor, jcook@shsu.edu

The Nature Conservancy

200 E Grayson St # 202
San Antonio, TX 78215-1270
John Herron, Director of Conservation, jherron@tnc.org

US Fish and Wildlife Service

10711 Burnet Road # 303

Austin, TX 78758

Wendy Brown, Endangered Species Recovery Coordinator, wendy_brown@fws.gov

USDA-Natural Resources Conservation Service

101 South Main

Temple, TX 76501

Salvador Salinas, State Conservationist, Salvador.Salinas@tx.usda.gov

Dexter J. Svetlik, Assistant State Conservationist, Dexter.Svetlik@tx.usda.gov

University of Texas at Austin

VP for University Operations

PO Box 8180

Austin, TX 78713

John A Burns, Facilities Services, jaburns@mail.utexas.edu



City of Austin Invasive Species Management Plan

Appendix C



IMP Working Group Meeting
February 10, 11:00 am to 3:00 p.m.
Location: One Texas Center, 11th floor conference room "The Cavern"

Meeting Goals

1. Learn about each other & what experience and skills we each bring to this process.
2. Review the team charter, scope, timeline, and get [renewed] agreement to guidelines.
3. Share responses to top 3 questions submitted by EC.
4. Identify hopes and fears about the Plan and agree on a short list of qualities we want the Plan to have.
5. Begin to map the "top offenders" in the areas covered by the Plan and who has authority over those areas. Identify the criteria we use to describe "top offenders".
6. Agree on the sequence of decisions the group will make.
7. Agree on a meeting schedule.

Agenda

- 11:00 Welcome and meeting overview (goals, agenda, discussion guidelines)
Introductions – name, organization, what experience & skills we bring to the group.
- 11:20 Review team charter, scope, timeline. Get agreement to guidelines.
Share responses to top 3 questions submitted by Executive Committee.
- 11:50 Hopes and fears about the Plan
Agree on a short list of qualities we want the Plan to have.
- 12:30 Break
- 12:45 Mapping Exercise
Using a large map of the areas to be covered by the Plan, indicate the invasive species "top offenders" for the areas and also who has authority over each area/parcel.
- 1:25 Create a list of the characteristics or criteria group members use to identify a species as a "top offender". "What makes these species "top offenders"?"
- 2:25 Present flow chart of decisions to be made and timeline. Get agreement to sequence of decisions and schedule of meetings.
- 2:55 Evaluate the meeting
- 3:00 Adjourn

Purpose of the Plan

The purpose of the plan is to ensure appropriate response to appropriately identified invasive plant species on City property regardless as to department, and to facilitate education surrounding invasive plant species to the broader community in order to reduce the spread of invasive plants onto City managed lands.

The goals of the Plan are to:

- prevent new introductions
- limit the spread of existing populations
- employ strategies that minimize threats to natural areas by removing or reducing the dominance of existing invasive species when possible
- identify opportunities for coordination between city departments and collaboration with outside agencies in order to accomplish these actions

Product

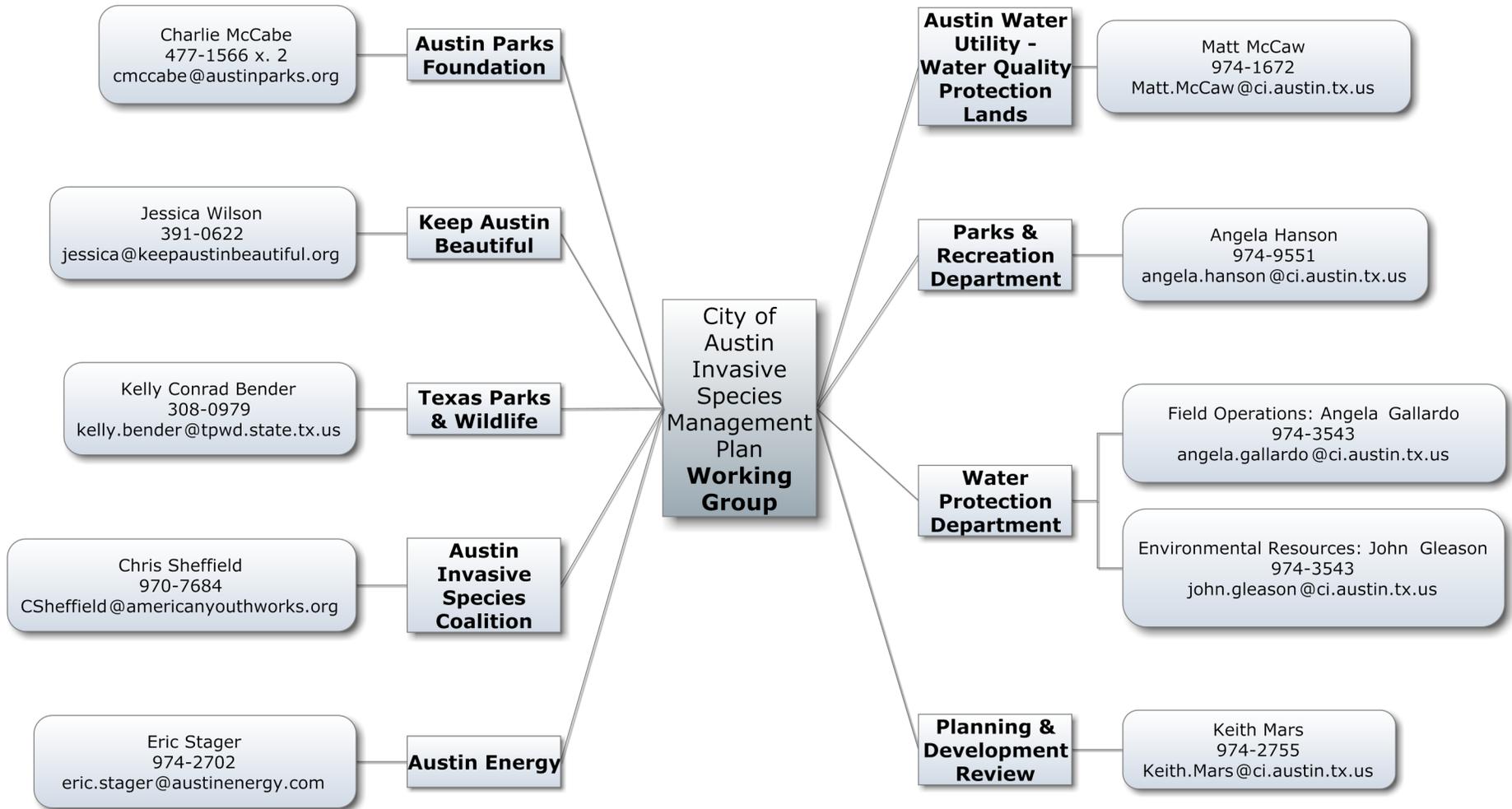
At the end of the development process the City of Austin will have a working document that:

- outlines city-wide protocols for early detection, reporting, action and follow-up
- provides a prioritization system, both by species and by location
- provides guidance on appropriate actions for different landscape types
- identifies the top invaders and outlines recommended treatments
- outlines protocols for placing new species within the prioritization system
- identifies potential funding sources and strategies
- identifies opportunities for education and outreach

Working Group Expectations

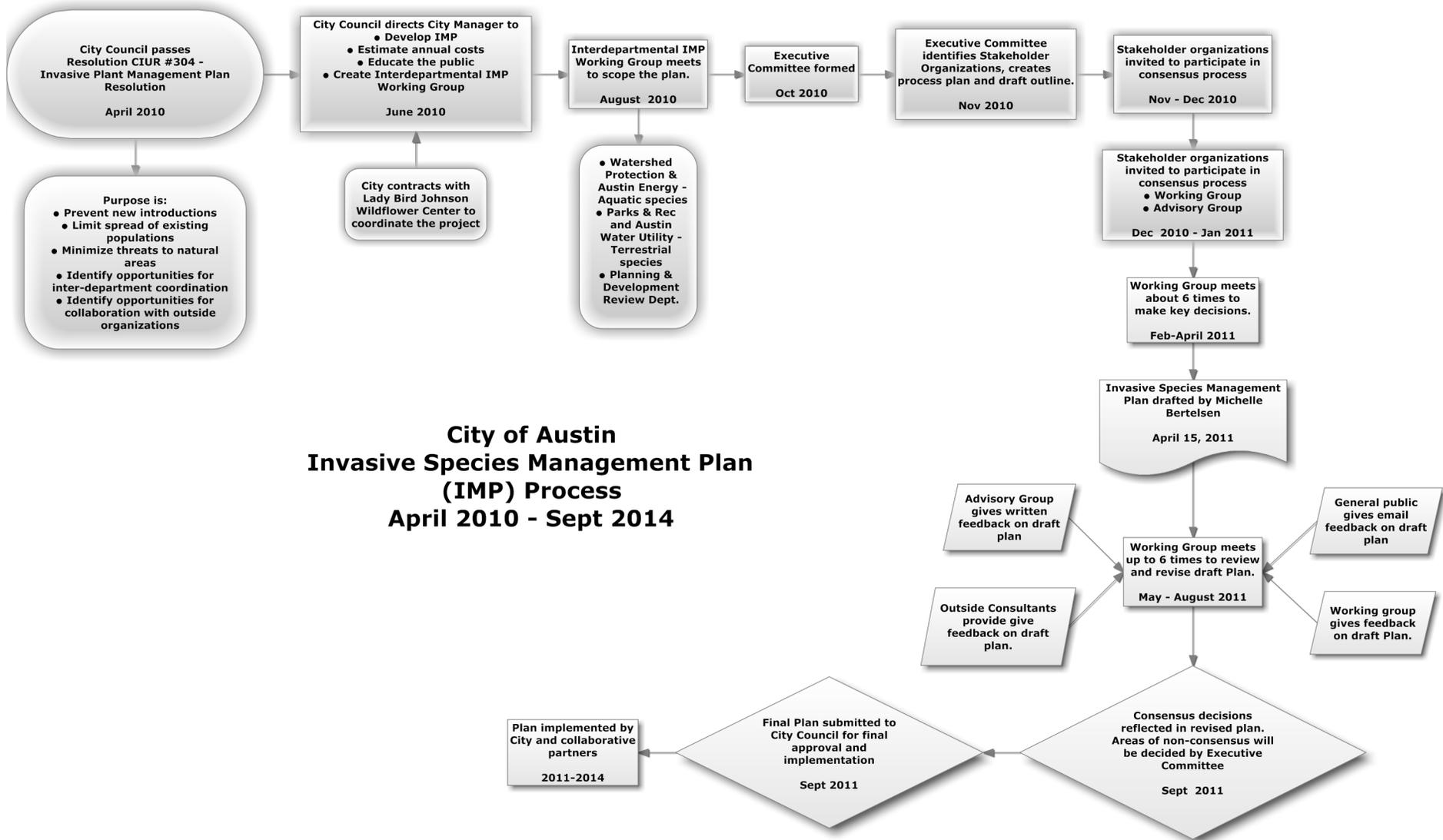
- Once the group has reached consensus on an item, the group will not revisit that item.
- All Members agree to advocate for the consensus decisions of the group with their organizations and the public.
- All Members are encouraged to consult with other Members, the Facilitator and the Project Manager between meetings to ask questions and clarify processes. In some cases the Facilitator or Project Manager will decide that the item needs to go before the entire group for discussion.
- All communication between Members (and Alternates) and the news media will be by agreement of the entire Committee. Members and Alternates agree that they will not speak on behalf of the Committee without explicit permission of the Committee and will be aware of the impact of their public and private comments.
- Anyone may leave the process at any time with no negative consequences, after telling the Committee why they are leaving, and exploring if the group can address any problems that may be the cause of leaving.
- All participants accept the right of the Facilitator to limit the amount of discussion on a specific topic, in order to cover all the needed topics.
- Members may submit an item for the group's agenda to the Project Manager or Facilitator one week in advance of the meeting.
- If both a Member and an Alternate attend a meeting, they will decide which one will speak for the organization at that meeting.

All meetings are open to the public and to members of the Advisory Committee for observation. These observers will not participate in discussions or decision making.

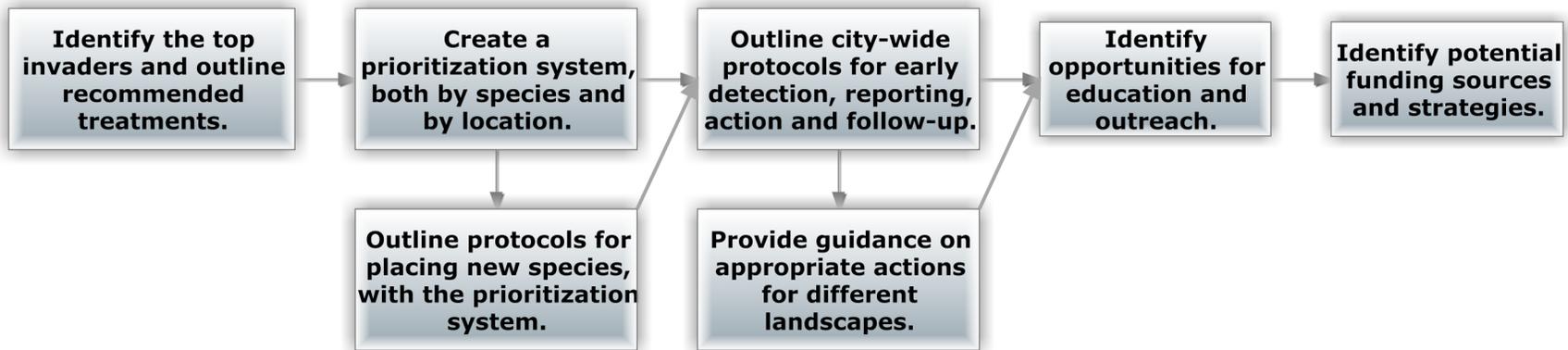


Damon Waitt, dwaitt@wildflower.org, 232-0110
Michelle Bertelsen, mbertelsen@wildflower.org, 232-0171

LBJWC Staff
Matt O'Toole, motoole@wildflower.org, 232-0134
Travis Gallo, tgallo@wildflower.org, 232-0116



Proposed Decision making Sequence for Invasive Species Management Plan Working Group



Dear IMP Executive Committee,

We hope to have a draft Invasive Species Management Plan created sometime in April. In order to meet this deadline, and use the Working Group most effectively, we need to focus their limited time on the most critical questions. We're asking your input on the three most important questions you hope the Working Group can reach consensus on.

Please email me your top three questions by 8:00 a.m. Friday, January 14th. Make your questions as specific as possible. I will send these questions to our facilitator, Juli Fellows, who will look for frequently-mentioned questions on which to focus the first three Working Group meetings.

Mars, Keith [Keith.Mars@ci.austin.tx.us]

1. How are vector sources identified and assessed? Are vectors plant specific?
2. What are the metrics for prioritization? Invasiveness, Limited resources, Lesser plants?
3. What city wide protocols for early detection, reporting, action and follow-up are appropriate and how will activities be coordinated between departments?

Barrera, Rene [Rene.Barrera@ci.austin.tx.us]

1. To what extent is restoration addresses in this plan?*
2. What are the economics of invasive plant management? Cost of management or complete neglect?
3. How can the COA climate initiative be used for invasive plant management (invasive and climate change)?
*Please expand to include how we will restore natural ecological processes, community structure, and natural functional values to maintain ecosystem services.

Gleason, John [john.gleason@ci.austin.tx.us]

1. What city-wide protocols for invasive species eradication are appropriate and how will activities be implemented within and among departments? Related question: Should a specific staff member or group be given ultimate authority over other city departments in regards to invasive species management?
2. How will activities (e.g. eradication, education) & staff be funded? What are the potential costs of such progress?
3. How shall we prioritize species (i.e. which are the worst offenders), locations (i.e. which areas should be addressed first) and resources (i.e. use existing City staff, assemble an interdepartmental committee, integrate with the new Sustainability Office)?

Nance, Alice [Alice.Nance@ci.austin.tx.us]

1. What city wide protocols for early detection, reporting, action and follow-up are appropriate and feasible?
2. How will progress/success be measured?
3. How will activities be prioritized, what constitutes an acceptable level of control and how will these activities be implemented?

Wagner, Staryn [Staryn.Wagner@ci.austin.tx.us]

1. Will there be both chemical and non-chemical methods of plant removal listed for each species of invasive?
2. What method of communication are you going to use to integrate City wide invasive removal?
3. How will it be determined who has overriding authority governing a piece of property?

Gilroy, Mary [mary.gilroy@ci.austin.tx.us]

1. How will City-wide protocols for early detection, reporting, action and follow up be implemented once developed, how will activities be coordinated b/w depts.?

2. What will be the process for including 'new' species/methods in the plan (i.e., how will new control methods be evaluated for inclusion?)
3. How will activities and staff, including education and Citizen Scientist programs be funded?

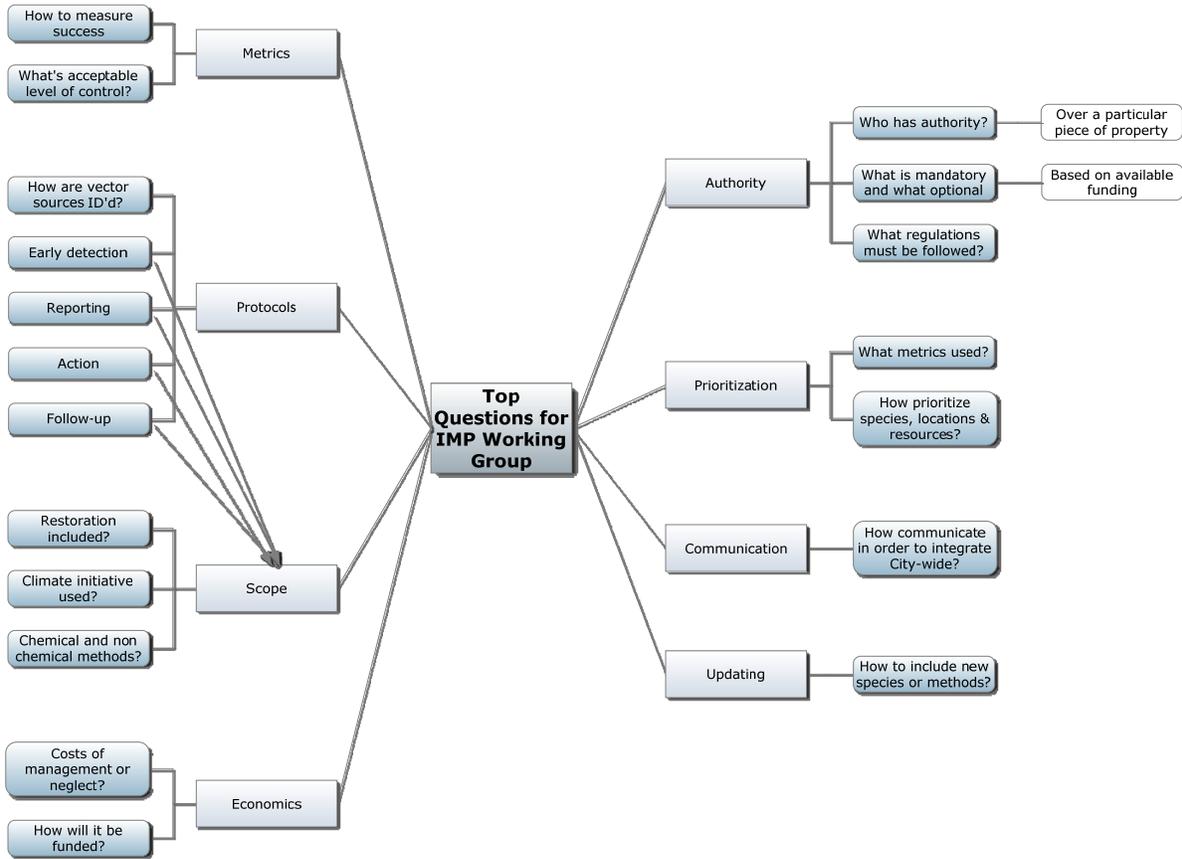
McCaw, Matt [Matt.McCaw@ci.austin.tx.us]

1. Which invasive species will be targeted for management in the IPM plan?
2. How will source populations be prioritized for treatment? By species? By size of population? By location relative to sensitive sites?
3. Among the management strategies available to departments, which will be mandatory and which will be optional based on available funding?
4. And this isn't something that will require consensus, but it's something I think is critical to clarify in the IPM:

What are the regulations regarding the use of herbicides on City-owned sites (both open and closed to the public) as they apply to commercial applicators, contractors, city staff, and volunteers?

- a. Training
- b. Licensing of applicators
- c. Regulation status of herbicides
- d. Storage of herbicides
- e. Documentation of herbicide application
- f. PPE
- g. Re-entry times / public access to treated sites

Input from Seven Executive Committee Members



Invasive Species Management Plan Working Group

February 28, 2011 Meeting

Meeting Goals

1. Agree on a definition of invasive species to be used in the Plan. (Using an existing definition if possible.)
2. Agree on a small number of specific, measurable, achievable goals we hope approval and implementation of the Plan will achieve in the next five years. .
3. Examine data from the “top invaders” spread sheet. Look for areas of agreement and disagreement.

Agenda

11:00 Meeting overview, introductions

11:05 Review meeting notes from 2/10/11 – any changes?

11:10 Examine several potential definitions of invasive species (Federal and state?) Are either of these adequate for our purposes? Seek agreement.

11:30 Small group Conversation Cafés

In groups of 5-6, members will have a dialogue about “What changes would you most hope to see as a result of having this plan if no additional resources were allocated to its’ implementation?” The goal of these conversations is not to reach consensus but to fully understand your own and the perspectives of others.

12:00 Lunch break

12:15 SMART goal setting

Imagine that it is 2016 and you’re still happily connected to the IMP Plan. You’ve been asked to vote yes or no on whether or not you believe the Plan has made outstanding progress in the past five years in achieving its shared goals. You can only look at THREE pieces of information in order to base your vote. The information can be quantitative or qualitative. Be as specific as you can. Write one piece of information on each of the 3 sticky notes you received.

Members will share their sticky notes, put them in categories and select 3-5 categories for SMART goal setting. The group will seek consensus on the SMART goal for each category.

1:15 Stretch break

1:20 Continue work on SMART goals.

2:00 Look at data from the group about the “top invaders” spread sheet. Begin to understand the sources of difference in views.

2:55 Evaluate the meeting

3:00 Adjourn

Template for "Top Offenders" spreadsheet

Species	Abundance	Virulence, Invasive Potential	Difficulty to Manage	Potential Purpose Served	Landscape Type
Bamboo (running)		High	High		Uplands, Riparian
Bastard cabbage		?	High		Uplands
Bermuda grass		?	High		Uplands, Riparian
Blue stem KR		High	High		Uplands, Riparian
Cat claw		Low	Med		Uplands, Riparian
Chinaberry		Med	Med		Uplands, Riparian
Chinese parasol		Low	Low		Uplands
Chinese pistach		Low	Low		Uplands
Elephant ear		Med	Med		Instream
Giant cane		High	High		Uplands, Riparian
Hollyfern		Low	Med		Riparian
Hydrilla		High	High		Instream
Japanese honeysuckle		Med	Med		Uplands, Riparian
Johnson grass		Med	Med		Uplands
Kudzu		Low	Low		Uplands
Ligustrum (3)		High	Med		Uplands, Riparian
Malta star thistle		High	High		Uplands
Nandina		High	Med		Uplands, Riparian
Paper mulberry		High	Med		Uplands
Pyracantha		Med	Med		Riparian
Salt cedar		Low	Med		Uplands, Riparian
Tallow		High	Med		Uplands, Riparian
Tree of heaven		High	High		Uplands
Water hyacinth		Low	High		Instream

Invasive Species Management Plan Working Group

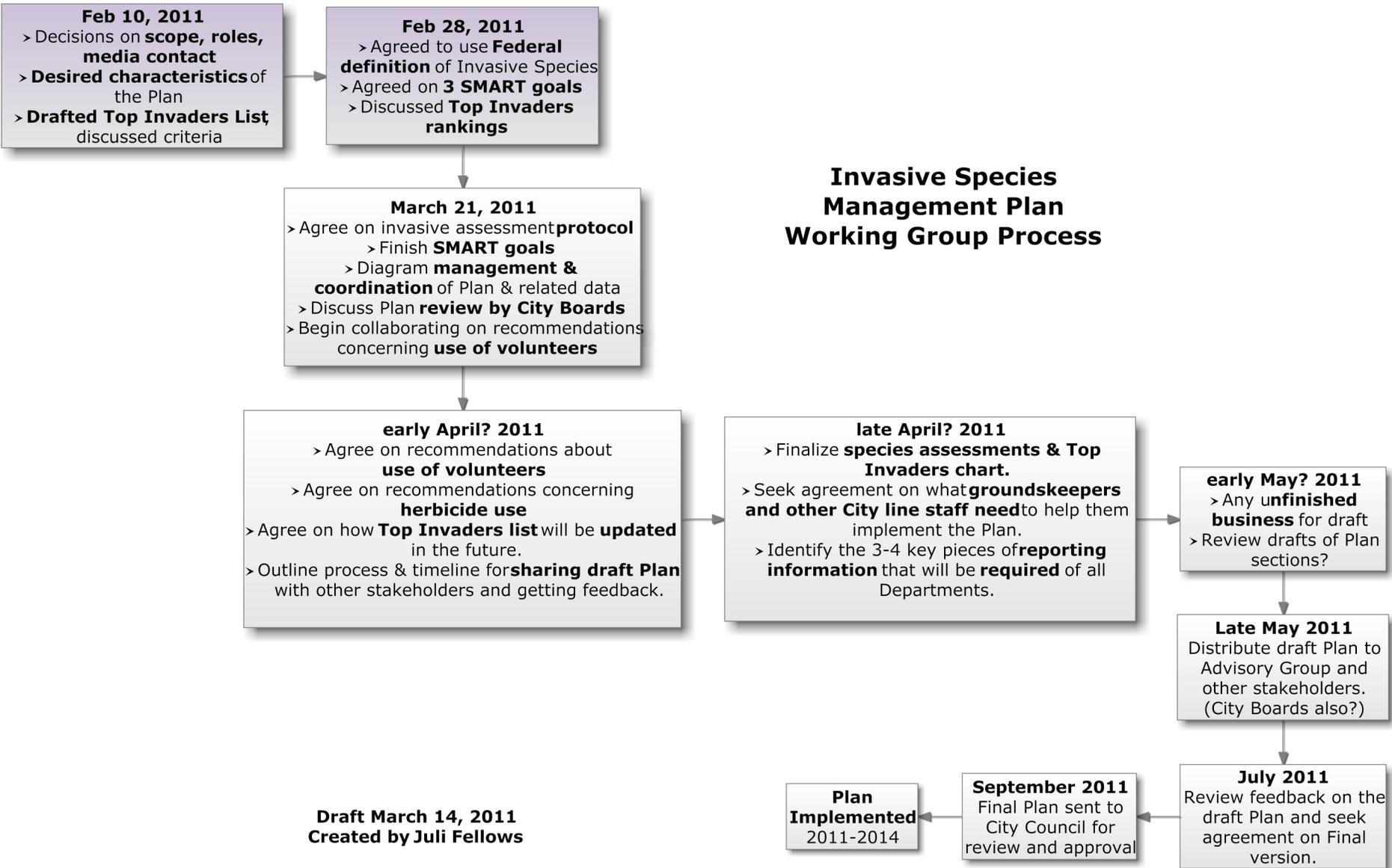
March 21, 2011 Meeting

Meeting Goals

1. Agree on which of two invasive assessment protocols to use for ranking species in our Top Invaders list.
2. Finish work on the SMART goals.
3. Construct a diagram of how the Plan will be coordinated and managed, with lines of authority.
4. Share information about required Board approvals and discuss strategy for bringing them up to speed.
5. Begin collaborating on recommendations concerning use of volunteers.

Agenda

- 11:00 Meeting overview
Review meeting notes from 2/28/11 – any changes?
Review action items from 2/28
- 11:10 Review of invasive assessment protocols available for our use and pros and cons of each – Damon (California Invasive Plant protocol or PHELOUNG)
- 11:20 Seek consensus on which protocol to use
- 11:30 Review three SMART goals agreed to on Feb 28th.
Identify interests related to the goal concerning standardization of Department procedures.
Brainstorm options for the SMART goal. Seek consensus on one or more options.
- 12:00 Get lunch (working lunch)
- 12:15 Finish work on SMART goal
- 12:30 Plan coordination and management
Two small groups draw a diagram of how the Plan might be coordinated and managed, with lines of authority shown. Include in this diagram, information about how and to whom data will flow.
- 1:00 Compare the two diagrams. Seek consensus on a diagram and bullet points about coordination and management of the Plan and related data.
- 1:45 Break
- 1:55 Angela shares information about required City Board(s) approval. Brainstorm ways to bring those groups up to speed. Create action items for keeping the Boards informed.
- 2:20 Identify interests related to use of volunteers for this Plan.
- 2:30 Begin to brainstorm options for using volunteers for this Plan.
- 2:55 Evaluate the meeting
- 3:00 Adjourn



Draft March 14, 2011
Created by Juli Fellows

Invasive Species Management Plan Working Group

April 4, 2011 Meeting

Meeting Goals

1. Agree on recommendations concerning use of volunteers.
2. Explore the policies concerning herbicide use among the Departments. Identify differences and interests related to herbicide use and seek agreement on recommendations.
3. Get briefed on Weed Information Management Systems and discuss the implications for data collection.
4. Review the draft Plan outline and other documents created by LBJWC staff.

Agenda

11:00 Meeting overview

Review meeting notes from 3/21/11 – any changes?

Review action items from 3/21

11:10 Review work done on 3/21 concerning interests and options for use of volunteers. Add any interests or options. Seek agreement on recommendations that meet the interests.

12:00 Get lunch (working lunch)

12:15 Each Department describes highlights of its policies concerning herbicide use. (1-2 minutes each)

Identify points of similarity and of difference.

Identify interests and brainstorm options for recommendations concerning use of herbicides.

1:15 Update on Weed Information Management Systems – Damon Waitt

1:25 Break

1:55 Implications of Damon's presentation for our data collection

2:20 Review the draft Plan outline and other documents

2:55 Evaluate the meeting

3:00 Adjourn

Invasive Species Management Plan Working Group

April 18, 2011 Meeting

Meeting Goals

1. Review implications of using US Fish and Wildlife endangered species document (White 2007) in its entirety and decide whether or not to change that recommendation.
2. Identify the key pieces of reporting information that will be required of all Departments.
3. Review and finalize the briefing slides for the city Boards. Confirm schedule and who will attend.
4. Seek consensus on priority ranking within the Top 20 based on assessment criteria.
5. Discuss what groundskeepers and City line staff need to help them implement the Plan.

Agenda

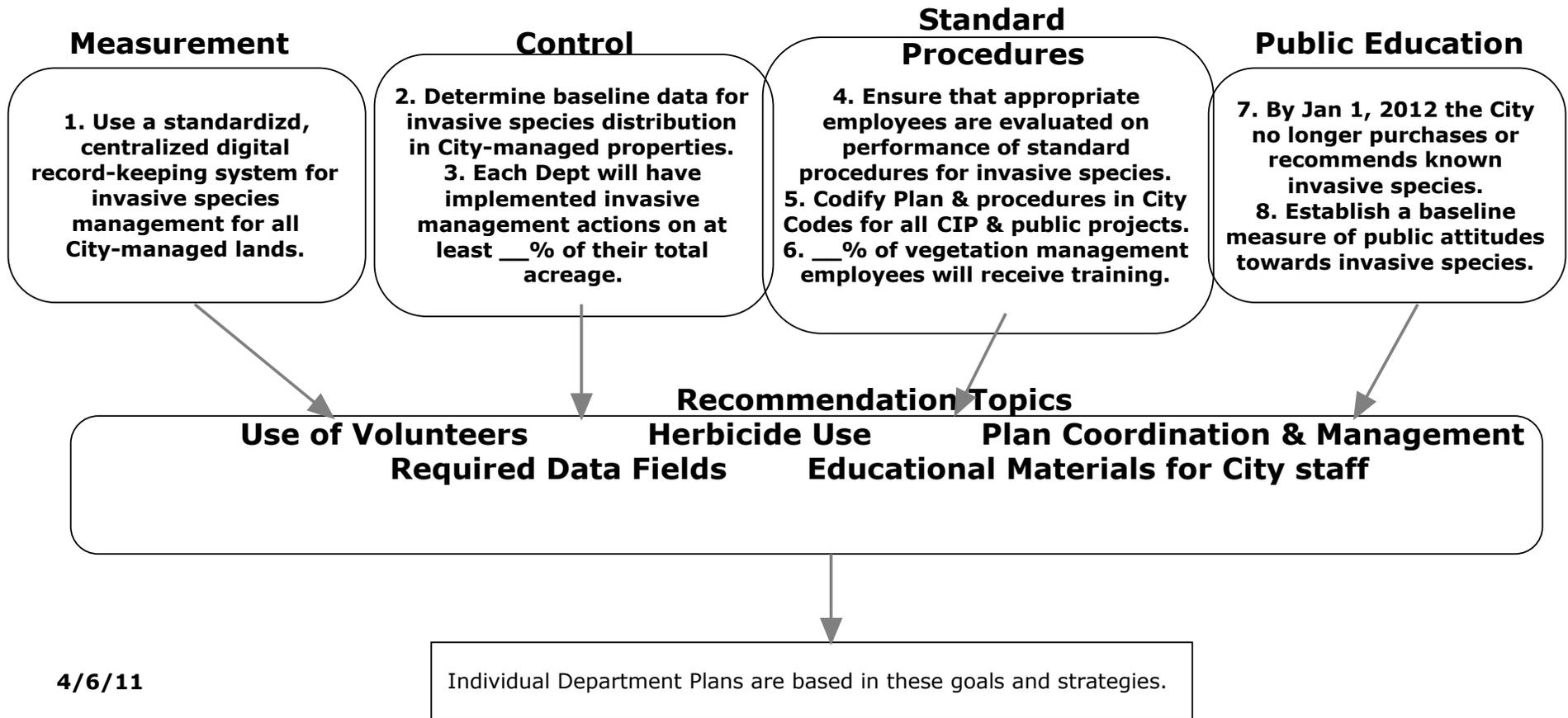
- 11:00 Meeting overview
Review meeting notes from 4/4/11 – any changes?
Review action items from 4/4
- 11:10 Concerns about using USFW document in its entirety – Matt McCaw
Seek agreement on whether or not to change the recommendation.
- 11:30 Key reporting information
Look at Angela G's work and Travis's data fields. Agree on key pieces of data that will be required from all Departments in the centralized, standardized Invasive Species Management system.
- 12:00 Get lunch (working lunch)
- 12:20 Look at Matt's briefing slides – give feedback.
Review schedule of who will attend which Board briefing
- 12:40 Review chosen criteria for Assessment of Invasive Species (Damon or Travis)
- 1:25 Break
- 1:35 Connect Assessment Criteria to COA Prioritization of Top 20 Invasive Species (Damon or Travis.)
Seek consensus on priorities within the Top 20 list.
- 2:15 Discuss what line staff need to help them implement the Plan
- 2:55 Evaluate the meeting
- 3:00 Adjourn

City of Austin Invasive Species Management Plan - One Page Summary

Purpose of the Plan (Resolution 20100408-030)

Invasive species influence the productivity, value & management of a broad range of land & water resources in Austin. They have significant negative impacts including economic, social and ecological impacts. Therefore the City Manager is directed to develop an Invasive Species Management Plan for the control and/or eradication of undesirable aquatic and terrestrial species.

2016 SMART GOALS



4/6/11

Invasive Species Management Plan Working Group
 May 16, 2011 Meeting

Meeting Goals

1. Decide on at least temporary targets for SMART goals #3 and #6 (actions on what percent of acreage and what percent of vegetation management employees trained - by 2016.)
2. Brainstorm a list of specific negative impacts the Departments have seen due to lack of management of invasive species. Brainstorm a list of situations where lack of a coordinated citywide Plan has caused problems, duplication, or inefficiencies. (For use in writing the justification sections.)
3. Hear a proposal from Charlie, Angela and Matt on data fields for the centralized database and make a recommendation.
4. Look at a demo of the prototype Weed Management System (Eradicator Calculator) and give feedback.
5. Review the overall process and where we are. Finalize the list of organizations that will be invited to review the draft Plan.
6. Decide whether or not to make a recommendation about herbicide toxicity, based on the USFWS table.
7. Review Fact Sheets and/or other documents created since the April 18th meeting.
8. If all 20 assessments are completed, review the rankings for the top 20 species and explore if the group wants to set priorities within the Top 20.

Agenda

- 11:00 Meeting overview
 Review meeting notes from 4/18/11 – any changes?
 Review action items from 4/18
- 11:10 Seek agreement on at least temporary targets for goals #3 and #6.
- 11:40 Brainstorm specific negative impacts of invasive species in Austin
- 11:55 Brainstorm situations where lack of city-wide coordination has caused problems, etc.
- 12:10 Get lunch
- 12:30 Hear proposal on data fields for centralized database (Angela, Matt) and give feedback
- 12:25 See a demonstration of the “Eradicator Calculator” (Damon) and give feedback
- 12:45 Review the overall process and where we are in that process (Matt O)
 Finalize the list of organizations that will be invited to comment on the draft Plan.
- 12:55 Decide whether or not to make a recommendation concerning herbicide toxicity, referencing the USFWS toxicity table (White, 2007)
- 1:25 Break

- 1:40 Review fact sheets and/or other documents created since April 18th and give feedback.
- 2:20 If all 20 assessments are done, review the rankings. (Travis) Decide if the group wants to set priorities within the Top 20.
- 2:50 Evaluate the meeting
- 3:00 Adjourn

DRAFT

City of Austin, Executive Meeting #1 – Meeting Notes

Invasive Plant Species Management Plan

Date: 10/18/2010

Location:

Austin Parks & Recreation Department- Conference Room

200 South Lamar

Austin, Texas 78704

(512) 974-6700

Attendees:

City of Austin: Alice Nance (COA SPOC), Angela Gallardo, Denise Delaney, Emily King, Eric Stager, John Gleason, Keith Mars, Margaret Russell, Mary Gilroy, Matt McCaw, Rene Barrera, Roxanne Jackson, Staryn Wagner, Walter Passmore

LBJWC: Matthew O'Toole (Project Manager), Damon Waitt, Matthew O'Toole (Project Manager), Michelle Bertlesen, Steve Windhager, Travis Gallo

Goals and Purpose:

- Provide a guideline for city agencies and its projects (avoidance & preferences)

Resources: (to be added or investigated)

- Mary - Hydrilla Management Plan (2000-2001)
- Denise – Invasive Field Guide (35 Species)
- Travis – AustinInvasive.org, National Fish and Wildlife Federation (county wide cooperative weed management)
- Rene –Kalmbach & Zickler Thesis (Texas State)
- Keith – No mitigation for removal, development review
- Grow Green Guide
- John – IPM, Austin Energy & Parks and Rec.
- Rene – Austin Least Wanted (PARD Inventory)
- Emily – Animal Management Plan, Re-growth Study

Case Studies

- No comments

Roadmap (Critical Questions):

- What are the levels of invasiveness? Is there a hierarchy of invasiveness? So we need to clarify the extent of invasive plants?
- Questions:
 - How are vector sources identified and assessed? Are the vectors plant specific?
 - Does the plan address aquatic and terrestrial plants? Does it include animals?
 - How do we approach native invasive versus non-native invasive plants? What are the differences in regards to WQPL and General COA lands?
 - What is the plan to deal with native species that become invasive? Especially, those that invade prairie ecosystem?
 - To what extent is restoration addresses in this plan?
 - What is the protocol for revisiting and monitoring treated sites? How do we reevaluate those sites? How does adaptive management relate to this plan?
 - Can the plan identify proper terminology for invasive plant related items?
 - What are the acceptable methods of removal and control?
 - Are there different methods based on landscape type? What are those methods?

- How do we address pathways and control vectors? (bulkheads, edge plantings, quality of planting) Are there weed free sources?
- What are the economics of invasive plant management? Cost of management or complete neglect?
- How can the COA climate initiative be used for invasive plant management (invasive and climate change)?
- What does inventory data of invasive species provide, especially a limited database?
- Are grass species included in this management plan? Cultivars?
- What are the metrics for prioritization? Invasiveness, Limited resources, Lesser plants?
- What is the availability of local ecotype species for restoration?

Outline (Draft)

- Identify stakeholder group in details.
- What are the control measures of this plan? How do we decide control, especially with specific plants in different landscapes?
- Does this plan need to address applicable laws, regulations, licensing (state law)?
- Can the plan provide the top 20 case studies of problematic plants?
- How can the city plan influence the management of privately owned lands? How can development be regulated?
- What are the vectors that affect COA managed lands and adjacent properties (volunteer)? What are the sustainable models that exhibit cooperation and collaboration? Are there incentives for mitigation?
- Council created, accountability group beyond committee group (10 year goal)
- Who is the contact for media for media relations? Product rollout, outreach, public issues?
- What departments are missing?
- How can the process garnering support from other initiatives and comprehensive plans?

Stakeholders

- Who are the outside/community organizations? Invitations are extended to organizations, not individuals.
- Will the stakeholder process allow written feedback from public individuals / general public?
- Will the stakeholder process follow the consensus or dynamic governance model?
- Concerns: Will this win city approval? Will this be perceived as a community plan? Will this be perceived as a landscape ordinance? Who promotes ownership of this plan... committee designee or department heads?
- Can we define a product framework for stakeholders?
- Selection of participants:
 - Public works
 - Planning, Development, and Review
 - State Agencies (LCRA, TNLA, PEC, Brazos River Authority, TCEQ, UT, TXDOT)
 - Other Organizations (Citizens Groups, Blum Creek Partnership, Bull Creek Foundation)

City of Austin, Executive Meeting #2 – Meeting Notes

Invasive Plant Species Management Plan

Date: 11/15/2010

Location:

One Texas Center
505 Barton Springs Road
Austin, TX 78704

Attendees:

City of Austin: Alice Nance (COA SPOC), Emily King, Eric Stager, John Gleason, Keith Mars, Mary Gilroy, Matt McCaw, Roxanne Jackson, Staryn Wagner

LBJWC: Matthew O'Toole (Project Manager), Damon Waitt, Michelle Bertlesen, Steve Windhager, Travis Gallo

Outline (Draft)

- Why would a plan remove a species from listing?
- Address vector / pathway management specific to Austin.
- Create or address protocol for collaboration and coordination; a process for recommending or accepting those ventures.
- Early detection and rapid response should be joined.
- Is there a difference between restoration and rehabilitation (control and replanting)?
- Animal Management? Recommend focusing on plants; provide a framework for the adaption of animals to the Plan.

Stakeholders

- Structure of Stakeholder Group:
 - Model: designated slots (each organization), designate representatives; working/advisory Group (Written Comments), consensus agreed!
 - Working Group: 15-20 participants, critical organizations
- Top 5 Organizations:
 - Staryn: Keep Austin Beautiful (KAB), Neighborhood Assoc. (NA), TNLA, TPWD, LCRA
 - McCaw: Austin Parks Foundation (APF), KAB, LCRA, TXDOT, TNLA, AISD
 - Keith: TNLA, NA, USFWS, TPWD, KAB
 - Alice: Austin Invasive Coalition (AIC), NA, KAB, APF, TISCC
 - Emily: KAB, APF, TFS, AIC, TNLA
 - Roxanne: KAB, AIC, TNLA, TISCC
 - Eric: TNLA, APF, KAB, TPWD, TFS
 - Jon: TNLA, AISD, AIC, TXDOT, APF, KAB
 - Mary: KAB, TNLA, TISCC, APF, LCRA
- **Working List:** Keep Austin Beautiful (KAB), Austin Parks Foundation (APF), Texas Nursery and Landscape Association (TNLA), Neighborhood Association (NA), Austin Invasive Coalition (AIC), Texas Forest Service (TFS), Texas Parks & Wildlife (TPWD), Texas Department of Agriculture (TDA) (Applicators Department), COA Departments
- **Advisory List:** LCRA, TXDOT, USFWS (10A Permit), TNC, Hill Country Conservancy, TSUS, EPPBA

Future Events / Issues

- Draft Invitation Letters
- Schedule January Meeting
- Propose Advisory Group
- Public Comment?, Website, Alice
- Sensitivity of FTP Site, Document, Draft Watermark

Invasive Species Management Plan Working Group

February 10, 2011 Meeting Notes

Executive Summary

Nine members of the Invasive Species Management Plan (IMP) Working Group and four Wildflower Center staff met in a facilitated meeting to kick off this phase of the project. They began by introducing themselves and talking about the experiences and skills each brought to the project (page three). The group reviewed the scope of the project, timelines and agreed to the member guidelines. They talked about their hopes and fears for the Plan and, from that, agreed on a set of desired characteristics they wanted in the Plan (page four).

The group reached consensus on a number of decisions, including about media contact, role of Wildflower Center staff and others, aspects of the definition of invasive species and scope of the project. See page two for a list of these decisions.

The group identified three types of landscape – uplands, riparian and instream – and began identifying the “top offenders” based on their experience with these landscapes. This is a work in progress but a preliminary diagram is show on page four. They also listed species that they weren’t sure about or that might be on a list of “secondary” offenders (page four).

The group discussed variables that might go into a priority ranking for species. These included abundance, virulence, invasive potential and difficulty to manage. A spreadsheet will be drafted which might be useful to the group and which will also include possible uses served by the species and landscape type (page five).

They discussed a flow chart of decisions to be made by the group and acknowledged that many of the early tasks may be made in a more or less simultaneous manner. Discussion of opportunities for education and outreach and possible funding strategies will be done after priorities are set and protocols developed.

The group agreed to meet one more time in February, twice in March and once in early April, in order to maximize the chances of meeting the April 15, 2011 deadline for the first draft of the Plan. Homework action items are shown below.

Who	What	When
Angela G	Send maps showing areas of authority of your Department, and/or coverage and species, to Matt O’Toole. Also data for Public Works Department.	Before next meeting
Angela H	Research with the City Clerk’s office if after we’ve revised the Plan, does it need to be approved by any other Boards, e.g. the Environmental Board or the Open Forestry Board.	Before next meeting
Angela H.	Send maps showing areas of authority of your Department, and/or coverage and species, to Matt O’Toole	Before next meeting
Eric	Send maps showing areas of authority of your Department, and/or coverage and species, to Matt O’Toole	Before next meeting
Everyone	If you have GIS data relevant to this process, send it to Matt O’Toole.	2/24/11
Everyone	Send any documents you want to share with the group, send them to Matt O’Toole for posting on the web page.	Ongoing
Everyone	Send any IPM Plans you have to Matt O’Toole.	Before next meeting
Travis	Share IPM guides for volunteers with group via web page.	2/24/11
Travis	Share research on Giant Cane (arundo) with group via web page.	Before next meeting

Consensus Decisions Made February 10, 2011

Media Contact

- The point of contact for this process for the media will be Angela H. Wildflower Center staff can help Angela when needed. Other members are free to acknowledge the process and their involvement. If a lot of detail is needed, refer the media contact to Angela H. When Angela talks to the media she will speak about the process, goals and purpose but will not share specific details of the content of the Plan. The group would like to make a plan for proactive media contact to spread word about the draft Plan and encourage input.

Wildflower Center Role

- The Wildflower Center staff are resources to the group and will participate fully in discussions. They will not, however, participate in decision making.
- The Wildflower Center won't have a comprehensive map of invasive species throughout these properties but hope to have a structure in place for that mapping.

Aspects of the Definition of Invasive Species

- We mean only exotic species.
- Don't recreate our own definitions when there are useful ones already available, e.g. from the federal or state level. Using a federal definition might be useful so our work can carry upwards.

Scope of the Plan

- Protocols will specify any mandated actions or recommended/encouraged actions.
- Riparian areas within the Full Purpose Jurisdiction are managed by the City (they aren't on the big map now). Powerline right-of-ways and transmission lines RoW are also managed by the City.
- There is some land jointly managed by the City and Austin Independent School District. These are schools with an associated park (may show up on maps as parks.)
- We can make suggestions for restoration but the Plan will not give specific guidelines or protocols for this.
- Only plant species will be included in this Plan.

Roles

- The City Manager will have implementation authority after the Wildflower Center contract ends. Might the Sustainability Office have a role in the future?
- If we learn that other Boards will need to approve the Final Plan before it goes to Council, get them on the Advisory Board to comment on the draft Plan.

What We Bring to the Group

John Gleason – experience in stream bank stabilization, native landscapes, integrated pest management.

Jessica Wilson – working with volunteers, bridging the gap between what they want to do and what’s allowed.

Keith Mars – background in biology, forestry. Experience in invasive species management and their biology.

Matt McCaw – wildland conservation, ecology and restoration. Our programs have IMP plans in place, we have experience “on the ground”.

Chris Sheffield – conservation work program, we contract out our teams of youth and adults. Injecting education into work projects.

Angela Gallardo – data collection and coordination. We’re working on a Watershed Master Plan which will include invasive species.

Eric Stager – aquatic vegetation management, IPM for transmission lines and power plants, endangered species and environmental assessments.

Angela Hanson – urban forestry with preserves, implementation aspects of invasive species management, ecology, restoration, invasive species planning.

Damon Waitt – invasive species work at local, state and national levels, building alliances.

Charlie McCabe – obsessed with invasive species. We focus on education and working with volunteers.

Travis Gallo– citizen scientist program where volunteers map invasive species, do early detection.

Matt O’Toole – environmental designer, resource management, restoration, water management, the nuts and bolts of projects.

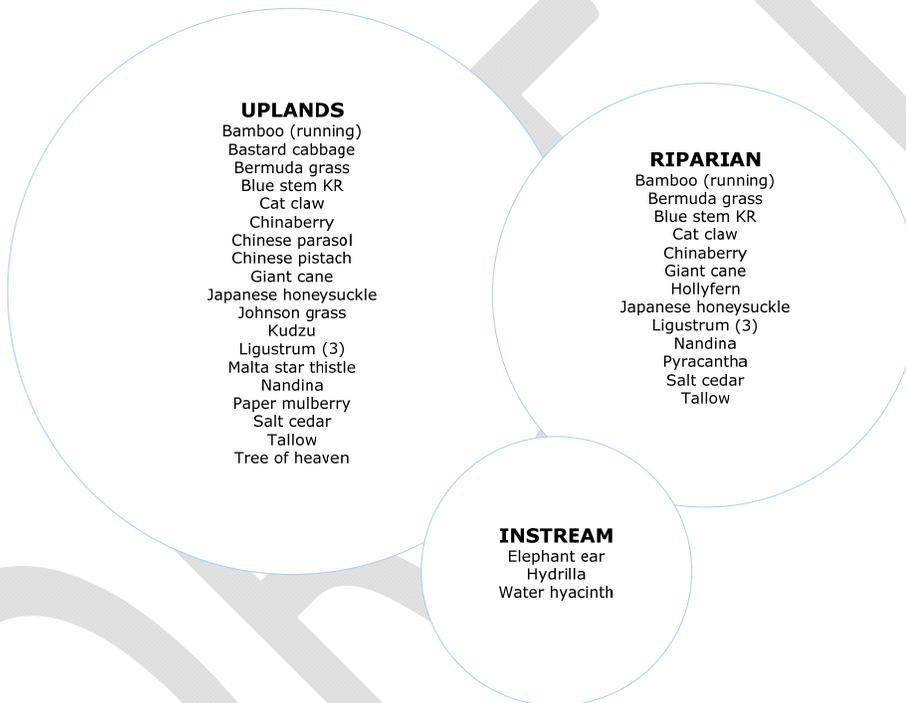
Melanie ___– (intern) helping Matt O’Toole, experience in environmental consulting and horticulture.

Michelle Bertelsen– ecology and land management on the ground. I’ll be pulling together the background information.

Hopes for the Plan	Fears about the Plan
<ul style="list-style-type: none"> • That we get the money to fund it. • It creates greater education and public awareness. • It promotes involvement, engagement of the public. • It trickles from the top through the city departments all the way to grounds crews. • Volunteers are allowed to do a lot (perhaps with training.) • Other cities, agencies or counties jump on board. • The plan will facilitate management within and between Departments, facilitate collaboration. • We will have buy-in from groups that could be adversarial to the Plan. • It will raise awareness among non-natural resource Departments and staff, e.g. maintenance. • A position will come out of this to coordinate implementation and updating of the Plan. 	<ul style="list-style-type: none"> • We won’t get the money to fund it. • What volunteers are currently doing will be restricted. • It gets watered down when it goes to Council. • We’ll have incomplete or varied implementation across Departments because they have differing priorities or understanding of the issues. • The information is spun to appear that the group is AGAINST trees rather than FOR native diversity. • All goes right and we get the money and in various parks the mono-species are removed with no plan for repairing it and we have to go through the cycle all over again. • The Plan will be static and won’t be updated as new species come in.

Desired Characteristics of the Plan

- **Clear and concise**
- Includes **scientific information** but in ways that **are understandable** to people who aren't experts.
- Appeals to **popular reasons** for supporting this, e.g. beauty
- Provides **economic, social and environmental justifications** for the Plan.
- Includes **specific actions required**
- Is apolitical and **objective** (supported by research)
- **Comprehensive enough** that all Departments can see how they fit in
- Is based in a **good understanding of the existing plans** – we look for ways to build on those and also for opportunities for improvement. We are aware of actions that might contradict existing plans.
- It's **affordable**
- It **represents those who do a great amount of work** on public lands – hear their input and reflect their needs and limitations.



Working List of "Top Offenders" by type of landscape

Species about which we aren't certain or that might be "secondary" offenders

- Brazilian vervian
- Ruellia
- English ivy
- Vitex
- Asian jasmine
- Trifoliate orange
- Mulberry – paper and another kind
- Black locust?
- Oleander?
- Drake elm
- Chinese elm
- Siberian elm
- Bermuda grass
- Loquat

Other Discussion Notes

- We don't have good management plans for all species.
- Some plans are only oriented for small-scale efforts.
- Might we address restoration by tying in recommendations for preventing re-infestation?

Discussion of Criteria for “top offenders” (not decisions)

- Nature serve has one model
- The Texas Parks and Wildlife has a Weed Risk Assessment - pheloung
- Some models rank species hi, med and low based on economic damage, etc. This ranking would have no legal authority in Texas.
- Examine what species are preventing the Departments from reaching their management goals.
- Use a categorical approach.
- List the species alphabetically and perhaps have a matrix by columns. Then chapters about management.
- We need ways to assess the effectiveness of the Plan.
- We could consider it invasive if it’s considered invasive somewhere else (by a credible institution).
- Is it possible to eradicate or should our goal be just management?
- Group species by management, minor annoyances, early detection.

Possible Template for Spreadsheet of “Top Offenders”

Species	Abundance	Virulence	Invasive Potential	Difficulty to Manage	Potential Purpose Served	Landscape Type
Bamboo (running)						
Bastard cabbage						
Bermuda grass						
Blue stem KR						
Cat claw						
Chinaberry						
Chinese parasol						
Chinese pistach						
Elephant ear						
Giant cane						
Hollyfern						
Hydrilla						
Japanese honeysuckle						
Johnson grass						
Kudzu						
Ligustrum (3)						
Malta star thistle						
Nandina						
Paper mulberry						
Pyracantha						
Salt cedar						
Tallow						
Tree of heaven						
Water hyacinth						

Scheduling Future Meetings

1. Jessica will send Matt O'Toole conference room availability at her facility. The address is 55 N. IH 35 but don't look for it on Google. It's in the ExtendaCare building on the corner of Lambie and IH 35 (2 story building.)
2. The group agrees that either Angela H or her alternate (Walter Passmore?) need to be at every meeting.
3. Matt will send out a Doodle calendar request the morning of 2/11. The group will respond for themselves and/or their alternate by 5:00 p.m. on 2/11.
4. The group will have one more 4-hour meeting in February, two in March and one in early April.
5. The group will meet from 11:00 am to 3:00 p.m. unless they decide otherwise.

Meeting Evaluation

What We Liked	What We Would Change
Juli's facilitation	Having it during lunch, no lunch was provided.
The meeting didn't seem long.	Have the web page projected onto a screen for reference to available documents.
The chocolate	More examples of what we're going to talk about (do our homework)
Good discussion, dialogue	Have a bigger meeting room
There was more consensus that I thought we'd have	

Attendees:

Working Group Members

John Gleason
 Jessica Wilson
 Keith Mars
 Matt McCaw
 Chris Sheffield

Angela Gallardo
 Eric Stager
 Angela Hanson
 Charlie McCabe

Wildflower Center staff

Damon Waitt
 Travis Gallo
 Matt O'Toole

Melanie ____
 Michelle Bertelsen

Facilitator

Juli Fellows

Invasive Species Management Plan Working Group

February 28, 2011 Meeting Notes

Executive Summary

All ten members of the Invasive Species Management Plan (IMP) Working Group, four Wildflower Center staff and their intern, attended the second meeting of the Invasive Species Management Plan Working Group, hosted by Keep Austin Beautiful. The meeting goals were: 1) to agree on a definition of invasive species for the Plan, 2) to agree on a small number of specific, measurable, attainable goals for the Plan's implementation in 5 years, and 3) to look at the top invaders chart and find areas of agreement and disagreement.

The group all agreed to use the Federal definition of invasive species for the Plan. Before working on the specific measurable goals, small groups used the Conversation Café method to talk about what changes they would most hope to see as a result of having this plan, if no additional resources were allocated to its implementation. Based on their own views and what they heard in the small groups, they began work on the measurable goals.

Measurement/Implementation

- ✓ By 2016, a standardized, centralized digital record-keeping system for invasive species management and control is used by for all City-managed lands.

Invasive Species Control

- ✓ Determine the baseline data for invasive species distribution in City-managed properties.
- ✓ By 2016, each City Department will have implemented treatment plans for a reduction of the distribution from baseline. The Departments will set their own goals for reduction and all will meet a defined minimum standard. This can include volunteer efforts.

Public Education

- ✓ By 2016, the City no longer purchases known invasive species.
- ✓ By 2016, there will be a baseline measure of public attitudes towards invasive species.

The group will continue to work on the goals, including a fourth goal concerning standardization of Department procedures.

The group reviewed a first draft of the "top offenders" chart, completed by LBJWC staff based on their knowledge of the City properties. They discussed definitions of some of the terms used in the chart (page three). They identified fifteen cells that they wanted to discuss further (indicated by the pink highlighting on page four).

The next meeting will be held in the Keep Austin Beautiful conference room and the date will be determined through a Doodle.com poll of the members.

Action Items

Who	What	When
Matt	Send the group examples of mapping systems	by next meeting
Angela H	Follow-up with City Clerk's office about whether the Plan must be approved by any other City Board	ASAP
Angela H	Resend the maps showing areas of authority and/or coverage and species to Matt O'Toole.	Before next meeting
John G.	Send any IPM plans you have to Matt O'Toole	Before next meeting
Travis	Share IPM guides for volunteers, and research on Giant Cane , to group members via the web page	3/2/11

Consensus Decisions Made February 10, 2011

- ✓ The February 10th meeting notes were approved without change.
- ✓ The Federal definition of invasive species was adopted by the group. One reason for choosing this definition is that it might be an advantage if seeking federal funding in the future. Other discussion on this point is noted below.
- ✓ The goals for measurement, invasive species control and public education were agreed on, though some details remain to be defined.

Discussion of Definition of Invasive Species

- ✓ There's not a lot of difference between the state and federal definitions.
- ✓ The Texas definition uses the words "has been demonstrated", which puts the burden of proof of harm on those trying to create species lists. The criteria for demonstration are unclear. It's also possible that, by restricting ourselves to species that have demonstrated harm that we might miss some opportunities for early detection.
- ✓ The federal definition also includes definitions of other words we will need. We'll review the full Executive Order 13112 as other terms come up in our work.
- ✓ The Texas Government Code has evolved over legislative sessions and could change in the future.

Brainstorming about SMART Goals

Notes on Measurement Goal

- We want the system to be consistent (i.e. the same fields)
- We want each Department to control their own system and update their own data, but there is some central repository where it all gets combined.
- GIS SDE server – single file or project. Individuals can make edits. If there are conflicts, the system reconciles them later.
- Volunteers can go to their city staff contact person to input data on volunteer efforts.
- This is similar to a Weed Information Management System.
- We want at least some of the information accessible to the public through a viewer.

Standard Operating Procedures Goal Ideas

- Remove listings of all exotics from City of Austin literature.
- Staff knowledge of invasive species, determined through performance reviews
- All invasive species removed from City of Austin literature.
- Each department has its own plan and makes annual reports
- The Council/City Manager mandates each Department to achieve certain goals
- Knowledge of invasive species are part of SSPR (performance reviews) for those responsible for tasks related to invasive species management/control.
- An Advisory Board or Committee exists to oversee implementation
- We contact KVUE
- There's a central organization that contacts each Department for feedback and implementation. There are staff liaisons between this organization and each Department.

Control/Implementation Goal Ideas

- By 2016, invasive species treatment will have been implemented over 10% of city managed land (by land area.) Note: start with "low hanging fruit"
- By 2016, each City Department will have implemented invasive species treatment over 10% of the lands they manage.
- Determine the baseline data for invasive species distribution. By 2016, each City Department will have implemented treatment plans for a __% reduction (perhaps 10%) of the distribution from baseline. This can include volunteer efforts.
- Number of infestations removed?
- Map what you've done?
- Departments select exotics for treatment based on their Departmental mission.

Collaborative Problem Solving Around Goal for Public Education

The Interests

- Actions by the public affect our properties - both positively and negatively. We want to enlist their help and reduce the ways their actions negatively affect our properties.
- We want to stay within the scope of our charge (a Plan for City Departments)
- We want to maximize the impact of our literature, media, or campaigns. Right now they aren't branded.

Brainstormed Options

- City no longer purchases invasive species.
- An invasive species group or committee conducts a public survey every 5 years
- Number of volunteers working on invasive species projects and/or number of projects
- Number of city publications on invasive species
- Look at wholesale lists of plants over time (focus on changing demand)
- Educational signage at all management sites
- Have an awareness campaign
- News stories and media mentions
- A Channel 6 story
- City staff know the top invasives
- Survey of county officials
- Have an Invasive Plant week
- Establish baselines for
 - public attitudes about invasive species
 - current stock of invasives – change the proportions to higher proportion of natives

Discussion of Top Offenders chart

- Virulence = does it take over? Defined as potential to spread AND ability to affect the ecosystem function.
- Invasive potential – even if abundance is low, if virulence is high, it would have high invasive potential.
- Difficulty to manage = how hard it is to control the species, irrespective of abundance.
- We need to define all the terms.
- The current rankings are based on LBJWC staff experience with what they know of city-managed property, not absolute truth.
- There's lots of debate on Bastard Cabbage – is it an invasive species or just a weed? We don't know.
- It would be helpful to know how each of these species spread. Are they allopathic? It would help us understand what we're controlling.
- Maybe add a column for ecological impact – high, medium or low with a footnote about how chose it.
- The purpose of the chart is as a starting point for prioritizing species.
- Some possible categories are - First priority, second priority and early detection. Such categories might help with public awareness but the Departments need more information.
- The purpose column might be best served if it listed native alternatives for that purpose.

Parking Lot

To what extent can we address restoration in the plan? It's a vital component. Removal of invasive species without restoration is ineffective. Restoration is the ultimate point of all this!

Draft "Top Offenders" chart - Highlighted cells represent topics the group wants to discuss further.

Species	Abundance	Virulence, Invasive Potential	Difficulty to Manage	Potential Purpose Served	Landscape Type
Bamboo (running)		High	High		Uplands, Riparian
Bastard cabbage		?	High		Uplands
Bermuda grass		?	High		Uplands, Riparian
Blue stem KR		High	High		Uplands, Riparian
Cat claw		Low	Med		Uplands, Riparian
Chinaberry		Med	Med		Uplands, Riparian
Chinese parasol		Low	Low		Uplands
Chinese pistach		Low	Low		Uplands
Elephant ear		Med	Med		Instream
Giant cane		High	High		Uplands, Riparian
Hollyfern		Low	Med		Riparian
Hydrilla		High	High		Instream
Japanese honeysuckle		Med	Med		Uplands, Riparian
Johnson grass		Med	Med		Uplands
Kudzu		Low	Low		Uplands
Ligustrum (3)		High	Med		Uplands, Riparian
Malta star thistle		High	High		Uplands
Nandina		High	Med		Uplands, Riparian
Paper mulberry		High	Med		Uplands
Pyracantha		Med	Med		Riparian
Salt cedar		Low	Med		Uplands, Riparian
Tallow		High	Med		Uplands, Riparian
Tree of heaven		High	High		Uplands
Water hyacinth		Low	High		Instream

Meeting Evaluation

What We Liked	What We Would Change
Fabulous facilitation	The temperature in the room
Grouping our thoughts into categories	I got lost with all the poster pages
Fun, good group	Need to post a homework sheet
Effective, good use of time, getting critical thoughts together	

Attendees:**Working Group Members**

John Gleason

Jessica Wilson

Keith Mars

Matt McCaw

Chris Sheffield

Angela Gallardo

Eric Stager

Angela Hanson

Charlie McCabe

Kelly Conrad Bender

Wildflower Center staff

Damon Waitt

Travis Gallo

Matt O'Toole

Melanie Dishron

Michelle Bertelsen

Facilitator

Juli Fellows

DRAFT

Invasive Species Management Plan Working Group

March 21 , 2011 Meeting Notes

Executive Summary

Nine members of the Invasive Species Management Plan (IMP) Working Group and three Wildflower Center staff attended the third meeting of the Invasive Species Management Plan Working Group, hosted by Keep Austin Beautiful. The meeting goals were: 1) agree on which protocol to use for ranking species, 2) diagram how the Plan will be coordinated and managed, 3) plan how to brief the three COA Boards on the Plan, and 4) begin collaborating on the use of volunteers. No substantive changes were made to the 2/28/11 notes and all action items have been completed.

The group all agreed to officially use the California International Plant Protection Convention (IPPC) protocol for ranking species in the Top Invaders list. They chose this protocol over the PHELOUNG because of its scientific rigor and because there appears to be momentum behind it for use on a national scale. The group will examine PHELOUNG ratings for some of the species of interest as an informal cross-check. If significant differences appear, the group will review its decision.

They agreed on several goals for the Standard Operating Procedures goal area.

By 2016:

- ✓ Ensure that appropriate employees are evaluated on their performance of the Standard Operating Procedures for invasive species as part of their annual performance evaluation process.
- ✓ Get codification of our Plan and SOP in City codes for all CIP projects and all public development projects.
- ✓ ___% of employees in each Department who deal with vegetation management will have received appropriate training in the Standard Operating Procedures.

They also added a word and a date to one of the Public Education goals, as follows.

- ✓ By Jan. 1, 2012, the City of Austin no longer purchases or recommends known invasive species.

The group constructed a diagram to illustrate how the Plan might be coordinated and managed. They agreed that at least one FTE Coordinator would be needed and that a multi-Department Committee should still be responsible for decision making and setting priorities.

The next meeting will be held in the Keep Austin Beautiful conference room and the date will be determined through a Doodle.com poll of the members.

Action Items

Who	What	When
Keith	Get a feel from the Sustainability Office on whether the FTE might be a good fit in that office.	by next meeting
LBJWC staff	Develop a draft briefing (just a few slides) for city Boards	by 2 nd April meeting
Charlie McCabe, Angela H	Schedule a 10-min briefing with the UFB and Parks and Rec boards for May	ASAP
Angela G, Keith	Schedule a 10-minute briefing with the Environmental Board for May	ASAP
Matt O'Toole	Send the group an email when new information or documents are posted on the web site	Ongoing

Consensus Decisions Made March 21, 2011

- ✓ The February 28th meeting notes were approved with the date change at the top of page one.
- ✓ The California International Plant Protection Convention (IPPC) protocol is adopted as the official protocol used by the Working Group in ranking invasive species.

2016 goals for Standardized Procedures were adopted:

- ✓ Ensure that appropriate employees are evaluated on their performance of the Standard Operating Procedures for invasive species as part of their annual performance evaluation process.
- ✓ Get codification of our Plan and SOP in City codes for all CIP projects and all public development projects.
- ✓ ___% of employees in each Department who deal with vegetation management will have received appropriate training in the Standard Operating Procedures.

Changes to Public Education goal:

- ✓ By Jan. 1, 2012, the City of Austin no longer purchases or recommends known invasive species.

Advantages of Each of Two Protocols

California IPPC	PHELOUNG
<ul style="list-style-type: none"> • Has the support of California International Plant Protection Convention • Thorough • Rigorous • People are advocating for its use nationally • A lot of species assessments have been done with it. • Leans towards species that are already there. • Harder to argue with (scientifically) • Lots of academics support it. • Has an “alert” category. • Texas IPPC may adopt it. 	<ul style="list-style-type: none"> • Faster, quicker. • Includes 360 aquatic species already. • Yes/no answers to most questions. • 49 questions, must answer a minimum number in each section. • Includes more detail on climate matching. • Texas Parks & Wildlife is using it (also Florida, New Zealand and Australia). • Developed to evaluate NEW species – should they be allowed in or not? • Some have dinged it for insufficient rigorous evaluation.

Neither protocol deals with the economics of the species!

Interests related to choice of protocol

- Link to similar statewide efforts, be able to share with TDA Noxious and Invasive Plant List.
- Build on work already done.
- Be able to back up our assertions with science.

Options Considered (those in bold were selected by consensus)

- a. Do both protocols for our Top 20 invaders
- b. Do both protocols but designate one as the “official” one.
- c. Do CAL IPPC.
- d. Do all our top 20 in CAL IPPC and examine some of those 20 that have already been done in PHELOUNG.
- e. If we do option D, be sure to explain why we have both for some and not others.
- f. Do both protocols but designate CAL IPPC as the “official” one.
- g. Do option D and not where there’s a difference. Do PHELOUNG as a “sanity check”.
- ★h. **Do our Top 20 with CAL IPPC as the official protocol of the Plan. Unofficially, use PHELOUNG as validation. If we see significant differences, review our approach. A subcommittee of the Working Group will double check Travis’ work on the CAL IPPC protocols.**

Discussion of Standardized Procedures for all Departments

What it means in simple language:

All City of Austin Departments would do the same thing when they see an identified invasive species.

All City of Austin Departments would collect the same information, perform the same actions and get the same training on invasive species.

Brainstormed Ways to Measure if Standardized Procedures were being Used

1. For all city capitol projects, if they have invasives, they would all be treated the same (i.e. removed).
- ★2. **Record the number of standardized trainings – number trained in each Department.**
3. Have a work order sheet – species observed, treated, removal method.
4. Collect data on what was done and count the number of data sheets that weren't correct.
- ★5. **Include these behaviors in appropriate employee annual evaluations/performance standards. Make sure managers get training, so they know what the standards should be.**
6. Send the Standard Operating Procedures down from the top, through the usual hierarchy.
- ★7. **Make sure the Standard Operating Procedures are written out and easily available.**
- ★8. **Have inspectors' site plans include our Standard Operating Procedures. Get codification of our Plan and SOP in City codes for all CIP projects and all public development projects.**
9. Monitor City public education publications – no invasive species is listed in these publications. (e.g. the Grow Green Plant Guide/SmartScape has no known invasive species listed.)
10. Count the number of landscapers following the (updated) Grow Green Guide that emphasizes avoiding noninvasives. (There's an annual training opportunity here.)

Discussion of Plan Coordination and Management

Similarities between small groups' diagrams

- At least one new employee in charge of the Plan (a Coordinator)
- A committee of City Departments who work with the Coordinator.
- The Plan largely implemented through the Departments.
- Stakeholder involvement
- Feedback loop with the Coordinator and other levels
- Plan managed by new FTE

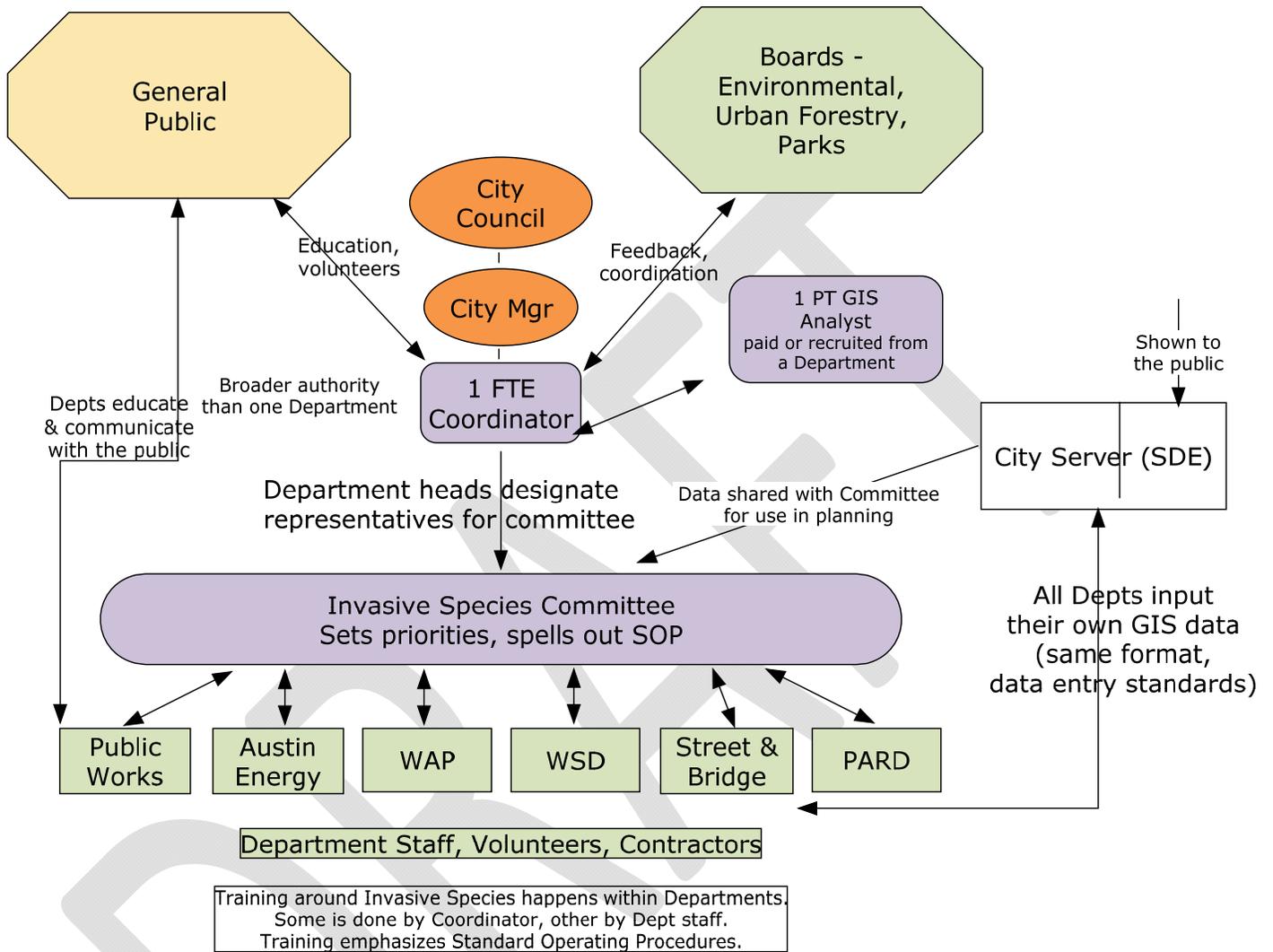
Consider whether the new FTE might be located in the Sustainability Office.

Differences between small groups' diagrams

- The groups that were mentioned as stakeholders
- One had a person to work with GIS, the other didn't
- One included distributing information to the general public.
- One said training would be done by the Departments
- One showed the City Manager at the top of the chart

The diagram on page 4 shows the consensus on how the Plan might be managed and coordinated.

Diagram of How Invasive Species Plan would be Coordinated and Managed



Boards With Whom We Are Required to Share the Draft Plan, upcoming dates and locations

Parks and Recreation Board

4/26 and 5/24

Meet at 6 p.m. City Hall, Room 1101

Environmental Board

4/6, 4/20, 5/4 and 5/18

Meet at 6:00 p.m. City Hall, Council Chambers

Urban Forestry Board

4/20 and 5/18

Meet at 6:30 p.m. at PARD Annex, Shoal Creek room

Plan for working with these Boards.

1. LBJWC staff will develop a 5-minute slide show about this project and its status, what's done and not yet done. This update might include a rough overview of the plan, cost estimate of the Plan and how it will affect your Department. It is a 10 minute BRIEFING not a hearing! Tell them we will come back later to ask for action.
2. Several Working Group members will go to represent the group, not just city staff.
3. Plan to brief the Urban Forestry Board first, then the Environmental Board, then Parks & Rec.

Collaborative Problem Solving Around Use of Volunteers

The Interests

- Reliable, valid data
- Using available resources, use full scope of talents available
- Personal safety – volunteers and staff
- Staying legal
- Volunteers become ambassadors for the Plan
- Volunteers get recognized for their work
- Consistent expectations across Departments
- Sustainable use of volunteers
- Quality control
- Recognizes Department policies

Brainstormed Options

- a. Consolidate volunteer training in one place. Be sure they are fully informed of Standard Operating Procedures.
- b. Have consistent policy regarding use of volunteers.
- c. Outline what volunteers can and can't do. (e.g. they can use hand saws and weed wrenches. They can't collect data.)
- d. License some volunteers to use herbicides and chain saws (through TDA courses).
- e. Let volunteers use some intermediate tools (more than a hand saw, less than a chain saw.)
- f. Pick project sites where volunteers can really help. Have experienced people do quality control.
- g. If volunteers are inputting data, have staff do quality control. Educate volunteers and do quality check on their data.
- h. Volunteers can use GPS to collect point data, take photos, but they don't enter data into city computers. Only staff do that, after verifying the point data.
- i. Volunteers do field observation, write down their documentation and GPS points.
- j. Only city staff input data into city computers.
- k. Be consistent in defining what data volunteers can collect.
- l. Have different levels of training, depending on what we're asking them to do.
- m. Make what volunteers do as reliable as what staff do.

- n. Review NAWMA standards (North American Weed Management Association) and follow them.
- o. Use volunteers to monitor after big projects. Have a monitoring protocol or standards.
- p. Throw periodic parties to recognize volunteers. Have some kind of public recognition for their impact on invasives.
- q. Use volunteers for restoration.
- r. Consistent tracking of volunteers across Departments (centralized data base). Good record keeping for volunteer projects.
- s. Make sure city staff are able to remove SOP-violating volunteers and communicate that across Departments (e.g. poison ivy guy)
- t. Individual volunteers can monitor/record hours spent on invasives.
- u. Central Gateway for potential volunteers to engage the city.

Meeting Evaluation

What We Liked	What We Would Change
Better temperature	Set the stage – past, current and future meetings
Progress on many things including the Plan, coordination of the Plan, use of volunteers	
Assessment protocol selected	
Sustained attendance	
Members are coming on time more	
Finished today's meeting early!	

Attendees:

Working Group Members

- John Gleason
- Keith Mars
- Matt McCaw
- Chris Sheffield
- Angela Gallardo
- Eric Stager
- Angela Hanson
- Charlie McCabe
- Kelly Conrad Bender

Wildflower Center staff

- Damon Waitt
- Travis Gallo
- Matt O'Toole

Facilitators

- Juli Fellows
- Matt O'Toole

Invasive Species Management Plan Working Group

April 4 , 2011 Meeting Notes

Executive Summary

Seven members of the Invasive Species Management Plan (IMP) Working Group, one alternate, four Wildflower Center staff and their intern attended the fourth meeting of the Invasive Species Management Plan Working Group, hosted by Keep Austin Beautiful. The meeting goals were to agree on recommendations concerning use of volunteers and herbicide use, to get briefed on WIMS, and to review a number of draft documents, including a new outline for the Plan. All due action items have been completed (see page 2 for details.)

Building on work done on March 21st, the group reached consensus on six recommendations on volunteer use. Five members reported on their specific Department or organization policies regarding herbicide use (page four) and the group agreed on six recommendations on herbicide use policies (page two). They learned about the Weed Information Management System and agreed to use WIMS data fields as the first cut at the fields in the proposed standardized, centralized record-keeping system for all Departments.

They agreed to revise the language of SMART goal #3 as follows:

Each Department will have implemented invasive species actions on at least __% of their total acreage

They reviewed a revised outline of the Plan and made several recommendations concerning it (page two.) They also looked at a sample Species Fact Sheet and liked it. Discussion of these documents is shown on page five.

The next meeting will be held in the Keep Austin Beautiful conference room on April 18, 2011 from 11 am to 3 pm.

Action Items

Who	What	When
Angela G, Keith	Schedule a 10-minute briefing with the Environmental Board for May	ASAP
Angela H	Send Matt O'Toole the Zilker Park IPM.	ASAP
Charlie	Explore ways of getting free help to establish a 3 rd party database for volunteer data and possibly a "gateway" for volunteers. (Volgistics might be model.)	ongoing
Eric	Send Matt O'Toole the US Fish and Wildlife Region 2 document.	by 4/18
Jessica	Send Matt O'Toole cost/benefit analysis information	by 4/18
LBJWC staff	Develop a draft briefing (just a few slides) for city Boards	by 4/18
Matt McCaw	Find out when the Water & Wastewater Commission meets and share that information with the group so they can consider scheduling a briefing with them.	by 4/18
Matt McCaw	Connect Charlie McCabe with Amanda Ross to get her ideas about the volunteer gateway and/or the volunteer database.	by 4/18
Travis	Send the group information on the specific data fields in WIMS	by 4/18
Working Group	Bring estimates of how much your Department is spending now on invasive management.	June-July 2011?

Consensus Decisions Made April 4, 2011

- ✓ The March 21st meeting notes were approved with a heading correction on page 5.

Use of volunteers:

1. Have a consistent policy between Departments on use of volunteers which, as much as possible, resolves the conflicts between Department policies.
2. Define clearly and specifically what volunteers can and can't do. Spell out the steps it takes to allow a volunteer to do certain tasks.
3. Volunteers will use both standard operating procedures and specific site plans to guide their work.
4. Have a volunteer certification process/workshop to enable them to become qualified to use herbicides and chain saws (through TDA courses). The workshop manual would be used by all Departments and the process would have different levels to qualify them for different tasks.
5. Establish a 3rd party database on which volunteer leaders from all Departments can reliably enter information, not just on volunteer hours, but also species removed and area treated. Use drop down menus to increase consistency and accuracy and ensure compatibility with Department databases. Work with City IT staff so the data can smoothly be exported to individual Departments if they choose. Use NAWMA standards. This might also be linked to a single gateway or interface for volunteers who work on invasives for all Departments.
6. Recognize and thank volunteers. Have some kind of public recognition for their impact on invasives.

Herbicide use

1. The overall goal is to use an Integrated Pest Management approach for management of invasives. This includes the principle of first evaluating all non-chemical options.
2. All departments should require following all label requirements including dilution, application, disposal of containers and licensing requirements for applicators.
3. All departments should require equipment maintenance.
4. What the law requires should be the minimum for all Departments. Departments can adopt more rigorous policies.
5. Clarify and specify the licensing requirements for city staff, volunteers and contractors. (Tx. Department of Agriculture will have these requirements.)
6. For land managers and Departments who deal with endangered species habitat, we recommend following the Protection Measures for Pesticide Applications from US Fish and Wildlife.

Standardized record keeping for all Departments

- ✓ Use WIMS data fields as a 1st iteration model for tracking invasives management over time.

The new draft outline for the Plan

- ✓ Make sure that restoration and rehabilitation are included as part of the process and general recommendations (not specific protocols for restoration)
- ✓ The group supports putting more details in the Appendices to make the main body more accessible and readable.
- ✓ Make as strong a case as possible in the Plan to justify funding it. Use hard data when possible.
- ✓ Include a map that shows at least some species locations.

Action Items Reports

- ✓ Keith spoke with Matt McCaw about the possibility of housing the FTE with the Sustainability Office. While this might be an option in the future, they both believe that office's highest priority right now is figuring out what they need to be doing and how to do it. Watershed Protection might be a possibility if the position is funded.
- ✓ The briefings for the Urban Forestry Board and the Parks & Rec Board are confirmed for May 4th.
- ✓ Travis found that CAL IPPC assessments have been done on 9 of our top 20 species. LBJWC got approval to do the remaining 11 assessments.
- ✓ The group might want to give the Water and Wastewater Commission an opportunity to review the Plan, particularly if it has funding implications for them.

Collaborative Problem Solving Around Use of Volunteers - Continued

The Interests

- Reliable, valid data
- Using available resources, use full scope of talents available
- Personal safety – volunteers and staff
- Staying legal
- Volunteers become ambassadors for the Plan
- Volunteers get recognized for their work
- Consistent expectations across Departments
- Sustainable use of volunteers
- Quality control
- Recognizes Department policies

Brainstormed Options

- a. Consolidate volunteer training in one place. Be sure they are fully informed of Standard Operating Procedures.
- b. Have consistent policy regarding use of volunteers.
- c. Outline what volunteers can and can't do. (e.g. they can use hand saws and weed wrenches. They can't collect data.)
- d. License some volunteers to use herbicides and chain saws (through TDA courses).
- e. Let volunteers use some intermediate tools (more than a hand saw, less than a chain saw.)
- f. Pick project sites where volunteers can really help. Have experienced people do quality control.
- g. If volunteers are inputting data, have staff do quality control. Educate volunteers and do quality check on their data.
- h. Volunteers can use GPS to collect point data, take photos, but they don't enter data into city computers. Only staff do that, after verifying the point data.
- i. Volunteers do field observation, write down their documentation and GPS points.
- j. Only city staff input data into city computers.
- k. Be consistent in defining what data volunteers can collect.
- l. Have different levels of training, depending on what we're asking them to do.
- m. Make what volunteers do as reliable as what staff do.
- n. Review NAWMA standards (North American Weed Management Association) and follow them.
- o. Use volunteers to monitor after big projects. Have a monitoring protocol or standards.
- p. Throw periodic parties to recognize volunteers. Have some kind of public recognition for their impact on invasives.
- q. Use volunteers for restoration.
- r. Consistent tracking of volunteers across Departments (centralized data base). Good record keeping for volunteer projects.
- s. Make sure city staff are able to remove SOP-violating volunteers and communicate that across Departments (e.g. poison ivy guy)
- t. Individual volunteers can monitor/record hours spent on invasives.
- u. Central Gateway for potential volunteers to engage the city.
- v. Allow certified and experienced landscape companies to volunteer.
- w. Allow pre-approved non-city employees to enter data onto city computers if they have adequate training.
- x. Record data for workdays – species removed, area treated, work hours. Biomass is not appropriate.
- y. Set up a separate 3rd party database, very user friendly, where volunteer group leaders could input data about workdays. Have drop down menus, to cut down on errors. Make it so it would be easy for city staff, after they've verified the data, to import it.
- z. Have city staff be the moderator or watchdog to ensure that volunteers who don't follow standard procedures are asked to follow the procedures or, if necessary, to leave.
- aa. Give some kind of badge to certified volunteers, so they are readily identifiable.
- bb. Have site plans approved by the Department that manages the land. Include site-specific information about treatment, removal, use of volunteers.

Discussion of Weed Information Management System (WIMS)

- WIMS is a free program built on ACCESS (prior to 2007).
- It might serve as a model for a standardized, centralized digital record-keeping system for invasive species management for all Departments.
- IMAPINVASIVES is another system that 3-4 states are using, but it costs about \$5,000 a year.
- EDMAPS is user friendly and free.
- NAWMA standards specify a minimum 6 data fields that should be collected.

Reports on Departmental Policies Concerning Herbicide Use

Texas Parks and Wildlife

- No specific agency policies exist but the agency is bound by Texas Department of Agriculture policies and the Texas Safety Code.

Parks and Recreation

- There is no current broad policy regarding herbicide use but there is a draft Integrated Pest Management program. The IPM outlines methodology and criteria for control, including herbicide use. It lists certifications needed. There's an approved pesticide list in the appendix. It also outlines notification requirements, record keeping, and very specific operating procedures (including in special situations like near waterways). There are separate detailed IPMs for each city golf course and for Zilker Park.

Austin Energy

- There is no standard policy but they have an Integrated Pest Management Program and standard practices. There are at least two IPMs for aquatic species and areas, like Decker Lake.
- For the Right of Way for transmission lines, they follow the US Fish and Wildlife Region 2 document.

Water Protection Department

- There are no water utility-wide policies on herbicide use.
- The Balcones Canyonlands Project has recommendations only. The recommendations aren't necessarily consistent nor followed.
- The Water Quality Protection Program has an Integrated Pest Management Plan with lots of specifics and clarity. Included in that plan are policies, management by species, approved herbicides, supervisory and records requirements. The IMP emphasizes control over prevention and might be strengthened by a more wholistic, land management approach.
- The Water Protection Department has an Integrated Pest Management Plan, including the basics for in-house field crews. It states that there should be no chemical use in removing invasives.
- There are separate Integrated Pest Management Plans for storm water ponds and dam safety programs. These permit use of herbicides.
- The Environmental Resource Management Division uses American Youth Works and allows use of some herbicides.
- Typically buffers of 10 feet or more are established for bodies of water when using herbicides not labeled for aquatic use.
- These IPMs include protocols on weather conditions and use of personal protective equipment.

American Youth Works

- AYW follows site-specific plans, which specify the goals, which herbicides may be used, etc.
- AYW has its own "unlicensed applicator" training for volunteers.

Discussion of the Plan and its Structure

- Two parts – a) IPM for top 20 species (what is most effective) and b) policies and procedures.
- When individual policies and procedures vary, clarify the differences.
- General format for IPM for invasives would list methods in a hierarchy, starting with cultural, then mechanical and biological. Chemical means would be last in the hierarchy.

Discussion of the Fact Sheets

- The audience for these fact sheets are the public and volunteers, plus inexperienced project managers.
- Each of the top 20 species will also have a detailed protocol or Management Strategies Page intended for use by land managers. These pages will list all types of management on one sheet (e.g. not separate for riparian, wild lands, etc.) These species-specific management strategies should be put in order of hierarchy (chemicals last) and should list specific chemicals, not brands, that are effective.
- There can be a Table in the Appendix that lists “Commonly Used Brand Names” for the various chemical ingredients.
- Each fact sheet will briefly reference the principles or hierarchy of Integrated Pest Management (e.g. treatment should follow the hierarchical order, chemical means should be considered last.) The level of detail on these chemicals should be similar to that on the Arrundo sample sheet. All Fact Sheets that mention specific chemicals should have the same disclaimer about herbicide use.
- Fact sheets will need to be updated regularly (by the FTE?)
- There will be a separate Management Techniques chapter that details how to perform specific techniques.
- Pull information from existing Integrated Pest Management Plans whenever possible.

Meeting Evaluation

What We Liked	What We Would Change
We got through a lot	Might need jumping jacks to keep our energy up in the afternoon
Tangible examples like the fact sheets and WIMS information	
Reviewing where we are and how we got here.	
Jessica’s lemon squares!	
We ended early.	

Attendees:

Working Group Members

John Gleason

Keith Mars

Matt McCaw

Seth Van Horn for Chris Sheffield

Eric Stager

Angela Hanson

Charlie McCabe

Jessica Wilson

Wildflower Center staff and intern

Damon Waitt

Travis Gallo

Matt O’Toole

Michele Bertelsen

Megan Brown

Facilitators

Juli Fellows

Matt O’Toole

Invasive Species Management Plan Working Group

April 18, 2011 Meeting Notes

Executive Summary

Eight members of the Invasive Species Management Plan (IMP) Working Group and three Wildflower Center staff attended the fifth meeting of the Invasive Species Management Plan Working Group, hosted by Keep Austin Beautiful. The meeting goals were to review the implications of using the full 2007 USFWS document, identify key required pieces of reporting information, review the Board briefing slides, seek consensus on priority rankings within the Top 20 species and discuss what ground crews need to help them implement the Plan. All due action items have been completed (see page 2 for details.)

Matt McCaw read the entire document (White, 2007) from the US Fish and Wildlife Service and identified a number of interests and concerns (pages 2-3) about recommending that this document be followed in its entirety. The group agreed and changed their recommendation to make following this document an option, not a requirement. Parts of the document, like the table of toxicity, will be very useful to the group and will be explored for possible recommendations.

They examined the data that Travis entered for *Nandina* using the CAL IPPC protocol. Travis will try to get as many of the Top 20 species entered as possible by the May 2nd meeting, so that the group can review the rankings and decide if they want to set priorities within the Top 20. They will also consider if they should set some minimum standard for the level of documentation required for a species to make it to this list. The group talked about what grounds crews need in order to help them implement the Plan and identified 10 recommendations about this. See page three for these recommendations.

The next meeting will be held in the Keep Austin Beautiful conference room on May 16, 2011 from 11 am to 3 pm.
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Action Items

Who	What	When
Angela H	Send John G. the Great Lawn portion of the Zilker Park Plan when it's available. Forward John Diaz's email to John Gleason.	ASAP
Charlie C.	Help is available with creation of the database.	Ongoing
Dept reps	Bring estimates of how much your Department is spending now on invasive management, after a worksheet has been developed to show you how to do this and what to include.	Summer 2011?
Everyone	Review the toxicity table in the USFWS document (on the web site) and think about whether to make a recommendation about use of the least toxic herbicides.	By 5/2
Everyone	Download WIMS and play with it, see how it works for you.	By 5/2
Everyone	Approve a list of the organizations that will be invited to review the draft Plan.	5/2
Juli F.	Redo coordination diagram to replace "FTE" with "IPM Coordinator"	4/20
Matt Mc	E-troduce Charlie and Travis to Amanda Ross so they can talk about the database.	By 5/2
Matt Mc	Identify who schedules briefings for the Water & Wastewater Commission meetings.	By 5/2
Matt Mc, Angela G, Charlie C	Collaborate on the database and required fields and bring a proposal to the May 2 nd meeting.	By 5/2
Matt O	Look at the cost estimates for the 21 projects and create a worksheet to help the Departments come up with costs for invasive species by fiscal year.	June-July?
Matt O	Send Angela G. the shape file from Matt McCaw. Upload the WIMS manual to the web site.	By 4/22
Matt O	Add an opening slide to the Board briefing deck showing a good illustration of the impact of invasive species (terrestrial species like bastard cabbage vs a field of wildflowers.) Simplify the text as much as possible. Send out the updated slides.	4/22
Matt O.	Upload the updated Board briefing slides to the web site.	
Travis	Look for the worksheet that shows how they arrived at the \$21.47/hour value of a volunteer	By 5/2

hour. Share what you find with the group.	
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Board Briefings Scheduled

May 4 – Environmental Board – John G, Angela G, Keith M and WFC rep

May 18 – Urban Forestry Board – Angela H and Jessica

May 24 – Parks and Rec Board – Charlie, Matt O’Toole

Consensus Decisions Made April 18, 2011

- ✓ The April 4th meeting notes were approved with a typo correction on page 2, correction of Seth Van Horn’s name as the representative of American Youth Works, and correction of the language about AYW’s training for unlicensed applicators [of herbicides].

Herbicide use (change of recommendation from 4/4)

1. For land managers and Departments who deal with endangered species habitat, the Protection Measures for Pesticide Applications from US Fish and Wildlife (White, 2007) may provide useful information and may be followed if a Department chooses to do so. However, the Working Group does not recommend requiring all Departments to follow the entire document.

Action Items Reports

- ✓ Angela and Keith scheduled a briefing with the Environmental Board for May 4.
- ✓ Angela H. tried to get the Zilker Park IPM but it is still in development and it isn’t known when it will be ready.
- ✓ Damon is helping to build a statewide database on the cost of invasive species, including the value of volunteer hours.
- ✓ The Parks Board briefing is scheduled for May 24th. Slides are needed by May 13th.

Collaborative Problem Solving for Recommendation concerning USFWS document

Context

- Watershed Protection deals with 8 of the 10 endangered species in this area and many staff in that Department had never seen this document. The Watershed Protection Department had active Conservation Plans developed and approved before this document came into existence.
- This document represents recommendations only – it is not binding.
- The document is for the entire Southern region and includes many species not in Austin and it also includes all migratory birds.
- The document includes very useful information, including a table rating the toxicity of every pesticide.
- Austin Energy had to either develop their own Habitat Conservation Plan for the Houston toad or adopt the Houston Toad provisions in this document. They chose the latter.

The Interests

- Not overriding existing, approved Habitat Conservation Plans.
- Not being more restrictive than actions in the Balcones Canyonland Preserve and Barton Creek Salamander Habitat Conservation Plans.
- Using what is valuable within the plan.

Agreements

- ✓ The group will review the toxicity table and consider making recommendations based on it at the May 2nd meeting.
- ✓ Individual Departments may choose to follow some or all of the document recommendations but are not required to do so under the COA Invasive Species Management Plan.

Discussion of Required Data Fields

- Can't just use WIMS because there's no support behind it.
- The city can copy the WIMS fields and allow people to access it via the web.
- You might set up separate permissions for staff and volunteers, so that volunteer-entered data is considered provisional until approved or checked by staff.
- How would you know exactly where a treatment was done in a very large parcel? Options might include having a series of latitude/longitude coordinates to create a polygon or uploading a field map or uploading an Excel or CVS file that connects to the database.
- One interest is in not duplicating what already exists or having to manage two systems.
- Another interest is having it be user-friendly for volunteers and also verifiable.
- Some city parks have multiple OFFICIAL names!

Recommendations about What Crews Need to Help Implement the Plan

1. Each crew should have one licensed pest control applicator on the crew.
2. Crews need hands-on training on identifying invasive species and treating them. The Fact Sheets will be helpful but they need to be shown as well as told with words on paper.
3. Clearly define what crews can do and what volunteers can do.
4. Identify a set of priorities – both species and geographic areas.
5. The Working Group should come up with a short list of talking points (5?) about the rationale for dealing with these species, what to do about them and how to flag what they find.
6. Program Managers should identify some implementation goals and prioritize where invasive species management comes among all the crew priorities.
7. Crews need access to treatment materials and equipment (see recommendation #1).
8. Departments should have a point-of-contact between the Department and volunteers to coordinate efforts and decide when (and where) to use crews and when (and where) to use volunteers.
9. Crews need to know how to report what they find.
10. Each Department should have access to a standardized yard-sign-sized sign that can be placed in work areas, to educate the public. These signs should have everyone's logo, a unified "brand" such as "Least Wanted" or "Hello... Goodbye..." and a place for contact information (the Department or APF or KAB).

Discussion of Cost Estimates for Invasive Species

- This cost estimate is for the purpose of creating a baseline both for estimating future costs and to compare to future costs, which is required in the referendum.
- We have the costs for 21 projects (\$3.4 million) submitted by Alice. Those numbers were pretty ad hoc based on what could be documented at the time.
- A standard estimate of the value of volunteer hours is \$21.47/hour. Is this valid and defensible for Austin?

Meeting Evaluation

What We Liked	What We Would Change
Got out early.	
Always very efficient, I like these meetings.	
Matt McCaw for plowing through the entire USFWS document for us	
Everyone was very prepared.	
Matt and Juli's efficient email communication (e.g. about action items.)	
Having visuals, seeing the slides.	

Attendees:

Working Group Members

John Gleason
Matt McCaw
Chris Sheffield
Angela Hanson

Charlie McCabe
Angela Gallardo
Kelly Conrad Bender
Jessica Wilson

Wildflower Center staff and intern

Damon Waitt
Travis Gallo
Matt O'Toole

Facilitator

Juli Fellows

DRAFT

Invasive Species Management Plan Working Group

May 16, 2011 Meeting Notes

Executive Summary

Seven members of the Invasive Species Management Plan (IMP) Working Group, three Wildflower Center staff and an intern attended the sixth meeting of the Invasive Species Management Plan Working Group, hosted by Keep Austin Beautiful. All due action items have been completed. Page two shows the new and ongoing action items.

Targets for SMART goals #3 and #6 were set. The group agreed on a goal of 25% of current acreage to have received management action in five years. They also agreed that 100 percent of vegetation management employees would be trained within five years and defined who that would include. They identified specific negative impacts caused by invasive species and lack of coordination of efforts. Those impacts fell into three categories – economic, health and safety, and ecological. The lists are shown on page four.

Damon Waitt demonstrated the *Eradicator Calculator* – an initiative of TexasInvasives.org – to collect data on the cost of treating invasive species in Texas. The group agreed that this tool had a different purpose than the City of Austin centralized database and that it was useful. They foresee inputting data from the COA database into this tool.

The timeline and process for writing and gathering feedback on the draft Plan were outlined. The group added several umbrella organizations to the list of those who will be invited, probably via survey, to comment on the draft Plan. Unfortunately the Plan approval process is out of sync with the city budget-writing timeline. Although a mid-year appointment is not impossible, it's much more challenging, especially for Departments that rely on General Funds. The question remains how to keep momentum up if the Coordinator doesn't start until October 2012.

The group agreed to make a recommendation concerning herbicide toxicity as follows:

- Always use the least toxic, effective economical approach first.
- When using herbicides, use the least toxic effective herbicide. (the USFW 2007 table may be a useful reference.)

The group still needs to discuss what the full cost of implementation might be. Once data are gathered this summer on current costs, the group needs to think through how to forecast it. Eventually, crews will need more people and Keith's Department may be doing more permits.

Three Fact Sheets, developed by Megan Brown, were reviewed by the group. They were pleased with the progress and made some suggestions, particularly dealing with the level of specificity of the Management Strategies/Control section (see page three for these agreements.)

At this time the group decided not to prioritize species within the Top 24 list, in part because the data are not uniformly robust and distribution estimates are not specific to Austin. They did, however, agree that when an alert was triggered, that species would be deemed high priority. Each Department can set priorities within the list in accordance with its mission.

This was the last meeting facilitated by Juli Fellows; Wildflower Center staff will take over the remaining facilitation duties. The next meeting will be scheduled after the draft has been written and before it is sent out for comment.

Action Items

Who	What	When
Angela G	Schedule a briefing for Damon to do with the City Manager's office about this effort.	1-2 mos.
Anyone doing briefing	Matt O can tailor the briefing slides for your presentation – just let him know what you need.	ASAP
Charlie C.	Help is available with creation of the database.	Ongoing
Damon	Send Matt the regrowth study, information about frequency of revisiting treated sites. Find out from Ray Henning about the local tree study.	5/31/11
Dept reps	Bring estimates of how much your Department is spending now on invasive management, after a worksheet has been developed to show you how to do this and what to include.	Summer 2011?
Eric	Get Angela Gallardo the right-of-way GIS information.	5/31/11
Jessica	Send Matt data on inventory of species in Blunn Creek.	5/31/11
Kelly	Send Matt information on unsuccessful bird nesting in invasive species. Also send information from the MA thesis on Blunn Creek.	5/31/11
Kelly,	Send Matt O. information on the effects of ligustrum on game fish opportunity.	5/31/11
Matt M	Send Matt O information on the reduced groundwater recharge that is affected by canopy cover.	5/31/11
Matt M., Angela, Keith, Angela G	Meet at Angela G's office to work out how to describe the "gross areas" in the comprehensive data base.	5/31/11
Matt O	Look at the cost estimates for the 21 projects and create a worksheet to help the Departments come up with costs for invasive species by fiscal year.	June-July?
Matt O.	Create a slide in the briefing deck that explains what the problem is for people who don't understand why invasive species need to be targeted.	5/18/11
Matt O.	Add Public Works (PWD) to the diagram as one of the six Departments. Add a box between the City Manager and the FTE called "City Dept to be determined". Lighten the background of all the boxes. Bracket the six Departments so that the line to the GIS coordinator looks like it's going somewhere.	5/18/11
Travis	Keep some notes as you are making the assessments, so that people who do these in the future will have information they need to update or add new assessments.	ongoing
Working Group	Schedule a follow-up briefing with the Environmental Board before the Plan is submitted to the City Manager's office	tbd
Working Group	Talk about the cost to implement the Plan, not just the FTE. How do we forecast based on the data we're collecting about current costs? Eventually the crews will need more people. There may be more permits that need reviewing.	Summer 2011
Working Group	Talk about best use of unspent contract funds.	Summer 2011

Board Briefings Scheduled**May 18 – Urban Forestry Board – Angela H and Jessica****May 24 – Parks and Rec Board – Charlie, Matt O'Toole****June 8 - Water and Wastewater Commission – Matt McCaw and Matt O'Toole**

Consensus Decisions Made April 18, 2011

- ✓ The group agreed on targets for the 2016 SMART goals #3 and #6 as follows:
 - Each Department will have implemented invasive management actions on at least 25% of their total acreage. (Note: this does not imply that 25% of the acreage will have eradicated invasive species.)
 - 100% of vegetation management employees will receive training. [These include field crews, inspectors, inspector supervisors, contractors and applicable review staff.]
- ✓ City of Austin staff could export some subsets of their data from the centralized database into Eradicator Calculator.
- ✓ The draft Plan will be sent to umbrella organizations for review. The review that is being requested is not editing but, perhaps through a survey, a general response and request for support of the Plan. Local groups such as SOS, Austin Native Plant Chapter, local Sierra Club, local Audubon Society, and Treefolks will be invited to participate in implementation and invited, with the public, to comment via the web site.
- ✓ AgriLife (Don Renchie), National Wildlife Federation (Marya Fowler), National Resource Conservation Service, and the Austin Bastrop Colorado River Corridor Partnership (Kevin Anderson) will be added to the list of groups invited to respond to the survey on the draft Plan.
- ✓ At some point the Plan will be posted on the web and the public and invited stakeholders will be given an invitation to comment.
- ✓ The group approved a recommendation concerning herbicide toxicity as follows:
 - Always use the least toxic, effective economical approach first.
 - When using herbicides, use the least toxic effective herbicide. (White 2007 table may be a useful reference.)
- ✓ The group wants the Fact Sheets to use the condensed font for the disclaimer. On the management strategies box, the group prefers the underlined category approach (not all in one paragraph or just bullets.) They want general direction as in the Aranthus example, not detailed specifics like the Arundo example. They like the idea of putting the plant name in the header on both sides. Be clear about what the general public can and can't do (e.g. burning.) It's OK to list active ingredients in referring to herbicides, but not specifics like 4% solution. Use an approach similar to the Grow Green guides.
- ✓ Specific details such as percent solutions of herbicides will be included in the tech sheets for land managers.
- ✓ The Facts Sheets could be included on the Grow Green web site.
- ✓ Because the data isn't uniformly robust and Austin distribution isn't clearly known, the group decided not to prioritize within the Top 24 list. They did, however, agree that if an alert is triggered, that species should move up in priority. An alert is triggered by specific combinations of section scores that indicate significant potential for invading new ecosystems.
- ✓ The group agreed that specific priorities within the Top 24 list would be set by individual Departments, according to their mission and assessed distributions.
- ✓ The Top 24 list assessments should be updated after the initial distribution data is mapped and then perhaps every 5 years subsequently.

Action Items Reports

- ✓ The briefing with the Environmental Board went well (Angela, Travis and John attended.) The presentation created by the Wildflower Center was well received and there were few questions. There was some hope that the WFC would do all the mapping (that's incorrect.) The Environmental Board would like a follow-up report before the Plan is presented to the City Manager. This Board is likely to support the recommendation for a Coordination position.
- ✓ All other due action items were completed.

Specific Negative Impacts of Invasive Species in Austin (and of lack of coordination)

Economic

- A study has shown that birds will nest as often in invasive species but their nests are about half as successful as nests in native species. (The cause of this is still under study.) This creates one more stressor on endangered bird species in both grasslands and arboreal habitats. Birdwatching has an economic impact on Austin.
- Texas Red Oak, which is critical habitat for endangered birds, will germinate but not establish itself when light becomes limited. Species such as ligustrum frequently limit the light.
- Ligustrum lowers the game fish opportunity.
- Canopy cover affects groundwater recharge (reduces it.)
- Wildflowers are a big tourism draw and invasives reduce wildflower populations.
- The wrong trees are planted under power lines (e.g. hackberry)

Health and Safety

- Canopy cover affects groundwater recharge (reduces it.)
- There's data on invasives effects on fire from West Texas. Lower diversity canopies burn with higher intensities and are more likely to carry canopy fires.
- Safety site designs improve visibility, along trails, etc. A monoculture reduces visibility in park areas.
- Hydrilla has caused at least three drownings in Decker Lake (which is the site of the Danskin triathlon.)=

Ecological

- A study has shown that birds will nest as often in invasive species but their nests are about half as successful as nests in native species. (The cause of this is still under study.) This creates one more stressor on endangered bird species in both grasslands and arboreal habitats.
- In the Blunn Creek Nature Preserve which has been fully inventoried, a startling percent was invasive species. This managed space is not a showcase of native plants as we might hope.
- Twenty percent of all trees mapped citywide were invasives, especially tallow and chinaberry.
- Unchecked invasives are actively reducing diversity in the urban forest.
- Texas Red Oak, which is critical habitat for endangered birds, will germinate but not establish itself when light becomes limited. Species such as ligustrum frequently limit the light.
- Ligustrum lowers the game fish opportunity.
- There's no malta star thistle on the WFC grounds except where the Austin Water Utility crews have done work (they spread this invasive to other properties.)
- There are places where the City intends to be planting native mixes but because the crew didn't complete clean the equipment, what they are spreading is contaminated with Bermuda grass.
- City CIP projects go forward with landscape plans that include invasive species.
- During a UT project on park property, there were volunteers removing invasives in one place and other volunteers planting invasive species in another. (Jessica has details.)
- The 7th Street construction included non-native palm trees.
- What is happening now is a shotgun approach, which makes much less progress towards our eradication goals.
- Blunn Creek Preserve has had six years of monitoring and has made no progress. This is an argument for revegetation and strategic targeting.)
- We need flexible treatment frequencies to tell us how often to come back in order to be effective (put this in the mapping process.)

Discussion on proposed data fields (just the GIS side)

- It will include everything in WIMS except the “township” field.
- The City doesn’t allow non-employees to upload images – we’ll have to work that out.
- There will be drop-down menus for all fields.
- This had to be built from scratch. It will take about a month to complete unless the image uploading issue causes a delay.
- Will be able to link the maps to the treatment data input. Revegetation efforts will get logged in on the WIMS side.
- It would be nice to be able to monitor success of revegetation efforts.
- Watershed names and park names would be used to describe the “gross area”. There’s some question about what Watershed Protection would use for this, as they currently just input polygons. Using the MAPSCO grid is one possibility. Using the Watershed Protection Management Areas is another idea.
- We need to be precise about what areas are treated.
- You’ll be able to view areas through a layer of watershed, to see what’s been done in a given watershed. Not including watershed in the data fields makes it run faster.
- PARD is still involved in right-of-way tree removal but eventually Public Works will take this over entirely. Not sure who would be willing to report this data.

Discussion of the Eradicator Calculator

This tool, developed and maintained by TexasInvasives.org is intended to gather data statewide on the costs of invasive species – where efforts are happening, by whom and for what species. It’s not mapping the treatment efforts but the costs of those efforts.

We hope that both volunteers and agencies would enter their efforts, both public and private.

- This should have a disclaimer to the effect that “by entering your data you are agreeing to...”
- Staff can enter their own figures for staff time costs. Volunteers will all be calculated using the agreed-upon standard of \$21.36/hour.
- You’ll be able to query for specific cities or counties.
- KAB could upload totals of data, since it’s sometimes hard to get individual volunteers to report data.

Discussion of Process and Timeline

Unfortunately, this process is out of sync with the timeline for hiring staff. 2012 budgets are being finalized now. It’s challenging to get mid-year appointments, especially for Departments that are dependent on General Funds. At this point, without some luck and a lot of hard work, it’s realistic to think that any new FTE for this project would start Oct 1, 2012. The options are:

- Finish the Plan early and hope the new person could start Oct 1, 2011.
- Slow down and set the target date for approval for spring 2012.
- Adopt the Plan in October 2011 and delay implementation until October 2012.

Meeting Evaluation

What We Liked	What We Would Change
All the exact examples.	Because it was the last meeting before writing the draft, it was an aggressive agenda.
Everyone did their homework.	
Focused conversations	
We know where it’s going after this. We have clear action items.	

Attendees:

Working Group Members

John Gleason
Matt McCaw
Chris Sheffield
Angela Hanson

Angela Gallardo
Kelly Conrad Bender
Jessica Wilson

Wildflower Center staff and intern

Damon Waitt
Travis Gallo
Matt O'Toole
Megan Brown

Facilitator

Juli Fellows

DRAFT

Invasive Species Management Plan Working Group
Meeting 7; August 18, 2011

Meeting Goals

1. Review and discuss draft plan structure, deletions, and additions.
2. Assess departmental costs, plan implementation costs, and forecasted costs.
3. Brainstorm potential funding sources, including internal funding.
4. Review and discuss fact sheets and management protocols. Make a recommendation about preferred structure.
5. Review selection of management protocols in detail. Possibly form a subgroup to review and make recommendations on all management protocols.
6. Discuss weed risk assessments. Identify volunteers for review.

Agenda

- 12:00 Introduction (Matt O'Toole):
 Arriving - KAB Representative, Monica Lopez Magee
 Departing – Elizabeth Chapman (LBJWC Intern, TAMU BLA 2011)
 Meeting Overview
 Review Meeting Notes from 5/16/2011 – any changes?
 Review Action Items from 5/16/2011 – updates?
 Contract Extension
- 12:10 GIS Database Update (Angela Gallardo)
- 12:15 FTE(s) Memo, Letter of Support Update (Matt O'Toole, Angela Gallardo)
 Commentary from Kelly Snook, PARD Asst. Director (Walter Passmore)
- 12:25 Davis et al. 2010, Article Discussion (John Gleason)
- 12:40 Draft Plan Commentary (structure, incorporate, cut) (Michelle Bertelsen)
- 1:30 Break (10 or 20 minutes)
- 1:50 Chapter 6, Costs & Funding Sources (Matt O'Toole)
 Annual Costs (Department Submission, Table 2.2)
 Costs to Implement Plan/Control Costs
 How to Project Added Costs (Forecast)
 Funding Sources (Federal, State, Local, Private)... Any additions, etc?
 Internal Funding Sources (Urban Forestry Grant Program, Mini-Grants (KAB/APF))
 Volunteer Matching (Grant Proposals)
- 2:50 Break (10 or 20 minutes)
- 3:10 Field Resources Book (Michelle Bertelsen)
 Fact Sheets... general comments
 Management Protocols... general comments

Detailed review of Ligustrum, Chinaberry, Johnson grass, and Hollyfern management protocols. (internal protocol vs. external information; level of specificity)
Form subgroup to review all management protocols?

- 3:40 Review of Weed Risk Assessment (Travis)
- 3:50 Wrap-up (Matt O'Toole)
 - Schedule Meeting 8... time frame
 - Submission of Plan to Advisory Group... when?
 - LBJWC Evaluation: 'The Good, the Bad and the Ugly'
- 4:00 Adjourn

Invasive Species Management Plan Working Group
August 18, 2011 Meeting Notes

Action Items

- All – Plan and Field Resources edits.
- John G. - List of IPM's to include/reference in Plan
- John G – Investigate Urban Forestry Master Plan
- Matt M. – Provide articles of invasive and native plants in reference to Chapter 1.
- All – Provide cost estimates to Wildflower Center staff (2 weeks, 9/1/11)
- Charlie/Monica – Provide total volunteer contribution for costs table
- Angela/Walter – Provide sources (websites) for grants opportunities (Neighborhood Partnering Program, FEMA Flood Plain Grants, 310 Grant)
- Matt O/Angela/Walter/Angela H. – Work on forecasted cost estimates of the Plan (Implementation & Control)
- Charlie – Provide web-link to Matt O. on parklands grant
- Walter - Provide sources (websites) for grants opportunities (TFS urban and community forestry assistance program, USFS national fire plan)
- Damon - - Provide sources (websites) for grants opportunities (NPSOT)
- Matt M., John G., Chris S. - Evaluate management protocols as a subgroup.

Consensus Decisions Made on August 18, 2011

- ✓ The group agreed to approach Council, staff, and facilitate Victoria Li about the importance of the FTE position to the success of the plan.
- ✓ The group agreed to continue to push for resources for the FTE position in the Plan.
- ✓ The group agreed to add language in the Prioritization section of the Plan that relates to site treatment based on potential (restoration, education, function, phasing, and funding).
- ✓ The group agreed to provide an average annual cost estimates by department, adding Public Works and removing Planning and Development Review to Table 2.2. A total sum of volunteer contribution will be added to the table as well.
- ✓ The group agreed to provide volunteer and public sector contributions in the use of matching funds totals in grant applications.
- ✓ The group agreed to include contacts of Keep Austin Beautiful and Austin Parks Foundation in the funding section of volunteer organizations.
- ✓ The group agreed to work with institutions for opportunities in projects and research for gaps in knowledge.
- ✓ The group agreed to remove 'codify' from the plan and replace with 'policy'.

Topics of Discussion

GIS Database Update (Angela G.)

- The GIS Interface is designed and waiting on areas from the participating departments.
- The Oracle/CTM aspect is not complete and WPD is waiting on Council approval for public submission to the database.
- WPD is waiting on approval of an MOU between PARD and WPD for GIS information.

FTE Position(s) Memo Update and PARD Response

- PARD did not want to house position (Kelly Snook)
- PARD desires to have team implement plan without FTE (Kelly Snook)
- No official information on FTE is available. WPD staff is waiting on budget discussion on 8/24/2011 (Angela G.)

LBJWC, 8/15/2011

COA IPM Working Group_August 18_MtgNotesV1

- Council mandated this group to create Plan, was an FTE in mandate? (Keith M.)
- WPD, small amount of additional projects for FY 2012, funds for position (Angela G.)
- Group consensus to facilitate FTE to Victoria Li (WPD), Group approaches Council and Staff
- Recommend beyond current budget, funding comes with it
- Created system needs FTE, not sustained by quarterly approach (Keith M.)
- Tie importance of FTE back to mandate
- Options:
 - Postpone plan until resources available
 - Modify plan to deal with individual
 - Continue to push for resources of FTE (Charlie)
 - Position of demonstrate need (Matt)
 - Demonstrate need of FTE, not getting it done (Keith)
 - Demonstrate financial implications of not having FTE to implement (Walter)
 - Cost to Not Coordinate/Implement! (Walter)
 - Will convening of working group succeed?
 - GIS position?
 - W/o FTE, no one point of contact
 - Responsibility of position, fundraising and gathering of funds for pay (Matt)
 - Plan will fail w/o FTE
 - Cost effective analysis, vs. not paying for FTE, vs. current costs... additional benefit

Davis Article

- The discussion centered on the function of species and the decision to remove or leave specimens.
- Example 1: Mouth of Shoal Creek, armor erosion on pier, Large Shade Chinaberry, Remove?, Plant serving purpose (shade), if equipment and resources are available with adjacent projects... management will occur
- Example 2: Poison Ivy removal (Stacy Park), volunteer treat with herbicide throughout riparian zone, citizen concerned and not informed, herbicide use (when/where)
- Prioritization standpoint (not comprehensive management), higher priority on site (sensitivity), restoration potential (invaded vs. function) (Walter)
- High profile place, education potential (Damon)
- Areas of heavily species impact, reintroduce native species, invasive and site condition (Charlie)
- Naturalization of species (spread over time), function of plant, what's using it, BCV/GCW (use of invasives) (Keith)
- Take out some, plant some (slow progress), treat dispersal of plant (Chris)
- Prioritization section (education, guidance) (Damon)
- Site by site for removal, what are reasons (Travis)
- Climate change, add language in prioritization section, projects based on potential (restoration, education)
- Parameters, site selection process, environmental benefits by removal (Walter)
- Leave species, why (John)
- Phasing, time frame, with adequate restoration (Charlie)
- What is phasing, life of tree, funding? (Matt)

Plan Edits

Plan Chapters 1- X

Minor changes

LBJWC, 8/15/2011

COA IPM Working Group_August 18_MtgNotesV1

- Remove codify and replace with policy. Codify is regulatory and applies to city departments and the public.
- Direct people to the Field Resources book early in the document
- Add scientific names to Top 24 chart
- Connect this document more strongly to departmental IPMs and Land Management plan. Recommend annual updates of individual IPMs.
 - List existing IPMs and land management plans
- Add citations to “...2nd only to habitat destruction” phrase in introduction. Add examples
- Consistency: numbers, capitalization, use of words (invasive, undesirable)

Introduction section

- Add brief philosophical section on control, introducing the IPM approach and rationale for herbicide use (cost, safety, environmental protection), after the impacts section.
- Add Mayfield Park example to the Why do we care paragraph.
- 1.3 Reword the cost estimate of environmental damages and losses sentence to clarify what “environmental damages and losses” means.
- 1.5. “majority originally introduced” to majority of invasive species were originally introduced by people intentionally or unintentionally.
- Water yield paragraph. Mixing succession and invasion. Put the paragraphs in the context of successional change and function.
- Insert language about problematic natives. Frame in terms of species composition, balance.
 - Also discuss need to manage natives as well. Native management should be determined by departments.

Management section

- Add prioritization of sites
 - restoration potential
 - Habitat quality- how far is site from goal
 - Dense urban/rural, degree of fragmentation, heaviness of use
 - Remnant native populations
 - Educational value
 - Resource availability
 - Timing/Opportunity for collaboration —————> Having a coordinator would help here
 - Reinforce need for FTE, campaign for position
 - Community value/attachement
 - Potential for follow up
 - Which invasives are present? What are their weed risk scores, have the triggered an alert etc.
 - Are sensitive natives present?
- Rework Prevention/Control/restoration to emphasize prevention of damage.
 - Use invasion resistance to frame. Reduce the need for serious restoration as result of activities.
 - minimize soil disturbance
 - maintain diversity
 - resource availability
 - phasing
 - Add section pertaining to wildfire risk, and to reduce risk
 - Brush management
 - Best practices within scope
 - Public standpoint

Summary of activities section

- add use of volunteers to parks and recreation

Costs

- Annual estimated costs by department and total volunteer costs
- Austin Energy, idea of percentage of total vegetation control
- Total need estimate, average annual
- Volunteer contribution row
- Contract under direct!
- Add public works, remove planning and development review

Costs Implement

- above and over current spending
- additional costs (current, % property per year (ac), \$ per acre, equals forecasted total)
- initial costs (FTE), ultimate costs (\$ x 5), sharing, cost savings, volunteers (Charlie)
- density per area
- cost estimate per tree, etc. (hauling) (Angela)
- Implement/Control Costs (Matt O, Angela, Walter)
- Add introductory language to focus more on a goal of more accurate estimates such as average per work order costs (inventory estimate, city wide estimates) (Walter)
- Cost may be qualitative versus quantitative (Damon)

Funding

- Use matching funds (use of volunteer, public sector) when applying for grants (Damon)
- Add contacts for volunteers organizations (KAB, APF)

Field Resources Book

Consensus decisions

- Organization
 - General management
 - Fact sheet/Management protocol
- Provide separate fact sheet and management sheet protocol documents
- Arrange species by common name
- Weed Risk Assessments moved to Appendix
- Protocols
 - Consolidate references at end
 - Take brand names out of protocols. Create table with active ingredients and brand names.

Discussion

Inclusion of recommended herbicide concentrations in management protocols

Pros	Cons
Additional information for staff	This is a public document, even if not intended for distribution, it will be furnished upon request.
Percentages have been researched	Label is the legal requirement.
Not all departments have IPMs	This is a high level document, detail like this should be at the level of departmental IPMs
	Can be confusing. Need to make clear that the percentage refers to the active ingredient. When

	mix instructions given, be clear that 1 st element is the active ingredient, not the formulation

Alternate language: refer to label and departmental IPM for concentrations

Possible compromises

- Specify dilute versus concentrated solutions
- Identify herbicide product groups

WRA

- The WRA was performed at State level, but can be made to local level
- The recommended review period of the WRA is 5 years
- The WRA should be reviewed by local experts looking at distribution and rate of spread
- The assessments should be updated upon mapping completion, in regards to distribution
- The assessments should match with local field experiences, examples can be quantify tree species distribution or ecotypes invaded vs. ecotypes in area (Walter)
- An Alert means all departments will focus resources on that species.

Attendees:

Working Group Members

John Gleason
Matt McCaw
Chris Sheffield
Walter Passmore (PARD)
Angela Gallardo
Eric Stager
Keith Mars
Charlie McCabe

Wildflower Center Staff

Damon Waitt
Travis Gallo
Michelle Bertelsen
Elizabeth Chapman
Matt O'Toole

Invasive Species Management Plan Working Group
Meeting 8; September 1, 2011

Meeting Goals

1. Review and discuss draft plan structure, deletions, and additions.
2. Review departmental costs, volunteer contributions, and forecasted costs.
3. Review and discuss management protocols. Make a recommendation about preferred structure?
4. Make recommendation about TIPPC and future conference presentation.
5. Review and make recommendation for 'Notice for Comments' posting for Advisory Group
6. Review city process for 'Public Comments' on draft plan. Make recommendation for screening process for comments.
7. Review upcoming activities related to the Plan.

Agenda

- 12:00 Introduction (Matt O'Toole)
Arriving - KAB Representative, Monica Lopez Magee
Meeting Overview (Goals & Agenda)
Review Meeting Notes from 8/15/2011 – any changes?
Review Action Items from 8/15/2011 – updates?
- 12:10 Draft Plan Commentary (Michelle Bertelsen)
- 1:00 Chapter 6, Costs (Matt O'Toole)
Annual Costs, Volunteers Efforts (Table 2.2)
Treatment & Removal Pricing (Angela G.)
Projected Implementation/Control Costs, and Volunteer Efforts (Table)
Other City Departments? Public Works? (Angela G.)
- 1:30 Break (10 or 20 minutes)
- 1:50 Field Resources Book (John G, Matt M, Chris S)
Management Protocols... structure, herbicides, mixtures
- 2:30 TIPPC Conference, COA IPM Presentation (Matt O'Toole)
Future Presentations? Coordinated Product?
Volunteers (Matt O., Angela H.)?
- 2:50 Notice for Comments, Advisory Group (Matt O'Toole)
Federal Register Example
Areas of Plan to focus feedback?
Book 2 Examples (Fact Sheets, Management Protocols, etc.)?
- 3:10 Break (10 or 20 minutes)

- 3:20 Notice for Comments, General Public (Angela Hanson / Walter Passmore)
City Process, Boards & Commissions Update
Screening Feedback, Volunteers?
- 3:40 Next Steps (Matt O'Toole)
Advisory Group Commentary Period (9/19/11)
Book 2 Revision (9/19/11)
Meeting 9 (10/6/11)?
Final Draft - Public Commentary Period (mid-October)
Meeting 10 (late-October)
Submission to COA (late-October)
- 3:55 Wrap-up (Matt O'Toole)
LBJWC Evaluation: 'The Good, the Bad and the Ugly'
- 4:00 Adjourn

Invasive Species Management Plan Working Group
September 1, 2011 Meeting Notes

Action Items

- Michelle B. – Include acknowledgements in plan (COA staff, LBJWC staff, LBJWC Interns, etc.)
- Eric S./Emily K. – Work on cost estimates for Austin Energy/ROW
- Charlie M./Chris S./Monica M./Matt O. – Work on volunteer contribution amounts
- Emily K. – Estimate of PARD ROW costs, monitoring
- Kelly B. – ABIA property management, potential costs
- Matt O. – send register out for review
- Matt O. – Use webpage for advisory document sharing, resource examples, appendices
- Charlie M./Angela H./Kelly B./Michelle B./Matt O. – TIPPC conference abstract submission (9/16), presentation, and panel discussion.
- Emily K. – Check public comment period with Public Information Office
- John G./Chris S./Matt M./Michelle B. – Work on species management example of one aquatic, woody and herbaceous species
- City Rep./LBJWC Rep. – Board Updates, Register on Agenda

Consensus Decisions Made on August 18, 2011

- ✓ The group agreed to edit the ‘Plan Development’ section to current status and upcoming activities, and to include a section of comparison between the Portland and COA Plan.
- ✓ The group agreed to use the pricing table example of estimates from the Shoal Creek project.
- ✓ The group agreed to cost estimates table format, units of costs, and forecasted projection.
- ✓ The protocol sub-group agreed to focus attention on to complete 3 management protocols for a woody, aquatic, and herbaceous species.
- ✓ The TIPPC sub-group agreed to participate in a panel discussion at the November Conference.
- ✓ The group agreed to follow the federal register format for notice of comments to the Advisory Group.

Topics of Discussion

Draft Revisions (Chapters 1-5)

- Edit plan development steps to reflect whatever actually happens in the next stages
- Portland was the only other municipal plan at the start of this process. Call out the differences and areas this plan exceeds that one.
- Reference Urban Forestry plan in development.

Chapter 6, Costs

- Pricing Table
 - based on average costs of Shoal Creek example (5.15 miles, contractor prices).
 - only up to 8” DBH included
- Austin Energy currently monitors costs for Hydrilla, only... 45k.
- Preplanning Groups may catalog (urban forest, parkland, removal vs. trimming)
- Is the tree survey applicable to help direct costs of AE?
- Cost Table:
 - does not include volunteer coordination amount
 - organization participating
 - add subset to table
 - 200 hours of staff time coordination
 - Units should show relationship, not statement of fact
 - Individual chart for each department
 - Explanation of table for different treatments, change in costs, general discussion

- Volunteer contribution by acre or hour? By unit costs (acre, mile).
- 5 year projection, not 100%
- Include the FTE positions in the forecast, annual costs
- Other Departments:
 - Mention other departments in costs section (public library, SWS, etc.)
 - Plan not just applies to involved departments
- Insert brief paragraph explaining why unit costs vary between departments. Factors to consider include
 - Location (rural/urban)
 - Impact on people
 - proximity to homes or businesses
 - Is the space open to the public (always, sometimes, never)
 - Value of site (public visibility/attachment, ecological value)
 - Access
 - Existence or absence of a management plan; has previous management been done?
 - How serious is the infestation? What is the density, high, medium, low?
- Also insert brief explanation of how costs were estimated and the source of the information used.

Field Resources Book

- Simplify
- Clairify
- Use least toxic approach. In some cases do not seem to be.
- Question: Where did general control procedures come from? Answer: primarily from Miller, also from The Nature Conservancy's ESAs. To do: make the source material more apparent.
- Individual department IPMs do not agree and mostly define only general procedures. At some point departments should have 1 IPM per species.
 - Example: Ligustrum: BCP and WQPL use the same 3 chemicals in a different order. The reasons for these decisions should be clarified in the departmental IPMs. Perhaps this plan can serve to stimulate those revisions.
 - For this plan, drop the departmental IPMs from the species protocols because they create confusion. Insert "Check your departmental IPM" or similar on all fact sheets.
 - Work has been done to unify treatment protocols for *Arundo donax*. New chemicals and techniques incorporated.
 - Subgroup will come up with treatment protocol for 3 example species. *Arundo* and two others to be determined (one woody, one herbaceous)
- Insert product table with active ingredient, trade names, and possibly factors to be aware of
- Recommend avoiding soil active chemicals
- Add justifications for why chemicals were chosen or decided against.
- Every sheet should have the disclaimer- Always use herbicide under the direction of a licensed applicator. Follow labels.
- Simplification
 - Currently have small infestation/ large infestation ect. on all sheets. Only call them out if they are different.
 - Cut information not related to treatment
- When little information is available on a species, state that.
- Sheets have potential to highlight current research and relevant projects.
 - Ex. KR-is some research currently showing 500% more chemical is needed in the Edwards Plateau than in the Blackland prairie.
 - *Arundo* project slated to happen?
- Keep trade name only if it is important to treatment-one formulation works better than others. Otherwise use only active ingredient.
- Organize by scientific names, list more common names. Index both ways.

TIPPC Conference

- Dates: 11/8-11/10
- 1 of 2 municipal plans in the country
- Compare other city plans
- Develop bullet points on what's been done
- What's different about this plan
- Potential state model and for other Texas municipalities
- Focus towards panel discussion versus 15 min. presentation

Notice for Comments, Advisory Group

- Tweak Federal Register
- Is the plan in conflict with established procedures?
- Does this build upon current practices?
- Is this plan reasonable and executable?
- Would you support it?
- Submit comments as written response.
- Include one example of management protocol with watermark.

City Process, General Public Comments

- Public comment period occurs during vote; is it necessary?
- Emily K. to check with Pub. Info. Office.

Next Steps

- Memo (Sara Hensley, PARD Director) – Oct.
- Start progress to Asst. City Manager & City Manager
- Board Briefings (update, document review)
 - Urban Forestry (9/21)
 - PARD Board (9/27)
 - Environmental Board (10/5)
 - Water and Wastewater (?)
- Board Actions (comments, letter of support) – next meetings after briefing

The Good, Bad, and Ugly

- Good:
 - Cookies
 - Completion
 - Use of sub-groups
 - Efficient process
 - Well-trained staff
- Ugly:
 - Room
 - Weather

Attendees:

Working Group Members

John Gleason
Chris Sheffield
Emily King (PARD)
Angela Gallardo
Eric Stager
Charlie McCabe

Monica Magee
Kelly Bender

Wildflower Center Staff

Damon Waitt
Travis Gallo
Michelle Bertelsen
Elizabeth Chapman
Matt O'Toole

Invasive Species Management Plan Working Group
Meeting 9; October 10-13, 2011

Meeting Goals

1. Review and discuss Plan comments.
2. Review and prepare for Public Review process.
3. Make recommendation about TIPPC conference presentation.
4. Discuss City activities related to invasive plants and City Review process.
5. Review upcoming activities related to the Plan.

Agenda

- 12:00 Introduction (Matt O'Toole)
Meeting Overview (Goals & Agenda)
Review Meeting Notes from 9/1/2011 – any changes?
Review Action Items from 9/1/2011 – updates?
- 12:10 Plan Commentary (Matt O'Toole)
City Integrated Land Management Plan (John Gleason & A.D. WPD)
Advisory Group Comments
Working Group Comments
FTE(s) Reclassification (Land Management Coordinator/Analyst)
- 1:30 Break (10 or 20 minutes)
- 1:50 Board & Commission, Update & Schedule (Matt O'Toole)
Board Presentation v.2
Environmental Review (10/5 & 10/19)... John/Angela G./Travis
Urban Forestry (10/26)... Angela H./Damon
Parks and Recreation (10/25 & 12/6)... Charlie/Matt O.
Water and Wastewater (11/9 & 12/14)... Matt M./Matt O.
- 2:10 Public Review Process (Matt O'Toole)
Advertisement of Meetings (10/11)
Two Meetings (11/1 & 11/3; 7-8:30pm)
Location (One Texas Center, 505 Barton Springs Rd. Room 325)
Plan Process Presentation
Incorporation of Comments (Meeting 10)
Working Group Preparation, Structure of Meeting
- 2:50 TIPPC Conference, COA IPM Presentation (Angela Hanson & Matt O'Toole)
Schedule (11/9/2011; 9:15-10am)
Format (Presentation or Panel)
Volunteers (City Mgmt., LBJWC Mgmt., Volunteer, IPM Mgmt., Implementation)
- 3:10 Break (10 or 20 minutes)

- 3:20 City Business (Angela Hanson)
Austin Water Utility (Landscape Conversion Incentive)
Daniel White (Proposed Field Trip?)
Disclaimer (PARD PIO)
Submission to City, Document Process (PARD)
- 3:40 Next Steps (Matt O'Toole)
1. Boards and Commission Update/Action
Environmental Review (10/5 & 10/19)... John/Angela G./Travis
Urban Forestry (10/26)... Angela H./Damon
Parks and Recreation (10/25 & 12/6)... Charlie/Matt O.
Water and Wastewater (11/9 & 12/14)... Matt M./Matt O.
 2. Advertisement of Public Meetings (10/11)
 3. Public Meetings (11/1 & 11/3)
 4. TIPPC Conference (11/9)
 5. COA IPM Meeting #10 (11/14-11/18; Final Meeting)
Public Commentary
Field Resources Book
 6. Submission to City (11/23)
- 3:55 Wrap-up (Matt O'Toole)
LBJWC Evaluation: 'The Good, the Bad and the Ugly'
- 4:00 Adjourn

Invasive Species Management Plan Working Group
October 10, 2011 Meeting Notes

Action Items:

1. Angela G. – check ABIA land management program
2. Matt O. – send plan to all Directors, Cc: others
3. John G. / Angela G. – update on FTE meeting
4. John G. / Angela G. – Integrated Land Management Plan and FTE language
5. Interdepartmental Group (Executive Committee) – objectives of FTE's, performance measures, charter MOU between departments about FTE
6. Travis / Damon – seek out-of-state support
7. Matt O. – explore Portland cost savings of Plan
8. Angela G. – HB338 disclaimer
9. Angela H. – Minn. Dept. of Conservation, soil protection guidelines
10. John G. – inquire of Mark Baker comments to plan
11. Angela G. – check with Willie (Water/Waste) about board meetings
12. Matt O. – comment forms for city
13. John G. – inquire about AWU incentive program
14. Angela H. – city web address
15. Travis – WRA table column definitions
16. Matt O. – Send announcement to all
17. LBJWC – Acknowledgement page in plan
18. LBJWC – HB 338 Disclaimer on Fact Sheets, only

Consensus Decisions Made:

- ✓ The group agreed to place language about integrated land management plan and FTE reclassification into the IPM plan.
- ✓ Include comments from Mark Simmons in the plan.
- ✓ Include comments from Jerry Cook in the plan.
- ✓ HB338 Disclaimer for Fact Sheets.
- ✓ Include comments from Mark Baker
- ✓ Incorporate outreach component into plan about Michelle's comments.
- ✓ Agreement to public comment process
- ✓ Agreement to the TIPPC conference process and attendance

Topics of Discussion:

Integrated Land Management Plan (Mike Personett)

- Initial meeting of WPD, PARD, and Sustainability Office
- New Plans
 - Water Protection Ordinance
 - Green Infrastructure Team
 - Land Management Ordinance
- WPD to host proposed FTE position (2) beginning FY2013
 - Using drainage utility fund
 - Change function title to Environmental Conservation Coordinator and GIS Analyst
- Sustainable Action Agenda
 - Highlight key initiatives, expectations
 - Sustainable, integrated Land Management Plan
 - Plan stand alone vs. greater network (see illustration)
 - Q1: Are elements independent of one another?

- Q2: Is a more comprehensive framework needed (unified plan, interdepartmental umbrella)?
- Sponsored by Assistant City Manager (Executive)
- Comments:
 1. Charlie: Suggests the ordinance provide public access process to be managed by volunteers.
 2. Mike: Focus of land acquisition in East Austin, open space.
 3. Travis: Completion date?
 4. Angela H: Suggests maintaining mission and focus of FTE's (invasive species).
 5. Keith M: Stress the IPM is a binding document and departments have to buy-in.
 6. Mike: Suggest creating interdepartmental charter, sponsored by ACM
 7. Damon: Establish a MOU between departments about invasive plan and use of the FTE's, and establish annual work plan.
 8. Keith: Stress that the plan is unrealistic without FTE coordinator versus interdepartmental coordination.

Plan Comments

- Environmental Board Support
- Texas Nursery and Landscape Association
- Unofficial TIPPC
- Kathy Trizna (HB 338 Disclaimer)
- Daniel White; no field trip
- Mark Simmons: Johnsongrass language, Table 4.5.2 column definitions, invasive/site hygiene language
- Mark Baker (purpose): address eradication... where possible eradicate; control and reduce are measurable
- Jerry Cook: plant oriented plan, sources for validation/crew identification (UT Plant Resource Center, LBJWC, TPWD (Poole), TNC (Carr))
- Michelle B: resources for landowners adjacent to parks (ex. Large volumes of invasive plant material)
 - Charlie: coordinate workdays, plan serves as basis, incorporate idea into plan (outreach component)

Boards and Commission Update

- Environmental Review Board
 - Complete, Letter of Support
 - Cost Projection
 - Projection as is
 - Plan will reduce costs through coordination
 - Estimate cost savings/% reduction over years, through coordination
 - AE should alter practices (invasive treatment)
- Urban Forestry (10/26)
- Parks (11/4 & 12/6)
- Water/Wastewater (TDB)

Public Comment Process

- Introductory presentation (Matt O.): educate, snap shots, economies, fact sheets, FTE's
- Q & A Session (verbal comments)
- Written comments (form)
- Attendance: all COA employees, Charlie (11/1), Chris (11/3), Travis (out)

TIPPC Conference

- Panel discussion

- Introductory presentation
- Q&A
- Attendees:
 - Matt O. (moderator, LBJWC)
 - Angela H. (city mgmt)
 - Angela G. (database)
 - John G. (IPM coordinator)
 - Matt M. (restoration, land management)
 - Charlie M. (volunteer)
 - Michelle B. (document management, LBJWC)

AWU Landscape Incentive Program

- Approach Sustainability Office
- Lack of communication
- John G. to communicate with AWU about incentive program and use of Bermudagrass

Attendees:

Working Group Members

John Gleason
Chris Sheffield
Angela Hanson
Angela Gallardo
Charlie McCabe
Keith Mars

Wildflower Center Staff

Damon Waitt
Travis Gallo
Michelle Bertelsen
Matt O'Toole

**Invasive Species Management Plan Working Group
Meeting 10; November 17, 2011**

Meeting Goals

1. Review and discuss codification process.
2. Review and discuss remaining Advisory Group and Public comments.
3. Review and discuss EDDMaps & Texas Invasives.
4. Review and finalize approved herbicide table.
5. Review and discuss brush management guidelines.

Agenda

- 1:00 (10min) Introduction (Matt O'Toole)
Meeting Overview (Goals & Agenda)
Review Meeting Notes from 9/1/2011 – any changes?
Review Action Items from 9/1/2011 – updates?
Update – TIPPC Conference, Board and Commissions... complete
- 1:10 (20min) 'Codifying the Plan' (Angela Hanson & April Thedford)
- 1:30 (40min) Additional Advisory & Public Commentary (Michelle Bertelsen)
- 2:10 (20min) Break
- 2:30 (30min) WIMS & Texas Invasives Database (Angela Gallardo)
- 3:00 (30min) Herbicide Table (Matt O'Toole)
- 3:30 (20min) Brush Management Guidelines (Angela Hanson)
- 3:50 (20min) Break
- 4:10 (30min) Next Steps (Matt O'Toole)
Remaining Funding Use
Last Working Group Revision (11/18/2011 - 11/21/2011)
Plan Submission to City (11/23/2011)
How to Review/Edit Fact Sheets & Management Protocols (Sub-group or All?)
Field Resources Book Submission (11/28/11 – 12/2/2011)
- 4:40 (10min) Wrap-up (Matt O'Toole)
LBJWC Evaluation: Please evaluate us!
- 4:50 Adjourn
Santa Rita Cantina (Phone: 512.288.5100)
Escarpment Village
5900 W. Slaughter Ln.
Austin, Texas 78749

Invasive Species Management Plan Working Group
November 17, 2011 Meeting Notes

Action Items:

1. **Angela G. / John G.** – cover letter to attach to plan for submission to city
2. **All** – council meeting (1/26/2012)
3. **Angela H.** – council presentation, panelist available
4. **City Staff** – wish list to Angela H. by 12/30/2011
5. **LBJWC** – change city deadline language to 1/1/2013
6. **Damon** - * language for Bermudagrass (WRA Table)
7. **Matt M. / John G./Damon** – language for scope and fact sheet (varieties and cultivars)
 - a. This applies only to this species, not including...
8. **LBJWC** – 24 species to TNLA for cultivar/variety listing
9. **Matt M. / Angela H.** – minimum standards (law & dept. policy) for herbicide use
 - a. Legal requirements
 - b. Records requirements
 - c. Department policy
 - d. TDA form
 - e. Don Renchie (AgriLife)
10. **Matt M. / Angela H.** – WIMS testing with Angela G.
11. **Angela H.** – cover letter and adjust language for brush management appendix
12. **LBJWC** – create and cite appendix for brush management document
13. **LBJWC** (2012) – proposal for city training on plan, field resources, Texas invaders, WIMS, calculator
14. **City Staff** – general numbers for training attendance
15. **LBJWC** – plan to staff on 11/21/11
16. **Staff** – plan to LBJWC on 11/28/11
17. **LBJWC** – final plan to staff on 12/2/11
18. **LBJWC** – final book 2 to staff on 12/16/11
19. **Staff** – final meeting on 1/2012, optional for LBJWC and others

Consensus Decisions Made:

- ✓ Staff will provide wish-list and budget requirements to Angela H. by 12/30/2011
- ✓ Add note Bermudagrass Fact Sheet acknowledging that
- ✓ For genera like *Ligustrum*, *Tamarisk*, *Nandina* which contain multiple species that are considered invasive, the single species that was evaluated in the weed risk assessment will be listed at the top of the Fact Sheet. It will be stated elsewhere, that multiple species in this genus may be considered invasive and those species will be listed.
- ✓ A statement will be included in the scope section that communicates that we are hopeful this plan, through education and outreach, will influence outside groups such as state entities, homeowners and business owners, especially those that operate within the City of Austin.
- ✓ Consensus responses to commentary are found below
- ✓ Invasive species management is one part of land management. This idea will be clarified in the context that this plan will eventually fit into several larger plans currently in development for the city (land management, fire management, brush management). This plan is not intended to be a comprehensive land management plan.
- ✓ This plan will not discuss invasive management in terms of fire mitigation. This plan will fit into the fire management plan being developed for the city.
 - Slash management will be noted as a consideration in both fire mitigation and invasive species management. Preliminary guidelines developed for PARD will be included for reference.

- ✓ The difference between exotics (non-native) and exotic invasives (non-native AND cause harm) will be clarified in the plan. Not all non-natives are invasive.
- ✓ Total cost table will be clarified, separating direct cost to the City from volunteer contribution. Footnote will state that volunteer contribution is an in kind contribution.
- ✓ Plan will the conditions under which volunteers may be allowed to perform such actions as herbicide application and chainsaw use. This will occur only under limited circumstances and with training (TDA and City), appropriate licensing, supervision and demonstration of responsible behavior.
- ✓ Plan will make clear in regards to herbicide that
 - No one can apply herbicide without meeting Texas Department of Agriculture requirements. These requirements will be spelled out for employees, contractors and volunteers
 - When TDA requirements are met, departmental protocol will determine if volunteer use of herbicide is appropriate. This means that even if TDA requirements are met, the department may still disallow volunteer use of herbicide.
- ✓ Complete Herbicide table, without surfactants, at the conclusion of species management protocols.
- ✓ Create appendix regarding APRD brush management, citing appendix in plan.
- ✓ Staff decided to investigate use of remaining funding towards staff (& select volunteers) training of plan, resource book, and tools associated with IPM.

Topics of Discussion:

“Codifying the Plan” (April Thedford, PARD)

- Staff create a ‘wish-list’ for the plan
 - Based on 5-year goals
 - Give specific recommendation for Council
 - “Our recommendations are the following...”
- Options
 - Create FDU# for budget
 - Under coordinator control
 - Directed to departments
 - Create budget to implement plan
 - Create object code for purchasing of chemicals (pesticides)
 - Wish-list ideas
 - Tools
 - Contractors (arborists, chipping, etc)
 - Chemicals for volunteers
 - Public education
 - Public survey
- Creating a budget (annual)
 - Departmental forecasted costs
 - Costs of 2 FTE’s
 - Wish-list
 - Monitoring & mapping
 - Training (staff & volunteers)
 - Travel, etc.
- Council deadline (1/26/2012)
 - Provide plan 2 weeks prior
 - Plan, Field Resource Book, Group recommendations, Informational video (?), Panel video (?)
 - 20-minute briefing

- 10-30 minute Q&A

Remaining advisory group commentary

- Texas Nursery and Landscape Association
 - Comment summary: Sterile varieties and cultivars of some of the species listed exist and could be used without the ensuing damage.
 - Discussion
 - Using sterile varieties causes confusion
 - Need a list of things not to use, which includes cultivars and varieties.
 - Even if varieties are sterile, many of these species spread vegetatively
 - Stakeholder Response
 - Insert language into scope plan clarifying that this plan operates at the species level, varieties and cultivars are not addressed. Cultivars and varieties will be assessed on a case by case basis.
 - The species list will be sent to TNLA with the request that they identify the species with documented sterile cultivars or varieties and provide us with documentation.
 - On fact sheets of species identified by TNLA as having documented sterile varieties/cultivars, state that this fact sheet applies to this species with the exception of known sterile cultivars or varieties.
 - The city will not use sterile cultivars or varieties of identified species.
 - Comment: Stakeholder Response
 - Change plan wording from “non-native ornamental” to “non-native exotics”, to clarify that this plan acknowledges that non-native exotic species exist that are not invasive.
- Native Plant Society of Texas
 - *“Limit the definition of invasive to the biological attribute alone. Conflating "invasive" with "non-native" may a) lead to public confusion, b) limit the City's ability to control native, invasive plants (e.g., when trumpet creeper roots threaten a swimming pool), c) perpetuate scientific confusion, since there is little agreement among experts on how far from Austin a plant may originate and still count as "native" (silver ponyfoot? agaves? Ponderosa pine? sweetgum? Sabal mexicana? bois d'arc?).”*
 - Stakeholder response
 - Provide the reasoning for choosing this definition by referring to the meeting notes that contain them (meeting X).
 - The plan acknowledges that native species need to be managed as well.
 - *“As mentioned last night, I'd encourage the Committee to use a different common name for the invasive cat claw vine (Macfadyena unguis-cati) to avoid confusion with the similarly-named but nicely-behaved native cat briar (Smilax bona-nox).”*
 - Stakeholder response
 - Multiple common names will be included in fact sheets.
 - Scientific names are included to eliminate this type of confusion
 - *“I think a statement should be written in the text of the discussion at the beginning of the plan that most invasives on public land originate from private properties – either residential or commercial. This will be especially true once January rolls around and Austin departments are prohibited from planting invasive species.”*
 - Stakeholder response
 - The plan states in the “What is an invasive” section that invasives are generally introduced by people, intentionally or unintentionally.
 - *“Second, food for thought and the public record (not that your group can address this): one way to be pro-active about prevention is to set requirements for residential*

developers. I believe some requirements already apply to commercial properties as it appears that many use native species. Austin needs to consider requiring residential developers (of whole neighborhoods) to exclude invasive species. (This would work better in rural county areas, of course. But there could be a potential on city edges for something like this.)”

- See public comment
- “Finally – regarding the list of invasive species – why do we only include *Ligustrum lucidum* and not all species of *Ligustrum*? How many different *ligustrums* are available from nurseries? *Ligustrum japonicum*, *Ligustrum sinense*, *Ligustrum vulgare* are some that come to mind. Why can’t we just say *Ligustrum spp.*?”
- Stakeholder response
 - *L. lucidum* is the species the weed risk assessment was run for
 - The plan will acknowledge that some genera contain multiple species that are considered invasive, though it was not possible for this iteration of the plan to run weed risk assessments on all possible species.
 - On the fact sheet, the species that were assessed in the weed risk assessment will be identified in the title. That other possible invasive species exist within the genus will be acknowledged elsewhere on the sheet.

Discussion of remaining public comment

Public comment was categorized to allow for meaningful discussion. Full text of public comment was provided to stakeholders in advance of the meeting.

- Why is this plan not attempting to influence entities outside of the city (asking local businesses not to sell invasives, influencing TXDOT, requiring landowners to manage invasive species etc.).
 - Stakeholder response
 - Such action is outside the scope of this plan
 - Education and outreach are the primary vehicles through which outside groups will be influenced
 - Plan will list primary stakeholder that will be targeted. And a statement will be included that states “We are hopeful this plan, through education and outreach, will influence outside groups such as state entities, homeowners and business owners, especially those that operate within the City of Austin.
 - Voluntary and cooperative initiatives may be developed down the road, using this plan as a starting point, but laying out the parameters of those initiatives is premature and beyond the scope of this planning document.
 - Program coordinator will investigate these opportunities, but the focus will remain on education.
 - State law prohibits municipalities from restricting the planting, sale or distribution of noxious or invasive plant species. See below:

Texas Agriculture Code CHAPTER 71

SUBCHAPTER D. NOXIOUS AND INVASIVE PLANTS

Sec. 71.153. LOCAL REGULATION

- (a) A political subdivision may not adopt an ordinance or rule that restricts the planting, sale, or distribution of noxious or invasive plant species.
- (b) This section does not limit the preparation and distribution of educational materials relating to plants of local concern.

Added by Acts 2005, 79th Leg., Ch. 618, Sec. 4, eff. September 1, 2005.

- Why weren't more specific BMPs for restoration developed?
 - Stakeholder response
 - The importance of post treatment management is stated
 - The plan places emphasis on prevention, minimization of treatment impacts to the greater ecosystem and on managing land for invasion resistance. Together, this should reduce the need for intensive restoration.
 - Restoration is site specific. It is not feasible to develop strategies for every landscape and situation that will be encountered by managers within the City. Restoration plans must be developed for each project driven by site specific conditions and goals.
 - Invasive management is one piece of land management. A larger sustainable land management plan is being developed for the City, and this invasive management plan will fit into that larger plan.

- Should we discuss invasive management in terms of fire mitigation?
 - Pros:
 - Money & momentum
 - Invasive management does support fire management in some cases
 - Cons
 - Fire management is a separate and complex issue
 - Both invasive and non-invasive species influence fire risk and fire behavior
 - A fire management plan for the City is in development
 - Decision: No, this plan will not discuss invasive management in terms of fire mitigation. This plan will fit into the fire management plan being developed for the City.

- Aren't some invasive species useful? Should useful invasives be treated differently?
 - Stakeholder response
 - Usefulness and value to community of individuals is taken into account in the prioritization process.
 - In terms of ecological value, a diverse native plant community will support more wildlife species than a non-native monoculture and will frequently be more functional ecologically.
 - The difference between exotics and invasives will be clarified in the plan

- Sustainable funding. Have we fully explored our options?
 - Stakeholder response
 - This issue has been explored. It will continue to be explored as the plan is implemented.
 - See funding section

- Should the City be supporting/performing research in biocontrol? Does that discussion belong here?
 - Stakeholder response
 - That discussion is beyond the scope of this planning document. It is a topic that may be considered over time, but cannot be fully explored here.

- How was the value of volunteer hours established? Are volunteer organizations compensated based on that estimate? Are the values for volunteer time in this report a direct cost to the city?
 - Stakeholder response

- The source of the hourly estimate for volunteer time is cited in the report and this value is considered a national standard.
 - Volunteer contributions are not a direct cost to the City
 - See Austin Parks Foundation response to “Do volunteer organizations received funding from the City”.
 - Total cost table will be clarified, separating direct cost to city from volunteer contribution. Footnote will state that volunteer contribution is an in kind contribution- that is it is a donation of time, not money. Monetary value is assigned to facilitate comparison between direct costs and volunteer contributions. i.e. how much would it have cost the city to perform the work that was contributed by a volunteer.
- Why are we using herbicide in some situations? Why are we recommending IPM?
 - See section 1.4
- Should volunteers be allowed to use herbicide/chainsaws etc.? Under what conditions?
 - Stakeholder response
 - Only under limited circumstances and with training (TDA and City), appropriate licensing, supervision and demonstration of responsible behavior.
 - Plan will make clear in regards to herbicide that
 - No one can apply herbicide without meeting Texas Department of Agriculture requirements. These requirements will be spelled out for employees, contractors and volunteers
 - licensing requirements (type and category) for employee, contractor & volunteer on public lands
 - record keeping requirements
 - When TDA requirements are met, departmental protocol will determine if volunteer use of herbicide is appropriate. This means that even if TDA requirements are met, the department may disallow volunteer use of herbicide.

Other discussion

- Bermudagrass discussion
 - Currently used in many city properties
 - Is an option in a current standard specification
 - Not feasible to remove from properties at this time
 - Putting in an exception at this point could weaken the plan
 - Options:
 - remove from the top 24 list for this iteration of the plan, while continuing to evaluate it on the species level and on the cultivar/variety level for the next iteration of the plan.
 - keep it in the top 24 list, with a comment on the fact sheet noting possible exceptions.
 - Decision: Keep Bermudagrass in the top 24 list, with an exception statement
- Lumping multiple species
 - Ligustrum, Tamarix spp.
 - Decision: On fact sheet title list specific species that was reviewed in the weed risk assessment. Somewhere else on the fact sheet list the other species in the genus that are considered invasive.

WIMS & Texas Invaders Database (Angela Gallardo)

- Update on WIMS
 - Create a name
 - Add field for pesticides, application rates (TCEQ Meeting)
 - Importing tables on Monday
 - Used by staff and select volunteers
- Texas Invaders
 - Used by volunteers
 - Incorporated into EDDMaps application
 - Qualifier for city lands

Herbicide Table

- Process
 - Complete fact sheet and management protocols of Book 2
 - Adjust herbicide table to those used on 24 species
 - Completely remove those herbicides dealing with soil spots
 - Do not include surfactants in table

Remaining Funding (\$13k)

- Requires PARD approval & within scope of work
 - Options
 - Baseline mapping & monitoring
 - Completion of fact sheets and management protocols
 - Training for staff of plan, book 2, WIMS, and Texas Invaders tools
 - Travel to conferences (ex. NPS-Urban Invasives Project)
 - Training (introduction and implementation)
 - Plan, resource book, and other tools
 - Training managerial staff » staff train staff and volunteers on tools
 - LBJWC and city staff provide training

Attendees:

Working Group Members

John Gleason
 Chris Sheffield
 Angela Hanson
 Angela Gallardo
 Eric Stager
 Kelly Bender
 Matt McCaw

Wildflower Center Staff

Damon Waitt
 Michelle Bertelsen
 Matt O'Toole



City of Austin Invasive Species Management Plan

Appendix D



Response to Advisory Group commentary

Stakeholders reviewed all commentary, using a consensus based process to determine appropriate plan modifications. Below is a summary of stakeholder response to advisory group commentary.

Texas Nursery and Landscape Association (TNLA)

Comment summary: Sterile varieties and cultivars of some of the species listed exist and could be used without the ensuing damage.

Stakeholder Response

- Insert language into scope plan clarifying that this plan operates at the species level. Varieties and cultivars are not addressed. Cultivars and varieties will be assessed on a case by case basis.
- The Top 24 species list will be sent to TNLA with the request that the organization identify the species with documented sterile cultivars or varieties and provide the Working Group with documentation.
- Fact sheets of species identified by TNLA as having documented sterile varieties/cultivars will have a statement inserted acknowledging that this fact sheet applies to this species with the exception of known sterile cultivars or varieties.
- The city will not use sterile cultivars or varieties of identified species.
- Change plan wording from “non-native ornamental” to “non-native exotics”, to clarify that this plan acknowledges that non-native exotic species exist that are not invasive.

Native Plant Society of Texas

Comment summary (1): Limit the definition of invasive to the biological attribute alone to avoid conflating non-native and invasive.

Stakeholder response

- Reasoning behind the selection of the definition used can be found in the meeting notes.
- The plan acknowledges that native species need to be managed and that not all non-native species are invasive.

Comment summary (2): Use a different common name for cat claw vine (*Macfadyena unguis-cati*) to avoid confusion with cat briar (*Smilax bona-nox*).

Stakeholder response

- Multiple common names will be included in fact sheets.
- Scientific names are included to eliminate this type of confusion

Comment (3): *“I think a statement should be written in the text of the discussion at the beginning of the plan that most invasives on public land originate from private properties – either residential or commercial. This will be especially true once January rolls around and Austin departments are prohibited from planting invasive species.”*

Stakeholder response

- The plan states in the “What is an invasive” section that invasives are generally introduced by people, intentionally or unintentionally.

Comment (4): *“Second, food for thought and the public record (not that your group can address this): one way to be pro-active about prevention is to set requirements for residential developers. I believe some requirements already apply to commercial properties as it appears that many use native species. Austin needs to consider requiring residential developers (of whole neighborhoods) to exclude invasive species. (This would work better in rural county areas, of course. But there could be a potential on city edges for something like this.)”*

- See public comment

Comment (5): *“Finally – regarding the list of invasive species – why do we only include *Ligustrum lucidum* and not all species of *Ligustrum*? How many different *ligustrums* are available from nurseries? *Ligustrum japonicum*, *Ligustrum sinense*, *Ligustrum vulgare* are some that come to mind. Why can't we just say *Ligustrum spp.*?”*

Stakeholder response

- *L. lucidum* is the species the weed risk assessment was run for
- The plan will acknowledge that some genera contain multiple species that are considered invasive, though it was not possible for this iteration of the plan to run weed risk assessments on all possible species.
- On the fact sheet, the species that were assessed in the weed risk assessment will be identified in the title. That other possible invasive species exist within the genus will be acknowledged elsewhere on the sheet.

Sam Houston State University

Comment summary: The plan does not sufficiently address animal pests, which are important ecological pests. The species identification validation network should be established and stated in the plan

Stakeholder response

- The group acknowledges the importance of non-plant pests and the plan was constructed so that additional groups could be included in future iterations.. However, this group was tasked with the creation of an invasive plant management plan.
- The validation network will be established and stated

O'Toole, Matthew D

From: Baker, Mark <Mark.Baker@austintexas.gov>
Sent: Thursday, October 06, 2011 4:52 AM
To: O'Toole, Matthew D
Cc: McKown, OB
Subject: Invasive Species Management Plan

Mathew,

Thanks for sending me the documents that I was having trouble downloading from your site. It turns out I just needed to update the Adobe add-on in my browser.

Has the plan gone through COA internal review? I can think of several City disciplines that might have input.

The 4/8/10 resolution directed the City Manager to report to Council by 6/5/10. I'm guessing this was met by the 6/3/10 memo from Directors of the 3 Departments.

The 6/3/10 memo restates the purpose as "control and/or eradication" yet your plan states "reduce the cover and expansion". The 10/18/10 Executive meeting #1 notes states "provide a guideline" and the 2/10/11 IPM Working Group expectations document uses terms of "appropriate response" and "education" in the stated purpose. I wasn't able to find any further discussion of the purpose in the working group meeting notes. To me the purpose is the most important part of the plan and the process and that it should be stated up front.

Keith Mars represented my department on the Working group. I can follow up with him for other details.

Thank you,
Mark Baker, Environmental Review Specialist Senior
(512)974-6356 Office (512)751-6396 Mobile

O'Toole, Matthew D

From: Leslie Bush <leslie.bush@gmail.com>
Sent: Wednesday, November 02, 2011 8:25 PM
To: O'Toole, Matthew D
Cc: Meg Inglis; Kathy Trizna; Waitt, Damon E
Subject: City of Austin Invasive Species Management Plan (Request for Comments)

Matt,

It was nice to meet you last night at the Public Comment session for the COA Invasive Species Management Plan. I realize the stakeholders' comment period has long expired, but you graciously indicated last night that you would still accept input and make sure it reaches the appropriate source.

The LBJWC is specifically seeking comment on the following:

1. Based on your experiences with national, state, local, and departmental Invasive Species Management Plans, is this plan in conflict with established procedures?

Not for any City land I've been involved with.

2. After reviewing the plan and accompanying material, does this plan build upon current practices?

As far as I know.

3. After reviewing the plan and accompanying material, is this plan reasonable and executable at the municipal level?

As far as I know.

4. What are this plan's greatest strengths?

Targets for removal specific plants that are of limited value to wildlife and humans (and that may, in the long run, devalue City property if they are allowed to run riot on City land and waters). The City's identification of such invasive plants will raise awareness of their problematic nature among the general public, and, it is hoped, lead Citizens to choose higher-value plants on private lands.

5. What are this plan's greatest weaknesses?

Currently, there is no easy-to-understand summary of the Plan.

6. What would you change about this plan?

Limit the definition of invasive to the biological attribute alone. Conflating "invasive" with "non-native" may a) lead to public confusion, b) limit the City's ability to control native, invasive plants (e.g., when trumpet creeper roots threaten a swimming pool), c) perpetuate scientific confusion, since there is little agreement among experts on how far from Austin a plant may originate and still count as "native" (silver ponyfoot? agaves? Ponderosa pine? sweetgum? Sabal mexicana? bois d'arc?).

7. Would you support this plan 1) as is, 2) with minor changes, 3) with major changes, or 4) I would not support this plan?

Support the plan with minor changes.

8. General comments.

As mentioned last night, I'd encourage the Committee to use a different common name for the invasive cat claw vine (*Macfadyena unguis-cati*) to avoid confusion with the similarly-named but nicely-behaved native cat briar (*Smilax bona-nox*). Several common names are given here:

http://www.hear.org/pier/species/macfadyena_unguis-cati.htm Perhaps simply use the genus name or a direct translation from French patte d'oiseau (bird-leg) or Spanish paz y justicia (peace and justice)?

Also, you may wish to add the Native Plant Society of Texas and the Native Praire Society to lists of volunteer organizations upon whom the City can call in the implementation of the Plan.

With thanks for your work on this project,
Leslie Bush

--

Leslie L. Bush, Ph.D., R.P.A
Macrobotanical Analysis
12308 Twin Creeks Rd., #B-106
Manchaca, TX 78652

leslie@macrobotanicalanalysis.com

(512) 217-8288

www.macrobotanicalanalysis.com

Untitled

From: Lonnie Childs <lchester@beecreek.net>
Subject: FW: City of Austin Invasive Management Plan
Date: October 17, 2011 10:37:09 PM CDT
To: <dwalett@wildflower.org>
Cc: <carol@felmandesign.com>, Meg Inglis <plantnative07@austin.rr.com>

Damon,
Looks like a significant step forward! I'm copying Carole Feldman, our new NPSOT of Advocacy, and Meg Inglis, Austin NPSOT Chapter President, to see if we can't rally some troops to attend the public meetings.
Thanks for the heads-up.

Lonnie Childs
NPSOT President

O'Toole, Matthew D

From: Cook, Jerry <BIO_JLC@SHSU.EDU>
Sent: Friday, October 07, 2011 11:20 AM
To: O'Toole, Matthew D
Cc: Waitt, Damon E
Subject: invasive species management plan

Sorry I am late answering this I have been overwhelmed lately by things that need to be finished yesterday. Unfortunately I do not have a page by page review, but I do have a couple of general comments for your consideration. I have read the entire document and I think it is very well written. The background information is great and the plan appears to be sound. My only concern is that it is very plant oriented. I agree that there are many important invasive plants and that ecologically (even considering urban ecology) plants are a cornerstone of the ecology, but animals (from insects and worms to feral hogs) are important economic and ecological pests also. For example, a new leafhopper has recently been found near San Antonio that attacks grasses. This is its first introduction into the continental U.S., but the fact that it attacks grasses could be serious to the ecology including urban ecology. So, my main criticism is that it does not deal with animal pests sufficiently. A more minor criticism is in the early detection and rapid response section. It would be assuring to know who and how species identifications will be made. There are obviously good resources for this validation and I think this network should be established and stated in the plan. Again, I do not want to diminish the great work that has been done on this plan. It is very professional and well planned, but I think omissions I bring up could be important to this being a functional plan to deal with invasive species in general.

Best wishes,
Jerry

Jerry L. Cook, Ph.D.
Associate Vice President for Research
Interim Dean, College of Sciences
Sam Houston State University
Huntsville, TX 77341-2448

Untitled

On 10/18/11 10:10 AM, "fel dmandesi gn" <carol@fel dmandesi gn. com> wrote:

Everyone,

I am delighted to see this, and certainly want to support with all that NPSOT can give. I'm not sure of my availability for the meetings, but I will certainly review and provide comments. It would be ideal for Austin to pass this and become a leader and example for our other Texas cities.

Thank you Meg, for jumping in -- you might consider yourself a representative for all of NPSOT also, with your position on the NPSOT Advocacy Committee. You will have to determine whether being a local or statewide representative carries more weight in this case.

Carol

Carol Feldman
Landscape Architect
Feldman Design Studios
P.O. Box 832346
Richardson, TX 75083-2346

O'Toole, Matthew D

From: Meg Inglis <plantnative07@austin.rr.com>
Sent: Wednesday, November 02, 2011 10:58 AM
To: Angela Hanson; O'Toole, Matthew D
Cc: Angela Gallardo; Waitt, Damon E; Jessica Wilson; John Gleason; Matt McCaw; Bertelsen, Michelle M; Kathy Trizna; Leslie Bush; Cynthia Maguire; Lonnie Childs; feldmandesign
Subject: Austin Invasive Species Mgmt Plan

Angela and Matt -

Thanks for the opportunity last night to comment on the Austin Invasive Management Plan. The Austin Native Plant Society was well represented at the meeting, and I believe I can speak for Kathy Trizna and Leslie Bush to say that all three of us are impressed with the plan overall and wholeheartedly support it.

After further thought, I have two comments and a question to officially register:

Two comments have to do with prevention of invasives in the first place, which is critical to the success of this program:

First, I think a statement should be written in the text of the discussion at the beginning of the plan that most invasives on public land originate from private properties – either residential or commercial. This will be especially true once January rolls around and Austin departments are prohibited from planting invasive species.

Granted, the scope of this plan excludes residential and commercial properties, but Austin residents must eventually understand the origin of the problem. The more this information is distributed, the better the understanding and the greater our chances of preventing “invasive invasions.” It doesn’t hurt, and may help in the long run, to add some verbiage to this effect.

Second, food for thought and the public record (not that your group can address this): one way to be pro-active about prevention is to set requirements for residential developers. I believe some requirements already apply to commercial properties as it appears that many use native species. Austin needs to consider requiring residential developers (of whole neighborhoods) to exclude invasive species. (This would work better in rural county areas, of course. But there could be a potential on city edges for something like this.)

Finally – regarding the list of invasive species – why do we only include *Ligustrum lucidum* and not all species of *Ligustrum*? How many different ligustrums are available from nurseries? *Ligustrum japonicum*, *Ligustrum sinense*, *Ligustrum vulgare* are some that come to mind. Why can’t we just say *Ligustrum* spp.?

Can this count as official public comment, or do I need to also fill out the comment card from last night and send it in?

Thanks ahead for your feedback.

Meg Inglis
President, Austin NPSOT
512-589-1316

O'Toole, Matthew D

From: Cynthia Maguire <cynthia.maguire@verizon.net>
Sent: Wednesday, November 02, 2011 7:10 PM
To: 'Meg Inglis'; 'Angela Hanson'; O'Toole, Matthew D
Cc: 'Angela Gallardo'; Waitt, Damon E; 'Jessica Wilson'; 'John Gleason'; 'Matt McCaw'; Bertelsen, Michelle M; 'Kathy Trizna'; 'Leslie Bush'; 'Lonnie Childs'; 'feldmandesign'
Subject: RE: Austin Invasive Species Mgmt Plan

Great report, Meg. Thank you to everyone who turned out in Austin last night. Sounds like real progress is possible on this one.

Cynthia Maguire
Immediate Past President, Native Plant Society of Texas
NPSOT State Office 830.997.9272
Cell 940.594.6555

The mission of the Native Plant Society of Texas is to promote the conservation, research and utilization of the native plants and plant habitats of Texas, through education, outreach and example.

www.npsot.org

From: Meg Inglis [mailto:plantnative07@austin.rr.com]
Sent: Wednesday, November 02, 2011 10:58 AM
To: Angela Hanson; Matt O'Toole
Cc: Angela Gallardo; Damon Waitt; Jessica Wilson; John Gleason; Matt McCaw; Michelle Bertelsen; Kathy Trizna; Leslie Bush; Cynthia Maguire; Lonnie Childs; feldmandesign
Subject: Austin Invasive Species Mgmt Plan

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After further thought, I have two comments and a question to officially register:

Two comments have to do with prevention of invasives in the first place, which is critical to the success of this program:

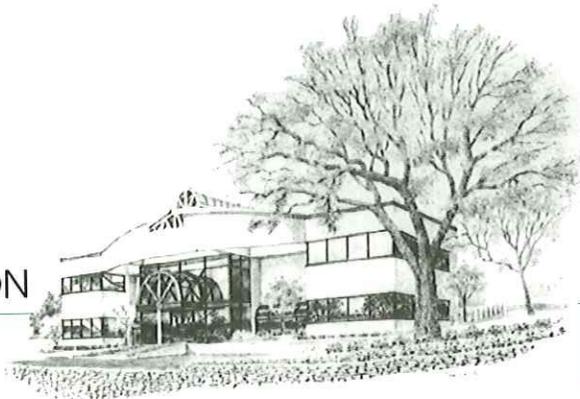
First, I think a statement should be written in the text of the discussion at the beginning of the plan that most invasives on public land originate from private properties – either residential or commercial. This will be especially true once January rolls around and Austin departments are prohibited from planting invasive species.

Granted, the scope of this plan excludes residential and commercial properties, but Austin residents must eventually understand the origin of the problem. The more this information is distributed, the better the understanding and the greater our chances of preventing “invasive invasions.” It doesn't hurt, and may help in the long run, to add some verbiage to this effect.

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Finally – regarding the list of invasive species – why do we only include *Ligustrum lucidum* and not all species of *Ligustrum*? How many different *ligustrums* are available from nurseries? *Ligustrum japonicum*, *Ligustrum sinense*, *Ligustrum vulgare* are some that come to mind. Why can't we just say *Ligustrum* spp.?

TEXAS NURSERY & LANDSCAPE ASSOCIATION



October 10, 2011

Mr. Matt O'Toole:

We appreciate the opportunity to provide comments regarding the City of Austin's Invasive Species Plan. The Texas Nursery & Landscape Association supports the growing, selling and planting of both native and non-native plants. We feel that the consumer should be able to have the option of what kind of landscape they prefer. However, there are some invasive plants in the current market and our industry plans to make recommendations to phase some of them out.

It is our understanding that this plan is for the City of Austin managed property only and not the consumer or retail nursery garden centers. We disagree with some of the plants that are listed as invasive within this document, but if this proposal is for city employee use only, TNLA is not opposing this plan. There are a few things you may want to change or clarify.

We recommend that the City of Austin look at the hybrids and cultivars of the plant species that are deemed invasive in this plan. For example, the Elephant Ears can be invasive in certain circumstances, but there are cultivars being grown of this plant that do not spread. To say that all Elephant Ears are invasive is false. That holds true for nandina and ligustrum as well.

Chapter 4.1, Prevention, page 19: TNLA is not supportive of just using native plants or non-invasive ornamentals to replace aggressive non-natives. There are many non-native plants that are in the marketplace, and they can serve the purpose just as well. Please do not take this as us saying we do not want native plants used. We are very supportive of our native plant growers and native plant garden centers. We just feel there should be a balance.

Thank you again for the opportunity. Feel free to contact me with questions or comments.

Jim Reaves
Director, Legislative & Regulatory Affairs
Texas Nursery & Landscape Association



7730 South IH-35 • Austin, Texas 78745-6698

(512) 280-5182 • FAX (512) 280-3012 • e-mail info@tnlaonline.org • www.tnlaonline.org

O'Toole, Matthew D

From: Simmons, Mark T
Sent: Thursday, September 29, 2011 11:59 AM
To: O'Toole, Matthew D
Cc: Waitt, Damon E; Bertelsen, Michelle M
Subject: RE: Notice for Comments: City of Austin, Invasive Species Management Plan
Attachments: image001.jpg; image002.jpg; image003.jpg

A couple of comments from me.

Correction Page 5 1.2.3.

Johnsongrass doesn't take nitrogen from the air N-fixing bacteria does.

delete

One example is Johnsongrass (*Sorghum halepense*), which is capable of growing in nutrient poor soils (i.e. native prairie soils)

through its ability to fix nitrogen, taking nitrogen from the air and, through interaction with soil biota, incorporating the nitrogen into the soil in a form plants can use.

Replace

One example is Johnsongrass (*Sorghum halepense*), which is capable of growing in nutrient poor soils (i.e. native prairie soils)

interacts with N-fixing bacteria which alters soil chemistry elevating nitrogen and other soil nutrients.

Delete

Thus, the ability of Johnsongrass to fix nitrogen, changing soil biogeochemistry, enhances its ability to invade and create near monocultures in soils that once supported diverse plant communities (Rout 2008).

Replace

Thus, the ability of Johnsongrass to alter soil biogeochemistry, enhances its ability to invade and create near monocultures in soils that once supported diverse plant communities (Rout 2008).

CORRECTION Table 4.5.2.

Table 4.5.2 – caption should include definitions of columns – especially as it is highly likely this table will be used independently

ADDITIONS

I would include some guidelines on construction/disturbed site hygiene – i.e. bare disturbed areas /stock piles etc should be kept free of invasive species DURING construction. These are often neglected and become MAIN SOURCE invasive seed for the whole site.

Also include a sentence or two on the need for physical removal (and herbicide if needed) of plants if they reach the flowering stage. Herbicide is not enough.

Mark Simmons PhD

Director

ECOSYSTEM DESIGN GROUP

Lady Bird Johnson Wildflower Center

University of Texas at Austin

4801 Lacrosse Avenue

Austin, Texas. 78739

O'Toole, Matthew D

From: Kathy Trizna <ktrizna@sbcglobal.net>
Sent: Monday, September 26, 2011 1:10 PM
To: O'Toole, Matthew D
Subject: Short Comment on City of Austin Invasive Species Management Plan

Dear Matthew O'Toole,

I want to make sure that you know that you may need to consider House Bill 338 which was passed this session and became effective 9/1/2011. This new law may require you to include a disclaimer with any list of invasive terrestrial plants you publish. I was one of a very few people who gave public testimony against this bill. We managed to delay it a little but we had no power compared to the lobbying efforts of the Texas Nursery and Landscape Association who proposed the bill. I have copied the bill (it is short) below for your information. Damon Waitt is familiar with this.

Regards,

Kathy Trizna

House Bill 338
Effective: 9-1-11

House Author: Aycock
Senate Sponsor: Seliger

House Bill 338 amends the Agriculture Code to require a public entity, other than the Department of Agriculture (TDA), that produces a list of noxious or invasive terrestrial plant species that includes a species growing in Texas for public distribution to commercial or residential landscapers to provide with the list a disclaimer stating that the list is only a recommendation and has no legal effect in the State of Texas and that it is lawful to sell, distribute, import, or possess a plant on the list unless the TDA labels the plant as noxious or invasive on the department's plant list. The bill provides requirements relating to the posting of the disclaimer in printed material made for public distribution to commercial or residential landscapers and requires the TDA to adopt rules requiring a public entity to include the disclaimer in an equivalent manner for publication of the entity's list through other media.



City of Austin Invasive Species Management Plan

Appendix E



Stakeholder response to frequently asked questions

Stakeholders reviewed all public comment. Public comment was categorized to allow for meaningful discussion.

Why is this plan not attempting to influence entities outside of the city (asking local businesses not to sell invasives, influencing TXDOT, requiring landowners to manage invasive species etc.).

Stakeholder response

- Such action is outside the scope of this plan
- Education and outreach are the primary vehicles through which outside groups will be influenced
- Plan will list primary stakeholder that will be targeted. And a statement indicating that we are hopeful this plan, through education and outreach, will influence outside groups such as state entities, homeowners and business owners, especially those that operate within the City of Austin will be incorporated.
- Voluntary and cooperative initiatives may be developed in the future, using this plan as a starting point, but laying out the parameters of those initiatives is premature and beyond the scope of this planning document.
- Program coordinator will investigate these opportunities, but the focus will remain on education.
- State law prohibits municipalities from restricting the planting, sale or distribution of noxious or invasive plant species. See below:

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SUBCHAPTER D. NOXIOUS AND INVASIVE PLANTS
Sec. 71.153. LOCAL REGULATION

- (a) A political subdivision may not adopt an ordinance or rule that restricts the planting, sale, or distribution of noxious or invasive plant species.
- (b) This section does not limit the preparation and distribution of educational materials relating to plants of local concern.

Added by Acts 2005, 79th Leg., Ch. 618, Sec. 4, eff. September 1, 2005.

Why weren't more specific Best Management Practices for restoration developed?

Stakeholder response

- The importance of post treatment management is stated
- The plan places emphasis on prevention, minimization of treatment impacts to the greater ecosystem and on managing land for invasion resistance. Together, this should reduce the need for intensive restoration.
- Restoration is site specific. It is not feasible to develop strategies for every landscape and situation that will be encountered by managers within the City. Restoration plans must be developed for each project driven by site specific conditions and goals.
- Invasive management is one piece of land management. A larger sustainable land management plan is being developed for the City, and this invasive management plan will fit into that larger plan.

Should we discuss invasive management in terms of fire management

- Pros:
 - Money & momentum
 - Invasive management does support fire management in some cases
- Cons
 - Fire management is a separate and complex issue
 - Both invasive and non-invasive species influence fire risk and fire behavior
 - A fire management plan for the City is in development
- Decision: No, this plan will not include a detailed discussion of invasive management in terms of fire mitigation. This plan will fit into the fire management plan being developed for the City.

Aren't some invasive species useful? Should useful invasives be treated differently?

Stakeholder response

- Usefulness and value to community of individuals is taken into account in the prioritization process.
- In terms of ecological value, a diverse native plant community will support more wildlife species than a non-native monoculture and will frequently be more functional ecologically.
- The difference between exotics and invasives will be clarified in the plan

Sustainable funding. Have we fully explored our options?

Stakeholder response

- This issue has been explored. It will continue to be explored as the plan is implemented.
- See funding section

Should the City be supporting/performing research in biocontrol? Does that discussion belong here?

Stakeholder response

- That discussion is beyond the scope of this planning document. It is a topic that may be considered over time, but cannot be fully explored here.

How was the value of volunteer hours established? Are volunteer organizations compensated based on that estimate? Are the values for volunteer time in this report a direct cost to the city?

Stakeholder response

- The source of the hourly estimate for volunteer time is cited in the report and this value is considered a national standard.
- Volunteer contributions are not a direct cost to the City
- Volunteer organizations are not compensated for volunteer labor
- Total cost table will be clarified, separating direct cost to city from volunteer contribution. Footnote will state that volunteer contribution is an in kind contribution—that is it is a donation of time, not money. Monetary value is assigned to facilitate comparison between direct costs and volunteer contributions. i.e. how much would it have cost the city to perform the work that was contributed by a volunteer.
- See Austin Parks Foundation response below. Originally posted:
<http://austinparks.wordpress.com/2011/11/04/whats-the-value-of-a-parks-volunteer/>

Austin Parks Foundation response to “What’s the value of a volunteer?”

“Recently, we’ve been participating in public meetings and city commission presentations about the draft City of Austin Invasive Species Plan. A number of questions have been asked specifically around the species chosen, who can use herbicides (only a certified applicator under direct supervision of city staff) and what is a volunteer worth in terms of time donated to the city.

We want to tackle that last question.

Stakeholder response to public comment

The Austin Parks Foundation organizes about 25-30 workdays a year and helps our 94 community groups who have adopted parks organize over a 100 more. We provide tool lending, technical assistance, getting in touch with city staff for a specific request, try to arrange donations of mulch, get a water connection turned on and so forth.

Our volunteers do amazing work and while we have a lot of big volunteer events like It's My Park Day (coming March 3, 2012!), a lot of them are smaller and on weekdays, working with 15-40 people from a company like Dell, AMD, CA Technologies, Pearson, Whole Foods, BMC Software and many others. These companies give their employees time off to spend a few hours with a foundation staff person to remove invasives, gather rocks, plant trees, spread mulch or some other task.

We then report the number of volunteers and the number of hours that they worked back to the City of Austin Parks & Recreation Dept, who track the overall numbers for the year. Generally, if the city wants to put a dollar amount on that volunteer labor donated, it's \$10.65 per hour.

The Austin Parks Foundation also provided grants for park projects to any group who has adopted a park. These grants come from a percentage of ticket sales from the annual Austin City Limits Music Festival each year. By contract, we spent those funds on park improvement projects on City of Austin parkland, subject to a grant approval process and approval from the City Parks and Recreation Department.

Any group that has adopted a park can apply for a grant anywhere from \$500 to \$50,000. We generally fund about \$300,000 in grants and projects every year. Further, the grantees must match our funding with a combination of cash, in-kind contributions, including materials, professional services (like a backhoe operator or structural engineer who approves a kiosk) and volunteer labor.

Volunteer labor donated as part of a grant project is valued at – you guessed it – \$10.65 per hour per the city guidelines.

We've felt this is far too low and wanted to see it raised. With the Draft invasive species management plan, we've proposed raising the value of a volunteer hour to \$21.36, the national average as determined by a national non-profit foundation called Independent Sector. This is simply to put a dollar amount on the total number of hours that volunteers already contribute by working on city parklands removing invasive species.

A few people have asked whether we, as a non-profit, are paid by the city to organize and manage volunteer events. The answer is no, we raise funds from our members, sponsors and grants to pay for staff time to organize and run volunteer workdays and in fact our entire operation of 2 full time and 2 part time staff. Another question is do we get paid that \$10.65 or \$21.36 per hour for each volunteer by the city for running these workdays. Again, the answer is no, we do not. The city does not have such funds and if they did, they'd hire employees or contractors to do the work, something that they desperately need. We work to bring volunteers out to help the city parks staff do the work that needs to be done and as a non-profit, it's one of services we offer for free and fund through donations from members, sponsors and from grants.

So, what is the value of a parks volunteer to us? They are invaluable, really. It's not about the numbers of people, the hours put in or a number per hour that they volunteer for. Our goal is offer opportunities that allow people to make a difference, get to know their fellow volunteers and have a positive experience so they'll want to come back and volunteer again with us or other park group.

Our thanks to all of the thousands of volunteers who have helped us in parks throughout this warm and dry year. We really appreciate your help. You are the Austin Parks Foundation.”

Why are we using herbicide in some situations? Why are we recommending Integrated Pest Management?

- See section 1.4

How are treatment methods and specific pesticides, if necessary, decided on?

- Initial protocols for the Top 24 invasive species were developed by the working group following a literature review of best practices. Effectiveness, potential impacts and practicality of treatment methodologies were considered. These protocols were further reviewed by a subcommittee of the working group. Review and revision of treatment methodologies will be ongoing and will follow an Integrated Pest Management approach, in which the most effective, economical and least toxic methods and materials are selected.

Should volunteers be allowed to use herbicide/chainsaws, etc.? Under what conditions?

Stakeholder response

- Only under limited circumstances and with appropriate training, licensing, supervision and demonstration of responsible behavior.
- Plan will make clear in regards to herbicide that no one can apply herbicide without meeting Texas Department of Agriculture (TDA) requirements for herbicide application on public land. Current TDA requirements for staff, paid contractors and volunteers, including licensing and record keeping requirements, will be stated in the plan.
- TDA requirements are the minimum standard. Departments may have more stringent policies.

O'Toole, Matthew D

From: Barrera, Rene <Rene.Barrera@austintexas.gov>
Sent: Monday, November 07, 2011 11:41 AM
To: O'Toole, Matthew D
Cc: Hanson, Angela
Subject: RB IMP comments and corrections
Attachments: Austin Parks Poster.pdf

Hi Matt:

I attend the public hearing last Thursday and commented that it is paramount to have ecological restoration placed in equal weight once an invasive project is initiated. Habitat degradation and disturbance regimes varies by site and species and once invasive spp. have been culled it is important to put native plant material back to minimize soil loss, reinvasion of invasives, loss of diversity, ecosystem resilience. I understand that the council initiative may not specify this and I urge that it be placed in the summary or in the restoration section. One cannot address one side of the coin without this critical BMP. R' sorry if my comments are redundant and I understand if they are not used.

1.2.1 Case Study, Mayfield Nature Preserve Corrections/ Comments

This case study highlights an inventory of current invasive woody vegetation, volunteer contributions, and future control costs of the Mayfield Park Preserve. The study's intent was to help land managers and volunteers make informed management decisions pertaining to the natural area.

In 1996 Japanese Privet, Japanese/Glossy Privet (*Ligustrum japonicum*, *Ligustrum lucidum*) Japanese Ligustrum, species composition was approximately 27 %. Staff removed fifteen acres of invasive species primarily along Taylor branch. Recolonization occurred when the invasive seed bank was not actively managed afterwards and a final full assault was executed by Parks staff and volunteers in 2008. As a result, 99% of Japanese Privet was eradicated. Smaller seedlings are now being managed by a trained Invasive Steward group.

Species managed since 2008 were Chinese and Japanese Privet, Chinese Pistache, Nandina Chinaberry, Taiwanese Photinia, Chinese Tallow, Cat's Claw Vine, English Ivy, Asian Holly Fern, Japanese Honeysuckle, Johnson grass, KR Bluestem, Ruellia, Elephant ears, Tree of Heaven, Vinca, and Vitex.

The overall distribution of woody plants documented in 2010 at Mayfield was 77% native species and 19% invasive. Notable invasive plants mentioned in the study are heavenly bamboo (*Nandina domestica*) and Chinese pistache (*Pistacia chinensis*).

Since 2008, over 3800 volunteer hours and \$25,000 have gone towards the elimination of predominate Japanese Privet, and heavenly bamboo Nandina and other invasive species. Total expenditures which include contractual labor and volunteer hours have eclipsed \$65,500.00. It is important to have appropriate staff to acre ration in order to monitor and stay ahead of invasive seedbank .

4.4 Restoration and Rehabilitation (Address soil disturbance. Revegetate with appropriate species)

Invasive species are capable of causing extensive degeneration or loss of inherent functional values or ecosystem services. In some cases, communities can recover once invasive species are removed as long as follow-up management and monitoring prevents re-invasion. However, in cases of severe degradation, natural recovery processes can be overwhelmed by invasive species and active restoration is required. When non native species are culled from a specific site is important to begin with a thorough understanding of preexisting conditions or model of the natural community. Evaluating the cumulative loss of baseline cover and diversity information is essential for a successful restoration

effort. This can be a simple process of comparing the project site to an adjacent undisturbed indigenous site or more elaborate with incorporating a list of native species into an elaborate recovery plan. One cannot look at a successful invasive project with out considering a thorough ecologic restoration plan.

In some cases, communities can recover once invasive species are removed as long as follow-up management and monitoring prevents re-invasion. However, in cases of severe degradation, natural recovery processes can be overwhelmed by invasive species and active restoration is required. Although restoration efforts have common elements, each area is unique. Work must be guided by site-specific considerations and analysis. Above all it should take an integrated ecological approach that focuses on ecosystem based management practices.

~~However, some generalizations can be made.~~ When soil is disturbed, and especially if it is left bare, it must be revegetated with appropriate species to prevent soil loss and reinvasion.

The goal of restoration is to restore ecosystem process, not simply to replace components. Ecosystem processes allow natural systems to repair themselves and to remain relatively stable. In practice, the assessment and repair of natural processes begins with the soil. In the process of treating and removing invasive species, the soil may be disturbed and left bare. In some cases, compaction reduction activities and organic soil amendments may be needed to restore soil to a useful state. Soil disturbance should be addressed and the area should be revegetated with appropriate native species as soon as possible. When immediate revegetation is not possible, temporary soil protection measures such as mulch may be needed. However, mulch suppresses all germination which can complicate later revegetation efforts. Generalized revegetation protocols can be found in the City of Austin Environmental Criteria Manual. Note: The Environmental Criteria manual does not go into great detail about ecological restoration and or land management practices and will need new sections added. Even the best restoration efforts may not return an ecosystem to its desired condition. It is far better to prevent or control invasive species and to prevent soils damage before restoration is required.

4.6 Standardization of Operating Procedures

Public perception

A common misperception to the untrained eye is that removing invasive woody species such as (examples) tallow, chinaberry or Japanese Privet cause loss of ground cover and subsequently erosion. Non-native colonization's displace native species, threaten habitat integrity and can profoundly alter native landscape. Left unchecked diverse habitats will ecologically transformed into vast monocultures. The truth of the matter is that the cumulative impacts caused by invasive species contribute to loss of soil and degeneration of resilient ecosystems. Removing invasive species merely expose overall impacts to the biota. Japanese privet (ligustrum) impacts to grass communities as document in 2003: <http://youtu.be/4oKELQ44O9M> The video shows loss of inland sea oats, *Chasmanthium latifolium*. Impacts are seen directly under the ligustrum's canopy drip line. Causes are loss of sunlight and nutrients.

Brush accumulation can be perceived as a fire hazard and eye sore to the general public. To reduce these concerns, accumulated cuttings should be disposed of appropriately. Various techniques such as wind-rows, chipping, and complete removal of woody slash have been adopted by city departments. Public perception should be taken into consideration on a site by site basis when deciding on the best management practice for brush control. In addition, it is important to notify neighborhoods that may be affected by the work. When work is being done in highly visible, high profile sites, letters should be sent explaining the work to be done, schedule, revegetation plan and contact information. Each Department should have access to a standardized yard-sign-sized sign that can be placed in high profile work areas to educate the public. These signs should have the logo of all plan development partners, a unified "brand" such as "Least Wanted" or "Hello...Goodbye" and a place for contact information (e.g. the city department, Austin Parks Foundation or Keep Austin Beautiful). Picture attached of "Least Wanted signage"

John Burns

From: webapp@ci.austin.tx.us
Sent: Friday, October 21, 2011 8:07 AM
To: Hanson, Angela
Subject: Survey Completion: Invasive Species Management Plan

Follow Up Flag: Follow up
Flag Status: Yellow

The survey, Invasive Species Management Plan, was just completed.
The survey was completed at 10/21/11 at 8:06 AM Owner Key:
2697687D-A9CA-995D-98FBF9E6B9779F3F

Q1) Name

A) John Burns

Q2) Affiliated organization or group (e.g. Neighborhood Association, non-profit group, etc)

A) University of Texas

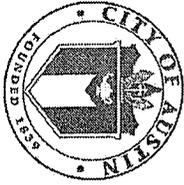
Q3) Comments

A) I agree with the overall concerns. The plan appears to be a very well thought out plan with a lot of very good information. I like the explanation of what makes or doesn't make a plant an invasive species.

This is an auto-generated message, please do not reply.

If you do not wish to receive more email results, please login to survey builder and remove your email address from the "send results" text box.

Thanks
-Admin



11/3/11

COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

Your information is subject to the Open Records Act.

Please Be Aware

Name (Please Print)

Phil Burns

Affiliation (Organization)

Citizen

Contact (Optional)

Phone: 350-8639

Email Address: philburns-17@hotmail.com

Please indicate your position on this item:

FOR

AGAINST

NEUTRAL/UNDECIDED

Signature:

Comments:

No Public Funds to private individuals, ie. contractors w/o super vision.
Problem w/ compensation
w/ funds of city

October 3, 2011

To: Matthew D. O'Toole
Environmental Designer
Lady Bird Johnson Wildflower Center
4801 La Crosse Avenue
Austin, Texas 78739

From: Phil Burns
3504 Clearview Dr.
Austin, Texas 78703

Re: City of Austin, Texas Invasive Species Management Plan

Mr. O'Toole,

I have reviewed the City of Austin, Texas Invasive Species Management Plan and believe that the information within is deeply flawed concerning;

1. Pesticide / herbicide use,
2. Compensation amounts for volunteers and contractors - both past and for the future,
3. Promulgation of a plan that is for farm or agricultural use - not a city,
4. Lack of the Invasive Species Management Plan citizen comment period being broadcast to the citizens of Austin.

For these reasons, I respectfully request that the citizen comment period be extended an additional month.

I further wish to state that information contained within the plan I believe has been fraudulently supplied with intent to mislead your committee. I intend to report this fact to the City of Austin Manager. I will additionally ask the city manager that the Austin Parks Foundation and the City of Austin Parks Department be excluded from your committee and any further meetings concerning an invasive species management plan.

Please forward this to all interested parties and city departments. I will send a certified copy of this to you at the above address.

Yours,

Phil Burns



CITIZEN INPUT ON CITY OF AUSTIN, TEXAS INVASIVE SPECIES MANAGEMENT PLAN, addendum

I. Existing Plans that should be Utilized or taken into account in the decision making process other EPA's Plan. p. 7

The EPA Plan is basically a pesticide use plan for a farm. Austin is not a farm.

- Handwritten: Austin*
1. City of Portland's Invasive Species Management Plan. This is the best source. 158 page plan; <http://www.portlandonline.com/bes/index.cfm?c=50360&a=266506>
 2. City of Palo Alto's Pest Management Plan - primarily for insects 60 page plan; <http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=2476>
 3. San Francisco County's Pest Management Plan - for pesticide use 8 page plan; <http://www.sfenvironment.org/downloads/library/ipmordinance.pdf>

II. Valuation of volunteer time. p. 25.

The current estimate for valuation of volunteer time is for all spectrums of employment except farm laborers. From medical doctors to clerks, and is averaged. According to the Independent Sector, which is cited in the plan, there are disclaimers of there estimate values. All information provided on this topic below is available at Independent Sector's website;

<http://www.independentsector.org/>

How the numbers are calculated

Handwritten: Finance

The value of volunteer time is based on the average hourly earnings of all production and nonsupervisory workers on private nonfarm payrolls (as determined by the Bureau of Labor Statistics). Independent Sector takes this figure and increases it by 12 percent to estimate for fringe benefits.

Charitable organizations most frequently use the value of volunteer time for recognition events or communications to show the amount of community support an organization receives from its volunteers.

According to the Financial Accounting Standards Board (FASB), the value of volunteer services can also be used on financial statements — including statements for internal and external purposes, grant proposals, and annual reports — only if a volunteer is performing a specialized skill for a nonprofit. The general rule to follow when determining if contributed services meet the FASB criteria for financial forms is to determine whether the organization would have purchased the services if they had not been donated.

Accounting specialists may visit FASB's website for regulations on use of the value of volunteer time on financial forms: <http://www.fasb.org/pdf/fas116.pdf>.

It is very difficult to put a dollar value on volunteer time. Volunteers provide many intangibles that can not be easily quantified. For example, volunteers demonstrate the amount of support an organization has within a community, provide work for short periods of time, and provide support on a wide range of projects.

The value of volunteer time presented here is the average wage of non-management, non-agricultural workers. This is only a tool and only one way to show the immense value volunteers provide to an organization. The Bureau of Labor Statistics does have hourly wages by occupation (<http://www.bls.gov/ncs/ocs/sp/ncbl1554.txt>) that can be used to determine the value of a specialized skill. It is important to remember that when a doctor, lawyer, craftsman, or anyone with a specialized skill volunteers, the value of his or her work is based on his or her volunteer work, not his or her earning power. In other words, volunteers must be performing their special skill as volunteer work. If a doctor is painting a fence or a lawyer is sorting groceries, he or she is not performing his or her specialized skill for the nonprofit, and their volunteer hour value would not be higher. http://independentsector.org/volunteer_time

Estimation of labor costs in Austin as of May, 2010. True labor cost \$9.25 versus \$21.35 a 230% difference.

percentile of workers	10%	/25%	/50%	/75%	/90%
Laborers and material movers, hand...	\$7.25	/\$7.50	/\$9.25	/\$11.07	/\$13.04

The 50% or mean valuation is \$9.25.

Bureau of Labor Statistics 2010 report for the Austin area dated May, 2010
<http://www.bls.gov/ncs/ocs/sp/ncbl1554.txt>

USDA's valuation of farm labor hourly wages dated August, 18 2011 is \$10.90 but is based on national statistics. This is a 195% difference from the \$21.35 amount.
<http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1063>

Measurement at Fair Value

19. Quoted market prices, if available, are the best evidence of the fair value of monetary and nonmonetary assets, including services. If quoted market prices are not available, fair value may be estimated based on quoted market prices for similar assets, independent appraisals, or valuation techniques, such as the present value of estimated future cash flows. Contributions of services that create or enhance nonfinancial assets may be measured by referring to either the fair value of the services received or the fair value of the asset or of the asset enhancement resulting from the services. A major uncertainty about the existence of value may indicate that an item received or given should not be recognized.

FASB: Financial Accounting Standards Board Financial Accounting Foundation.
<http://www.fasb.org/pdf/fas116.pdf>.

Integrated Pest Management (IPM) Principles

What is IPM?

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

The IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides. In contrast, *organic* food production applies many of the same concepts as IPM but limits the use of pesticides to those that are produced from natural sources, as opposed to synthetic chemicals.

How do IPM programs work?

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In practicing IPM, growers who are aware of the potential for pest infestation follow a four-tiered approach. The four steps include:

- **Set Action Thresholds**
Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic threat is critical to guide future pest control decisions.
- **Monitor and Identify Pests**
Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.
- **Prevention**
As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstock. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.

- **Control**

Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less *risky* pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

Do most growers use IPM?

With these steps, IPM is best described as a continuum. Many, if not most, agricultural growers identify their pests before spraying. A smaller subset of growers use less risky pesticides such as pheromones. All of these growers are on the IPM continuum. The goal is to move growers further along the continuum to using all appropriate IPM techniques.

How do you know if the food you buy is grown using IPM?

In most cases, food grown using IPM practices is not identified in the marketplace like *organic* food. There is no national certification for growers using IPM, as the United States Department of Agriculture has developed for organic foods. Since IPM is a complex pest control process, not merely a series of practices, it is impossible to use one IPM definition for all foods and all areas of the country. Many individual commodity growers, for such crop as potatoes and strawberries, are working to define what IPM means for their crop and region, and IPM-labeled foods are available in limited areas. With definitions, growers could begin to market more of their products as *IPM-Grown*, giving consumers another choice in their food purchases.

If I grow my own fruits and vegetables, can I practice IPM in my garden?

Yes, the same principles used by large farms can be applied to your own garden by following the four-tiered approach outlined above. For more specific information on practicing IPM in your garden, you can contact your state Extension Services for the services of a Master Gardener.

Citizen Input on City of Austin, Texas Invasive Species Management Plan

Invasive species are a problem. A cohesive unified plan, database of locations and an official responsible for implementation would be a valuable resource for our community.

Overview of Problems with the Management Plan

1. Information presented in order to support a desired conclusion by:

A. Not presenting other parks as an example of what can go wrong. Redbud Isle entirely within 100 year flood plain yet no plan even though legally required.

- a. No hydrologic, ecologic, or other legally required reports under city code.
- b. No erosion control as required by city code.
- c. Lack of adequate revegetation efforts by contractors benefiting from grants.
- d. New problem with herbicide spraying that has killed established oak trees.

B. Presenting Mayfield Park as an example but not citing where the \$25,000 cost went.

- a. How much went to contractors?
- b. Three year old plan still in progress, not yet finished - a poor example.

C. The basic assumption for integrated Pest Management Principles, control and herbicide use is that our city is a farm. There are better management principles for use by cities or departments of a city like parks.

- a. Ecological reasons for not using herbicides in parts of the city.
- b. Spraying of herbicides by private citizens a acknowledged problem.

D. Lack of addressing current problems and issues within PARD. Yet PARD is used as best practice.

2. Using contractors / organizers to implement eradication:

A. Costs a great deal more than organizing volunteers directly through city managers.

- a. Use of \$21.36 amount versus the existing \$10.65 is based on unaccountable, uncited sources.
- b. \$816,263 amount by PARD alone for volunteers is unconscionable.
- c. The city will adopt the highest cost program without investigating why other programs are cheaper.
- d. Lack of adequate data being provided by the more expensive programs for decision making.

B. Creates a legal liability for contractors and volunteers if problem occurs.

C. Current management of contractors is lacking to a criminal degree.

i.e. Blunn Creek. PARD's memo on Herbicide Treatment at Blunn Creek was in response to complaints by area residents. And it is PARD's opinion and not of all the

concerned parties. PARD failed to monitor during the many weeks of spraying, even though this was a first of its kind activity. PARD should have monitored all phases before, during and after application, not just after there were complaints.

Analysis of Specifics

1.2.1 Last sentence. The Murray cite is from 2001 yet the Mayfield Park program didn't start until 2008.

1.2.3 Last paragraph (conclusion paragraph) Lack of citation concerning avian fauna being influenced by invasive species.

1.4 Entire conclusion. This cite is for agricultural use. Our city is not a farm. Is there not a better guidance to cite. It overly simplifies. Some city property should be entirely exempt from herbicide use for ecological reasons. In our area that is prone to drought certain time of the year should be exempt. Also certain times of the year are better for other flora and fauna when they may be dormant or absent.

1.4 Last paragraph. Currently PARD doesn't monitor during or after pesticide use. PARD's Blunn Creek memo was in response to complaints by area residents. There was no monitoring during the many weeks of spraying even though this was a first of its kind activity.

1.7 Flawed inclusiveness. Few mainstream outside organizations are included. i.e.; Sierra Club, Save Barton Creek, Audubon Society. Austin Parks Foundation is a group that will profit off of access to city funds if this management plan passes.

2.1 Paragraph 3. The definition of volunteer is someone who works for free. There seems to be confusion between contractor and volunteer. Contractors may hire employees, but for the majority of the work envisioned it seems that contractors will utilize volunteers and charge the city or grant provider for volunteers work.

2.2 Paragraph 3. "Most treatment activities are accomplished through staff lead grants utilized by outside contractors and through volunteer assistance." This is ripe for abuse because there is no tracking of funds by the city. As an example, how much of the \$25,000 spent on invasive eradication in Mayfield Park was given to contractors versus how much of the work was done by volunteers. Who keeps track of this - the contractor - not the grant provider.

2.2 Paragraph 3. PARD currently doesn't have plans for parks with flood plains which is a legal requirement under the City Code of Austin. Also, no erosion control or permitting which are legal requirements under the city code are being performed.

3.1 Paragraph 2. Austin Park Foundation sponsors groups to come in to parks and begin work with NO park meetings or community involvement. This effectively privatizes a park. If you complain to the park manager you get no response. If you go to a parks board meeting and complain about rampant illegal cutting being done, the director of PARD does not send the police to deal with the problem. Individual contractors and Austin Parks Foundation have direct contact with the director of PARD and use this contact inappropriately by targeting individuals who disagree with their lack of planning and lack of inclusiveness.

4.1 Paragraph 3, point 7. "Managers should monitor areas after work has been done..." This should be changed to "Managers should monitor at all phases of work..."

4.2 Last paragraph, 3. Rapid Response. An example of federal agency utilizing other

governmental agencies is not supportive of governmental and private citizen partnership.

4.3 Paragraph 3, Sentence 1. Why should managers utilize contractors? There is a inference that contractors should be used. A citation or specific instance should be used. Contractors cost money. Shouldn't there be a limitation on use of contractors unless specialized knowledge or equipment is needed. Why can't city managers use volunteers without the middleman?

4.3 Paragraph 3, Sentence 3. Which specific City, State and Federal laws apply. Please cite.

4.4 Paragraph 1, Sentence 4. Cite specific considerations to apply. Surely this information can be obtained and an analysis or decision tree can be drawn up. Generalized protocol will lead to accidents or problems. There are many sources of information on this.

4.4 Last Paragraph. This assumption needs to be cited and quantified within a decision tree. Right now this is an omission that should be addressed BEFORE eradication efforts continue. What is the proper ending. Surely not Mayfield Park. The Park is a work in progress. Surely not Redbud Isle, it is similarly a 3 year ongoing process where minimal replanting has occurred and no erosion control efforts have been utilized in response to cutting of vegetation.

4.5 Paragraph 4, Sentence 1. What about cost, legal constraints such as flood plain restrictions or Barton Creek restrictions.

4.5 Paragraph 5, Last sentence. What about organizing volunteers by an invasive species coordinator.

4.5 Paragraph 6. Incomplete paragraph. Where is the rest?

4.6 Paragraph 3, Sentence 5. Citation of who is on this independent sector, non-partisan coalition of charities. My bet is this uncited list includes many interested parties that would benefit from an abnormally high estimate of costs.

4.6 Paragraph 3, Sentence 6. A volunteer by definition is free. If a contractor wants to charge for a volunteer's time the volunteer should be explicitly notified before work begins. This includes fringe benefits being calculated into the free of charge calculation.

4.6 Paragraph 4, Last Sentence. What about one crew of specialized pesticide applicators. This would increase training and effectiveness. Also if several crews were utilized for a project and a mistake occurs when each crew had its own pesticide applicator they may blame each other for the problem. One crew responsible for pesticide issues is safer, more efficient and when a problem occurs (and it will) is easier to pinpoint the problem and address retraining.

4.6 Paragraph 5, Herbicide/Pesticide Use. The head grounds keeper at AISD Russ McElrath does not advocate use of herbicides because "the learning curve is too steep" and mistakes will happen. Right now Austin's PARD in their memo dated Sep. 2, 2011. In the Departmental Policy Recommendation that "At this time, it is recommended that no further independent volunteer work shall be preformed by Mr. Daniel White or other volunteer on city of Austin park land." Yet this is not happening, there was work on Redbud Isle Oct 28th and 29th. There seems to be an inconsistency within the department. PARD wants the invasive control officer to be within its departmental structure. I would argue against this because of: 1. Outside coercive manipulation, 2. Inability to manage existing programs, 3. Inability to maintain consistency on established protocol, 4. An

established lack of management on monetary supervision, 5. Lack of responsiveness to park patrons phone calls, 6. Lack of management concerning illegal activity performed in parks, 7. Lack of management by placing park volunteers in legal jeopardy if problems occur, 8 Lack of management by not keeping records. All of this is why your group was formed. To make city policy consistent. This can be a learning moment or poor policy can continue.

4.6 Paragraph 6, Volunteers. Volunteers should not be allowed to use herbicide, nor should they be allowed to use chain saws. The liability is too high. Will the city self insure or contract out for liability insurance? There should be cost estimation prior to work beginning and it should be posted for citizen review. This currently does not happen.

4.6 Paragraph 7, Public Perception. Public comment and meetings should be allowed. Currently this is not the case. This meeting is a great example, what kind of notices were given? Public perception will be improved if the following issues are addressed: 1. Transparency; through proper notification of the public, proper record keeping by the city, disciplinary action against rule breakers, disclosure of funds being spent, disclosure of site plans, proper permitting. 2. Best Practices; through proper time of year eradication efforts, plans and timelines for projects being followed, initiation of process by the city through private individuals NOT contractors, volunteers being free, proper management as stated above in comments on 4.6 Paragraph 5.

6.1 Costs. You do not address legal liability of using outside organizations.

6.1.1 Staffing Costs. Paragraph 2, Sentence 3. Future salary requirements should not be decided by a Coordinator, although they should have input. This has the potentiality for problems if one individual is to be in charge of compensation amounts. Managers and staffers should be allowed to organize unpaid volunteers to perform eradication efforts.

6.1.1 Staffing Costs, Final Paragraph. Why if PARD is currently breaking its own rules, the city code and doesn't keep records should they be allowed to have control of this position? Also if PARD and Watershed Protection have the highest compensation amounts compared to other departments the discrepancy in amounts should be further investigated. This is especially true in light of Austin Watershed Protection - Waterways incomplete data (p. 34 bottom of page).

6.1.2 City Costs. Totally flawed analysis in that volunteers are free. What departments currently use free volunteer labor?

6.1.2 Austin Parks and Recreation. Paragraph 4, Last Sentence. \$816,263 for volunteer labor. Again volunteer is defined as free.

6.1.2 why is there a disparity in costs of \$7.70 to \$11.80 per acre under Austin Water Utility and up to \$1,930 per acre under PARD? Also why is the \$21.35 amount per hour used under PARD when the current amount is \$10.65? This number also is being used by Watershed Protection but without complete data.

This is a rushed analysis of the issues as I only found out on Oct 28th, 2011. There will be more issue discovered as analysis of this plan continues.

Thank you, Phil Burns

Please feel free to contact me at:

philburns_17@hotmail.com or 512-350-8639



MEMORANDUM

TO: Sara Hensley, CPRP
Director of Parks and Recreation

FROM: Kelly Snook, ASLA
Assistant Director - PARD
Troy Houtman - Division Manager PARD,
John Gleason, RLA – IPM Coordinator, WPD

DATE: September 2, 2011

SUBJECT: Herbicide Treatment at Blunn Creek

This memo is to provide an update to the vegetation management conducted in the Blunn Creek area from 6/18/2011 through 7/18/2011 by Daniel White, a volunteer for the City of Austin. It is also intended to address some of the concerns brought forward by representatives of the South River City Citizens (SRCC) neighborhood group in response to the vegetation management. The goal of the management work conducted by Mr. White was to eradicate poison ivy and several non-native invasive species (including Waxleaf Ligustrum, Chinaberry, Chinese Tallow, and Nandina). Several months prior to the work city staff met Mr. White onsite to discuss the vegetation management goals and protocol. It was decided that the proper and safe use of herbicides would be allowed as a way to cost effectively achieve the objectives of the project. Staff requested that Mr. White submit a detailed treatment plan including specific integrated pest management (IPM) information. A plan was submitted by Mr. White and accepted by WPD and PARD. The herbicides that were used include the products Garlon 4, Garlon 3a and Remedy.

As a follow up to the management efforts, several City of Austin employees performed an onsite evaluation of the work conducted by Mr. White. On 8/4/2011, John Gleason-Watershed Protection Department, Troy Houtman-Grounds Maintenance Division Manager, PARD, Pat Fuller-Park Ranger Division Manager, Michael Sledd, Park Ranger and Philip Gerdes-Forestry Program, met onsite to observe the results. The comments below are a compilation of our onsite observations and thoughts regarding neighborhood concerns.

- Signage: Mr. White was instructed to post signs onsite before and during the herbicidal treatment and to remove the signs once the herbicide was dry. During the treatment period the signs were not observed and it is apparent that Mr. White did not comply.
- Environmental Impact Concerns: Due to the current drought there are very few locations in the creek where surface water is present. Thus it is anticipated that the opportunity for contamination of the stream due to herbicidal treatment is low. The selected herbicides have no restrictions regarding applications in public areas and are safe around people, pets and in the environment when used as directed.
- Pest Eradication: The results of the herbicide treatment were apparent throughout the site and it is evident that Mr. White was quite thorough in affecting the targeted species. From the standpoint of pest eradication it appears that his vegetation management efforts were successful.
- Non-Target Plants: Unfortunately staff found evidence of herbicidal overspray or drift on the site. Close and careful observation was required to sort out drought-stressed trees versus those affected by herbicide. Many trees had yellow leaves or lacked leaves completely due to drought. However, the foliage of herbicide-affected vegetation was typically brown, rather than yellow, and the branches were still thick with leaves. This type of damage indicated to us that non-targeted plants (including American Elm and Box Elder) were affected as a result of the herbicide treatment.
- Tree diameter: Mr. White was instructed not to treat anything tree more than 8 inches in diameter; however staff found several trees (Chinaberry) larger than 8 inches in diameter treated with herbicide.
- Professional Conduct: Neighborhood residents have expressed concern regarding their interactions with Mr. White while he was conducting the vegetation management work onsite. They apparently asked him about the work and felt that his responses were unprofessional and inflammatory. Staff has also had difficulty communicating with Mr. White due to his disrespectful and impolite demeanor.
- Erosion and Revegetation: An allowable amount of erosion is natural within a stream channel and WPD anticipates little additional erosion due to the loss of affected vegetation. The affected areas are expected to revegetate naturally and WPD will monitor them over time to verify that this occurs. Should natural recolonization not occur in a satisfactory manner, WPD will take a more active role to ensure that undue erosion does not happen.
- Tree Removal: PARD Forestry staff has conducted a thorough evaluation of the site in regards to tree removal. Documentation of their evaluation has been provided in a separate report.
- Addition of Fertilizer: Mr. White added fertilizer to several trees without direction, permission or notification. This work was not in the scope of work and staff was notified of the work by a citizen in the neighborhood.
- Driving on parkland: It was reported that Mr. White on several occasions drove on parkland after being warned not to drive onto the park.

- Mixing herbicide: It was reported that Mr. White was mixing the herbicide chemicals near the park drinking fountain which raised concerns of contamination of the drinking water.
- Following directions: Mr. White was given specific instruction to stop all work at the park on July 28th, 2011; however he continued to work at the site on the weekend of August 13th, 2011. This demonstrates that he lacks the ability to follow instructions and has a disregard for staff.

PARD action items:

1. Staff will work on a more collaborative process to either notify the neighborhood of work being conducted or more involvement with the neighborhood in the maintenance and operations of our parks, greenbelts and creeks.
2. All herbicide work at Blunn creek will stop and if future herbicide work is considered, staff will work with SRCC.
3. An effort to revegetate will be considered and planned in the future. However, current drought conditions will hinder and delay the process. This work will be led by Watershed.
4. To follow up on the tree evaluation performed by Forestry staff, Watershed and PARD will begin to remove any hazardous trees that are an extreme threat to the safety of those using the park.

Departmental Policy Recommendation:

At this time, it is recommended that no further independent volunteer work shall be performed by Mr. Daniel White or other volunteer on City of Austin park land. Specifically, Mr. White shall not be allowed to continue to spray chemicals, apply fertilizer, remove plant species, or otherwise perform any maintenance tasks independently on any City of Austin parkland due to two major areas of concern. First, Mr. White has exhibited aggression toward staff and citizens, and has caused great concern in the community through his behavior. Secondly, he has not adhered to the terms of the volunteer agreement including a propensity to over spray and misidentify plants and trees.

The Parks and Recreation Department will develop a Volunteer Policy specifically addressing the use of potentially harmful products, materials and equipment by volunteers on parkland. This policy will address items including but not limited to use of any and all hazardous materials including chemicals, pesticides, herbicides, as well as power equipment such as chainsaws, and heavy equipment such as backhoes etc. The policy will include requirements for insurance, bonding and licensing as well as proper notification of surrounding areas, identification of volunteers while engaged in such activities, and level of supervision required. This policy shall be vetted through the department and may ultimately result in a departmental decision to NOT allow certain types of activities to be performed by volunteers, but PARD staff or contracted companies only.

Lastly, staff shall continue to communicate with the SRCC and other neighborhood residents regarding their concerns in this specific incident, as well as other significant maintenance or construction projects. It should be noted that the department acknowledges that this project was attempted to further the efforts of our maintenance divisions in time of budget shortfall. However, this project did not provide the anticipated outcomes and staff will continue to address this situation and prevent further situations of this type from happening in the future.

Please do not hesitate to contact me should you need additional information regarding this vegetation management work.

*Please note this memo was submitted to Sara Hensley on August 30, 2011 and the recommendations were accepted at that time.

Red Bud Isle

From: **Poop Patrol** (redbudpoopatrol@hotmail.com)

Sent: Tue 10/25/11 7:05 PM

To: philburns_17@hotmail.com

Phil,

I was out at Red Bud Isle a month or so ago and was discussing recent work being done at the park by volunteers, PARD and AmeriCorps.

One of the park patrons mentioned that you had some concerns as well. She gave me a copy of the document you assemble regarding the park and it's past issues. I looks like a lot of work went into the paper and I am interested in following up with you on some of the concerns mentioned as I too have concerns.

In no particular order here are my questions and comments:

1. Volunteer groups profiting

This is alarming! I frequently participate in events like "It's My Park Day" at RBI, so I would hate to think that someone was making a profit from my sweat. I would be very interested to see any documentation of this as

I asked the folks at PARD about this and they indicated that all work at Austin's parks is done by:

- PARD employees
- AmeriCorps or other similar groups funded through grants from the federal, state, local and/or APF
- Volunteer groups using funds they raise in various ways

I was told by Rosie Weaver at APF Friends of Red Bud Isle has a fiduciary account with Austin Parks Foundation which receives donations generated via their website, which FORBI links to from it's website. These funds are only released for projects that have PARD approval and with presentation of a receipt for the expenditure. She indicated that usually a volunteer pays for the project out of pocket and is latter reimbursed when the account has the funds.

2. Mulching in the floodplain

I agree that this is not the best solution for some of the reasons you mentioned, but it appears to be the best that can be done for now. I would like to see a master plan for the park that included the addition of soil, re-grading, grass and irrigation in this very rocky area.

I was told that this was done as part of "It's My Park Day" and was approved by PARD. The person even commented that PARD has the only keys to the gate and "Nothing could be delivered without our help!"

3. Invasive species removal

Not my favorite thing either. I like honeysuckle and some of the other "Most Wanted" invasives on PARD's list of undesirable residents in the park.

It is my understanding that the recent removal of invasives has been done by AmeriCorps, funded by grants. I know that there is a citywide initiative to remove invasives especially giant cane as was done at RBI recently. To my knowledge, no volunteer groups are involved in this and I have not noticed any invasive cutting recently.

I agree that a better job of mitigation needs to be done after the removals are done to avoid erosion and the "bald" appearance left behind.

I have never seen Kudzu in the park. The stuff that looks similar is Mustang Grape, which can overtop and kill trees. PARD did some limited cutting of the mustang grape during the trail maintenance a couple of months ago. Probably a good project to cut some of it to save as many trees as possible.

4. *Unapproved, Non-code compliant structures*

I think the wooden Boy Scout steps are silly, but you really can't see them unless you are looking for them. Not sure I have ever seen them used.

It's my understanding that everything that is done in the park is permitted by PARD. The steps project is documented on both the FORBI and APF websites and it looks like PARD, APF, FORBI and a professional architect were all involved in the planning, design and construction. I saw the "Before" pictures from the stair projects at the point on the APF website and I believe they were needed. The situation is safer now than it was before the project.

<http://austinparks.wordpress.com/category/red-bud/>

I'm not sure that the building standards you refer to apply to this type of project in a wilderness setting. I have seen a ton of trail projects throughout the greenbelts that are not nearly this well done.

There is a similar set of stairs at Auditorium Shores in the dog play area that is also used for triathlons

5. *Parking...what a mess*

I agree that the parking is terrible. A 15 acre park with 25 parking spots is terrible.

I was explained to me by PARD that the fire lanes are determined by the fire department itself and are integrated into the initial approved construction design. These standards are designed to allow fire trucks to enter the park without obstruction.

There were a lot of complaints to PARD after the three parking spots were removed earlier this month, but the FD took another look and gave two of them back, so there is a little good news.

There was a meeting at the park on Sept. 8th with PARD, where parking was discussed. I attended the meeting and have seen the meeting minutes posted in the kiosk at RBI. Hopefully progress is being made. How many total parking spots do you think is adequate? Maybe we can form a taskforce.

6. *Adopt-a-Park Program*

I have emailed PARD for additional information on the program. How long has it been since you asked

AUSTIN CITY LIMITS MUSIC FESTIVAL
GRANTS FUND APPLICATION

Budget for: _____

Your Contributions		
Your Labor Contribution		
Volunteer labor (Itemize by workday or type of task)	Hours (10.65 per hour)	Total Value at \$10.65/hr
March 10 th workday - spreading of mulch	20 volunteers for 4 hours each (80 total)	\$ 852
April 14 th workday - mulch	50 volunteers for 4 hours each (200 total)	\$2,130
May 20 th workday - invasives	10 volunteers for 4 hours each (40 total)	\$ 426
Friends of Red Bud Isle organization and website	2 volunteers at 10 hours each (20 total)	\$ 213
Total Volunteer Labor Value		\$3,621
Your In-Kind Contributions		
In-Kind contributions from entities other than PARD	Likely donor source (Who will you ask for this?)	Cash Value
Total In-Kind Contributions		\$
Your Cash Contributions		
(Including savings, funds from other grants, and funds yet to be raised)		
Likely Source (e.g. neighborhood assn, neighbors, bake sale)	Contribution	
Donation for materials (signs, bench pads, fence, kiosk) - fundraise	\$ 900	
Total Cash Contributions		\$ 900

Several years ago an arborist company had a contract to cut down trees adjacent to Barton Springs. The company was to be paid over \$1.5 million for the contract. When there was an outcry by citizens, the plan was found to have a severe lack of documentation as to why this was to occur, why the costs were so high and who came up with the idea. I believe that the city of Austin's Invasive Species Management Plan has the potential for the same or similar problems.

I. Will City of Austin funds be used to pay for work by persons that are not city employees?

Austin's new Invasive Species Management Plan envisions using city funds to eradicate invasive plants. "Managers should utilize employees, contractors and volunteers to implement Integrated Pest Management strategies."¹ The cost to Austin is estimated to be approximately \$10.9 million over a Five Year Goal.²

Appendix H stipulates the amount of costs to the city for vegetation treatment and removal.³ It does not state whether this amount is to be paid to a contractor or is for record keeping. It appears to be for payment to contractors. There is no stipulation for contractors using volunteers within the Plan or a definition of what a contractor does.

In the past American Youthworks has contracted and been paid directly for work on invasives, trails, and herbicide spraying in our parks by public and private grant funds. Will they be compensated by city of Austin funds?

II. What is a volunteer worth?

There is a cost breakdown of Department and organization offsets in table 6.1.2.1 on p31. Under this chart, volunteer contributions are estimated at \$888,368 in total direct costs (if an annual 25% area of the city is treated). What is the definition of total direct cost and should volunteer contributions factor into a chart with direct costs? Volunteer contributions should be primarily used for grant in-kind contribution not for direct costs.

The amount for matching funds for volunteer effort is calculated incorrectly.⁴ The current estimate for valuation of volunteer time is for all spectrums of employment except farm laborer. All levels of employment are used, from medical doctors to clerks, and is averaged. According to Independent Sector, which is cited in the Management Plan, there are disclaimers of the estimate values.⁵ It should be closer to \$ 9.50 per hour. This number is debatable but shouldn't be anything like \$21.35.

Why track volunteer time? Volunteer time can help you meet requirements for matching

¹ City of Austin's Invasive Species Management Plan. Section 4.3, p20.

² Ibid. Section 6.1.2, p30.

³ Ibid, Appendix H

⁴ Ibid, Section 4.6, p25.

⁵ www.independentsector.org/volunteer_time

funds.⁶ The amount of \$21.35 is used as an in-kind offset to transfer a cash value for work invoiced by contractors. Currently a fee-for-service contract is being utilized for work within city parks. American YouthWorks (AYW) provides a service and invoices a monetary amount that needs to be paid out of an original Austin Parks Foundation grant. This is a direct cost - not an offset. At the same time there may be other grants being used to reimburse the original grant writer for AYW work. You may have two or more grant systems paying for the same work provided by AYW. Are AYW workers being accounted for at the \$21.35 rate? According to AYW 2010 IRS statement there are stipends paid to AYW workers. How does this work? It seems that there are several different grant type funding through AYW. i.e. training through federal grants for OSHA (I assume herbicide treatment training), and many other state and federal grant programs.

III. Possible Grant funding Problems

The Management Plan states that the city should incorporate the contributions of volunteer and public sector organizations to increase the amount of matching funds from granting programs.⁷ Will the city Invasive Coordinator solely manage grants, or will there be a nebulous amalgamation of grants? The plan does list possible grant funding sources, but doesn't state who applies for which type of grant and how it is tracked. Austin Park Foundation does some of this, but after approval of the project by the city there is no tracking of what grants have been used. Also Austin Park Foundations last publicly available IRS statement that I could find was for a period ending Sep., 2009 and was received Aug., 16, 2010. Clearly their record keeping is not up to date.

Where does the money go? Apparently, the majority of the \$25,000 cash spent on Mayfield park went towards paying American YouthWorks. If this is true, and there were other matching grants, there should be an additional amount provided by the other grant system(s). Has this been accounted for? There is not adequate record keeping by Austin Parks and Recreation, how would anyone know that the \$25,000 amount stated is correct? Could it have been more? What grants have been used for Mayfield Park?

Texas Parks and Wildlife has a grant program that has been cited by AYW as an additional source of funding.⁸ Are these grants being used in addition to Park Foundation Grants? I assume they are, otherwise it would not have been cited by AYW. I propose a public information request to Texas Parks and Wildlife requesting what kind of grants have been utilized for all City of Austin Parks or property. Maybe all governmental agencies it the listing should have a similar public information request?⁹ This should prove whether piggybacking or even triple grants are being used.

6

<http://www.blueavocado.org/content/tracking-volunteer-time-boost-your-bottom-line-complete-accounting->

⁷ Ibid, Section 6.2.1, p35.

⁸ http://www.corpsnetwork.org/index.php?option=com_content&view=article&id=193&Itemid=114

⁹ City of Austin's Invasive Species Management Plan.

Federal 6.2.1, p35, State 6.2.2, p39, Local 6.2.3, p40, or Private 6.2.4, p41

American YouthWorks - Project Funding in their own words.

“AYW can then invoice the project sponsor for the full cost of the crews, about \$700 per day, which includes tools, transportation, training, insurance, safety equipment, meals, etc. The State reimburses the project sponsor, which pays the invoiced amount from AYW, covers its own costs, and documents the matching funds or contributions.”¹⁰

Texas Parks and Wildlife Department Grants -

Grants are funded through a portion of Texas sales tax received on select sporting good items, and administered by the Recreation Grants Branch which funds five grant programs. These grant programs include: Outdoor Recreation, Indoor Recreation, Small Community, Regional, and Community Outdoor Outreach Program.

In Texas, Recreational Trail Program (RTP) provides over \$3.7 million annually, the largest source of funds for trail construction and improvements.

Texas Parks and Wildlife Department also administers the Texas apportionment of Federal Land and Water Conservation Funds.

American Youthworks has been involved in past financial management problems.¹¹ If they have so much to gain by being utilized by the city, why were they included in the formulation of the city invasive plan? A similar question could also be asked of Austin Parks Foundation. Both of these groups have agendas in addition to invasive removal.

IV. Herbicide Issues

American YouthWorks was included in the committee that formulated Austin’s new Invasive Species Management Plan. Are Federal training funds going to be used by American YouthWorks under the invasive species plan? Are grants for youth training being used by AYW for projects on city property? Is this the reason that there is such a push for herbicide use? The decision on herbicide use should be based on sound science not on the ability to utilize other grants such as federal funding for education of disadvantaged youth .

Internships and Professional Certification Opportunities

American YouthWorks provides paid and unpaid community based internships to participants interested in earning real world work experience. Internships are individualized to the student’s career interest and schedule. To enroll in an internship, a student must already be enrolled in American YouthWorks Charter High School. American YouthWorks job training program offers professional certifications in a variety of industry recognized fields. A participant must already be enrolled in a job training program to participate in a certification program. Past certification offerings include OSHA, PACT, TABC, and chain saw usage.¹²

V. Applicable City of Austin Codes

¹⁰ http://www.corpsnetwork.org/index.php?option=com_content&view=article&id=193&Itemid=114

¹¹ Nonprofit’s financial, management struggles have taken a toll. Austin American Statesman March 27, 2011

¹² <http://www.americanyouthworks.org/educational-services/student-services>

There are City of Austin codes that affect invasive species removal.¹³ Why are they not listed within appendix C? Sections 25 and 30 are the most obvious. These cover site plan requirements, exemptions, developments by the city, accountable entities, clearing of vegetation and more. Some of these codes are being ignored in invasive removal. Erosion control, mandated environmental assessments in flood plains, criminal enforcement are among these ignored codes.

VI. Control and Management

Page 108 of Meeting the Invasive Species Challenge listed within the City of Austin's Invasive Species Management Plan appendix (zip file) has a list that I believe would be useful in formulating the City's Plan. It includes several issues in decision making; flaws in methodology, lack of expertise, lack of coherence on issue, biological unknowns, insufficient information, and political impediments. These reverse processes should be taken into account. In a later page (p172) this article states that "Eradication of widespread invasives species may not be feasible." Issues like expanse of infestation along with how a species propagates should be addressed. Birds eating seeds and expanding propagation is similarly not addressed. Many other issues have been addressed within working group meetings but were not included.

Planning is not being addressed very well in the Austin's Plan. Addressing additional elements such as; 1. Project Goals and Timeline, 2. Existing Conditions, 3. Permitting, 4. Site Preparation, 5. Planting Plan, 6. Maintenance, 7. Monitoring and Success Criteria, 8. Responsibilities, and 9. Cost Analysis.¹⁴

VII. Public Comment

The working notes of 2/8/11 stated (page 4) within a chart that there would be between May and August 2011 a public comment period. This four month period envisioned has been abbreviated. This is probably because the planning process lagged. This period should be the same as originally intended. This is a very technical issue. This city having so many other resources like graduate UT students or statewide offices of environmental groups the public comment period should be extended in order to formulate the best management plan possible.

¹³ City of Austin, Texas Code of Ordinances. http://amlegal.com/austin_tx/

¹⁴ Restoration/Revegetation Plan Guidelines. http://ceres.ca.gov/tadn/eradproject/restor_guidelines.pdf

O'Toole, Matthew D

From: T Donovan <tomwdonovan@yahoo.com>
Sent: Monday, November 07, 2011 9:16 AM
To: O'Toole, Matthew D
Cc: ddawnleach@gmail.com
Subject: invasive plants

Matthew O'toole,

Some observations on the Invasive Species Management Plan.

Herbicide use:

triclopyr appears to be an effective stump killer. However, spraying may not be the safest method. The literature states that to be effective it needs to be applied to freshly cut cambium layer. How about a paint brush and small bucket. Recall that the cambium layer is only about 1/4 inch wide around the circumference of the stump. No over spray problem this way. No accidental involvement of other species.

The other two mentioned herbicides, both are broad spectrum, broad leaf poisons. glyphosate, a.k.a. Round Up kills um all. clopyralid has been banned in Seattle.WA because it accumulates in yard waste and mulch. All sources note that it is particularly effective against Asteraceae Fabaceae, Solanaceae and others. As I'm sure you know all daisy,legume, nightshade, violets make up a huge majority of our wildflowers.

Chinaberry:

Much of the information seems to anecdotal. For instance the drunk birds often mentioned. I would like to note that nothing except yeast is able to decompose these berries.

Dr. Wm. Marshall, the monarch butterfly expert, has observed them treetopping from chinaberry to chinaberry on their spring migration.

The literature notes that the sawdust from chinaberry is insecticidal.

Combine this with the herbicide mulch retention, and we have a nice stew that kills not only wildflowers but pollinators and other bugs.

To conclude this unedited rambling mess, I think there is a bit of fine tuning needed.

I applaud this large effort by you guys and look forward to its completion.

Tom Donovan, co-chair Williamson Creek greenbelt committee
Southwood Neighborhood Association
tomwdonovan@yahoo.com (512)447-1835

Thanks again for all your good work

LisaH

From: webapp@ci.austin.tx.us
Sent: Tuesday, November 01, 2011 8:44 AM
To: Hanson, Angela
Subject: Survey Completion: Invasive Species Management Plan

Follow Up Flag: Follow up
Flag Status: Yellow

The survey, Invasive Species Management Plan, was just completed.
The survey was completed at 11/01/11 at 8:44 AM Owner Key:
5F5F62A0-BB15-6C3F-50775DDF1A5E2B35

Q1) Name
A) LisaH

Q2) Affiliated organization or group (e.g. Neighborhood Association, non-profit group, etc)
A) na

Q3) Comments
A) I can't tell if this is included or not, but the plan should address city property that is leased out. The leasee maybe doesn't have to improve the invasive species situation, but they shouldn't make it worse, either. Thanks

This is an auto-generated message, please do not reply.

If you do not wish to receive more email results, please login to survey builder and remove your email address from the "send results" text box.

Thanks
-Admin

David M Kleiman

From: webapp@ci.austin.tx.us
Sent: Tuesday, October 18, 2011 12:20 AM
To: Hanson, Angela
Subject: Survey Completion: Invasive Species Management Plan

Follow Up Flag: Follow up
Flag Status: Yellow

The survey, Invasive Species Management Plan, was just completed.
The survey was completed at 10/18/11 at 12:19 AM Owner Key:
1578720B-CA14-47BD-F235616057E35561

Q1) Name

A) David M Kleiman

Q2) Affiliated organization or group (e.g. Neighborhood Association, non-profit group, etc)

A)

Q3) Comments

A) I recommend that the plan includes a prohibition on selling any invasive plant. The plants listed in the Grow Green booklet would be a start. This would apply to nurseries, big box stores, etc.

Besides getting rid of the ones already growing we need to stop new ones from being planted.

David Kleiman
1704 Corona Dr
Austin TX 78723

This is an auto-generated message, please do not reply.

If you do not wish to receive more email results, please login to survey builder and remove your email address from the "send results" text box.

Thanks
-Admin

Dora Smith

From: webapp@ci.austin.tx.us
Sent: Thursday, October 27, 2011 6:30 PM
To: Hanson, Angela
Subject: Survey Completion: Invasive Species Management Plan

Follow Up Flag: Follow up
Flag Status: Yellow

The survey, Invasive Species Management Plan, was just completed.
The survey was completed at 10/27/11 at 6:29 PM Owner Key:
47B7C06C-F88B-9A0E-06D3E7EFB6867FCB

Q1) Name

A) Dora Smith

Q2) Affiliated organization or group (e.g. Neighborhood Association, non-profit group, etc)

A)

Q3) Comments

A) What has the chinaberry tree done to harm us? Does it guzzle great quantities of water and I don't know it yet? Is there some invaluable species it's nudging out - no, don't tell me - maybe china berry trees are in danger of driving to extinction that water hogging mountain cedar! Chinaberry trees are pretty and provide lots of food to birds in the winter.

If a species is causing trouble, that's one thing, but let's not go on a maniacal witch hunt against plants.

Dora Smith
1902 West Loop
Austin, Texas 78758

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If you do not wish to receive more email results, please login to survey builder and remove your email address from the "send results" text box.

Thanks
-Admin

Monica Swartz (11/3/2011)

- Address ecological integrity; ways to support in wildlands; ecological health and resistance
- Most invasive plants are ornamentals
- White-tailed deer consuming native plants and not ornamentals
- Sustainability in funding and research, development of biocontrol
- Community pride in native appearance
- Integrate fire management, increased biomass & ladder fuels, lower water availability, more fire prone
- Have council work against TXDOT, use of KR bluestem on highway easements
- How to identify new species of concern and trigger point for action
- Identify new alternative techniques of treatments, grass roots... example in Mexico with Tamarisk
- Funding: property fee on those are a source of invasive infestation/propagation
- Plan is analyst approach, identify as not being bottom-less pit

Cliff Tyllick

From: webapp@ci.austin.tx.us
Sent: Wednesday, October 19, 2011 5:28 AM
To: Hanson, Angela
Subject: Survey Completion: Invasive Species Management Plan

Follow Up Flag: Follow up
Flag Status: Yellow

The survey, Invasive Species Management Plan, was just completed.
The survey was completed at 10/19/11 at 5:27 AM Owner Key:
1BB904B9-0446-CBCD-9C89F48C29270826

Q1) Name

A) Cliff Tyllick

Q2) Affiliated organization or group (e.g. Neighborhood Association, non-profit group, etc)

A)

Q3) Comments

A) In the early 1990s, I was an ardent supporter of efforts to plant enough trees to provide a canopy that would make Austin a cooler place to live. At one point, I was Secretary of Austin ReLeaf and President of TreeFolks and author of the text for the revised Tree-Growing Guide for Austin and the Hill Country.

In that revision, our committee earnestly tried to cull out the trees that did not belong in a document perceived as a recommended list: the Arizona ash, the Chinese tallow, and the Chinese pistache.

We managed to remove two out of three. The Chinese pistache remained because the person with the most expertise in urban forestry insisted that it was not invasive.

He was wrong. It is seeding out faster than hackberries. In 20 years, it will be more prevalent than the chinaberry in our wildscapes.

The recent drought has revealed something else about the Chinese pistache: It is more drought-tolerant than many of our native trees.

Thank you for adding it to the list of Austin's 24 most invasive species. I hope that we can energize other communities to do the same.

It's a fine tree, but it never should have been recommended for planting outside its native range.

This is an auto-generated message, please do not reply.

If you do not wish to receive more email results, please login to survey builder and remove your email address from the "send results" text box.

Thanks
-Admin

Nancy Webber

From: webapp@ci.austin.tx.us
Sent: Wednesday, October 26, 2011 8:17 PM
To: Hanson, Angela
Subject: Survey Completion: Invasive Species Management Plan

Follow Up Flag: Follow up
Flag Status: Yellow

The survey, Invasive Species Management Plan, was just completed.
The survey was completed at 10/26/11 at 8:16 PM Owner Key:
42F38FCA-A0E0-D6B8-6D329448174F7ED2

Q1) Name

A) Nancy Webber

Q2) Affiliated organization or group (e.g. Neighborhood Association, non-profit group, etc)

A) Native Plant Society of Texas

Q3) Comments

A) I have seen the overwhelming dominance that nonnative species such as wax leaf ligustrum and chinaberry exercise in taking over natural areas. I personally have been involved in eradication efforts in the City water quality lands. I whole-heartedly support a BAN on the sale of these species in our city. The Management Plan is a good first step.

This is an auto-generated message, please do not reply.

If you do not wish to receive more email results, please login to survey builder and remove your email address from the "send results" text box.

Thanks
-Admin

O'Toole, Matthew D

From: O'Toole, Matthew D
Sent: Wednesday, September 28, 2011 11:59 AM
To: Daniel White
Subject: Re: Invasives Plan
Attachments: image001.png

Daniel,

I do appreciate the amount of time and resources you have invested in Stacy Park, and the knowledge you have gained from taking on such a large task.

As project manager of this plan, it is my duty to make sure the process moves along in an effective and organized fashion. Our process is to have an internal review, a larger organizational review, and then a public review of the plan. We are in the stage of accepting comments from the larger organizational review.

We are interested in taking your thoughts, both written and verbal, at the appropriate time. Your knowledge and expertise are a valued asset to the plan, and we will take those at our public forum(s) in the near future.

Regards,

Matt O'Toole

On Sep 28, 2011, at 10:24 AM, Daniel White wrote:

Mr. O'Toole--

I have just recently finished the largest ever invasives control via herbicide use in Austin, Texas' history at Stacy Park. It is one of the largest invasives control efforts ever done, and I am certain that it, as opposed to all the others done before by various parties, most of whom are on this board, will be the most successful. I think it inappropriate that my knowledge and expertise gets shuffled off into the citizens' comments ghetto that you and your fellow boardmembers seem happy to shove me into. I think it necessary that you there take advantage of my knowledge and expertise and contact me and see about attending a Stacy Park field trip. Figure at least 90 minutes out in the field, 2 hours if you've got lots of questions, which I trust you will.

Sincerely,

Daniel N. White

From: motoole@wildflower.org
To: louis_14_le_roi_soleil@hotmail.com
CC: Angela.Hanson@ci.austin.tx.us
Subject: RE: Invasives Plan
Date: Tue, 27 Sep 2011 16:47:26 +0000

Daniel,

Thanks for the interest in the plan.

O'Toole, Matthew D

From: Zoila Vega-Marchena <zvega@austin.rr.com>
Sent: Thursday, November 10, 2011 2:20 PM
To: Waitt, Damon E; City PARD Forestry Angela Hanson; City PARD Rene Barrera; Angela.Gallardo@austintexas.gov; cmccabe@austinparks.org; CSheffield@americanyouthworks.org; Eric.Stager@austinenergy.com; Jessica.Wilson@austintexas.gov; John.Gleason@austintexas.gov; Keith.Mars@austintexas.gov; kelly.bender@tpwd.state.tx.us; Matt.McCaw@austintexas.gov; O'Toole, Matthew D; Bertelsen, Michelle M; Gallo, Travis
Subject: Comments, Invasives Species Management plan

Great job! Please, accept the following comments regarding the Invasive Species Management Plan. It's not criticism, but helpful feedback. I really like this plan but I think with a few minor adjustments, it would be an even clearer plan. Lots of good work, good plan, and fantastic background information. Good team work!

I submitted comments via city's web site, but it was limited to 4000 characters. There shouldn't be a limit for comments on such an important plan. I've dedicated a lot of time to review this plan because I think the group has done a great job and with minor tweaks, it could be an even clearer plan.

1) **MANAGEMENT PLAN SECTION IS NOT CLEAR DUE TO FORMATTING**

This is an excellent document. However, I see it more as a report of current procedures, best management practices, good background and excellent funding section because it's missing the planning section of the Management **Plan**, unless you realize that part of the plan is in Figure 5.1. The management plan needs to be clearer, to have a chapter of its own. I didn't understand how these goals are going to be implemented, until I read Section 6 that states that by hiring 2 FTEs, but that should be in section 5. Including the 5 year goals in Figure 5.1 is good, but the text that is in this figure needs to be included as text in Section 5 as well. In addition, some text that is in section 6 needs to be added to the 5 yr. goals section.

There is no Management Plan chapter in this document. There is a "5 yr goals" section and a "Management" section. Chapter 4 is NOT a management plan, but management of invasives and includes procedures, management practices, recommendations for best management practices, etc. But, there is enough information in the text to correct this easily. Chapter 5 can be titled "5 yr. Management Plan", instead of "5 yr. goals". See text below copied from plan with my additions shown as underlined text in blue.

"Chapter 5 Management Plan 5-yr-goals

Five Year Goals

Success for this plan, in a general sense, is defined as effective interdepartmental coordination and, ultimately, a reduction in invasive species cover of at least 25% in 5 years on city managed properties.

What are the 5 yr. goals? Is there another goal other than reducing invasives? Are these goals: effective interdepartmental coordination? Standard procedures? Prevention? etc.

Management Plan

~~In order~~-To track progress toward these long term goals (what long term goals?), the working group developed a set of measurable 5 year objectives which will track both plan implementation (are ~~called for~~ actions planned in place?) and plan effectiveness (is invasive coverage reduced?). Early on, emphasis should be on implementation and will shift, over time, toward measures of effectiveness.

We suggest that the plan, and progress made in carrying out the plan, be evaluated every five years. Unless otherwise stated, the target date for the following objectives is 2016 or five years from plan adoption, whichever comes later.

Five Year Objectives have been placed in four categories: Measurement, Control, Standard Procedures and Public Education (see Figure 5.1):

- *Measurement:*

- 1) *Use a standardized centralized digital record-keeping system for invasive species management for all city-managed land*

- *Control:*

- 2) *Determine baseline data for Invasive species distribution in City-managed properties.*

- 3) *Each Dept. will have implemented invasive management actions on at least 25% of their total acreage.*

- *Standard Procedures*

- 4) *Ensure that appropriate employees are evaluated on performance of standard procedures for invasive species*

- 5) *Codify plan and procedures in City Code for all CIP and Public projects*

- 6) *100% of vegetation management employees will receive training*

- *Public education:*

- 7) *By Jan 1, 2012 the city no longer purchases or recommend known invasive species.*

- 8) *Establish a baseline measure of public attitudes towards invasive species.*

The working group recommends (text that follows is from Chapter 7) that invasive species management programs remain the responsibility of the individual

departments with jurisdiction over city-owned properties. In addition, (Text that follows is from 6.1.1 below needs to be repeated under Chapter 5:) the Working Group recommends that two full-time equivalent positions – an Environmental Conservation Program Coordinator and a GIS Analyst - be created to manage the implementation of the Invasive Species Management Plan and to facilitate communication between city departments. Given the prospects of a relatively stable long-term funding, as well as synergies with Watershed Protection’s mission and existing staff capabilities, there is consensus that Watershed

Protection should house the proposed new positions.

The Invasive Species Coordinator would work with city departments and partners to organize and catalog assessments, treatments and restoration activities among the various properties of all city departments. The Coordinator would plan and develop programs to train city staff and collaborate with internal and external agencies to meet plan goals. Additionally, the Coordinator would identify and explore funding opportunities for the overall invasive species management program as well as future salary requirements. It is also recommended that the coordinator’s activities and priorities be determined by an Invasive Species Committee comprised of representatives of the six departments involved in invasive management.

The GIS Analyst would provide support to the Coordinator by updating and maintaining the spatial database of information related to assessments, treatments, restoration and follow-up activities. With six city departments working on various invasive species projects, a centralized repository is critical for management and information sharing.

Public education is particularly important for the success of this plan, etc. “

2) MANAGEMENT PLAN VS WORK PLAN AND HOW TO INTEGRATE PLAN INTO EXISTING CITY PROGRAMS

Plan states that “Portland has a three-year work plan and ten year goals to integrate invasive plant management into existing city programs and reduce invasive plant coverage.” Will this management plan get integrated into existing city programs (interdepartmental unification)? How? The environmental coordinator will coordinate and prioritize invasive removals. Who will try to unify the various city departments? Will that be the committee’s role?

Where is the work plan? (Short term plan on how to achieve this). If there wasn’t enough time to develop a work plan and details, then the working group should recommend that working group continues meeting to develop work plan and details on how to unify standards and procedures for invasive removal in all city departments.

3) INTER-DEPARTMENTAL INITIATIVE ON SUSTAINABLE INTEGRATED LAND MANAGEMENT

An interdepartmental initiative on Sustainable Integrated Land Management is an excellent idea and is much needed.

4) VOLUNTEERS

Volunteers should be **trained**, made aware of these issues, be **asked to minimize their impact to the area**, and be **supervised** until they are experienced enough to supervise new volunteers. Volunteers should be **divided into smaller groups with a team leader** for each group

A standardized system for training and certifying volunteers for different levels of activities is critical. Consistent volunteer training is important. Volunteers need to know how to do the work while being aware of minimizing soil compaction, soil erosion, and site disturbance. Volunteers also need to be supervised, to be separated in small groups that have a volunteer leader who is experienced on the work and minimizing impacts. There should be different levels of volunteer skills and training that has been evaluated with reasonable hands on and theoretical tests. The tests shouldn't be too easy. This should be a serious effort, and yet not overwhelming. The most experienced volunteers should be able to work on their own.

Volunteers need to demonstrate that they know how to do the work. Attending classes and getting titles (such as Urban Forest Steward) doesn't mean that volunteers know how to do the work.

In some instances, it's better for the crew to do the work than for volunteers. Volunteers shouldn't be called when the site conditions require it, such as too much erosion/site impact if work is done by volunteers, sensitive areas, herbicide required, large trees, steep slopes, etc.

Volunteers' time should be respected and they shouldn't be asked to do tasks that are not important, or only temporary. Volunteers should be respected by giving them a meaningful job to do, and appreciating what they do. For instance, we have been watering for 3 months, every 3 weeks, a tree that we didn't know Forestry was going to remove. Where we going to find out when we got up at 4am on day to water the tree and the tree was gone? Communication is important. Being "partners" doesn't mean that volunteers do the work but can't participate in the planning. Involve volunteers so they have some ownership of the project.

5) HERBICIDE APPLICATION BY VOLUNTEERS

*The steps required to allow a volunteer to perform certain tasks, such as **herbicide application**, should also be clearly defined. A volunteer certification process/workshop should be developed that would enable volunteers to become qualified to use herbicides and chain saws (through Texas Department of Agriculture courses).*

It is not sufficient for volunteers to be qualified to use herbicides and chain saws through Tx Dept, of Agriculture courses. The group or city department where the volunteers work, needs to evaluate on hands proficiency and be involved on supervising the work, to be responsible and accountable for this specialized work. Volunteers need to demonstrate hands on proficiency, have no previous history of damaging public places with herbicides or others, be insured and bonded to cover any damage they may cause intentionally or not, be held accountable for any damage they cause, be supervised by city staff, follow plans developed by city staff, etc. Once volunteers are experienced, supervision may decrease.

The same applies for volunteers using chain saws, with the addition that those volunteers need to be responsible for mitigation and fines for any illegal tree removal done by them. Volunteers with chain saws should not be allowed to prune or remove public trees unless a plan is approved and vetted by the public and boards, all public tree care and tree removal permits are approved, etc.

The UFB and Forestry are working on developing guidelines for volunteers that include several levels of skills and training, and activities that can be allowed accordingly.

6) NEIGHBORHOOD NOTIFICATION

*Public perception..., **it is important to notify neighborhoods that may be affected by the work***

Neighborhoods that have adopted the park, greenbelt or area where the work will be done should be not only notified but **included in the planning and implementation** of the invasive removal project. **All invasive removal plans should be reviewed** by the public and boards (if involving herbicides and chain saws), as necessary.

7) BEST MANAGEMENT PRACTICES

*Public perception... Various techniques such as **wind-rows, chipping, and complete removal of woody slash***

- Mulching, chipping

However, mulch suppresses all germination which can complicate later revegetation efforts.

There has to be a balance that mimics nature when deciding whether or not to mulch the site. Mulch interferes with re-vegetation, but trees need woody debris. A healthy forest needs leaves and woody debris to go back to the soil. From the trees point of view, woody debris should be mulched on site as much as possible, and spread thinly (1-2 inches deep max) to not prevent brief showers from reaching the tree roots in a time of severe drought. Woody debris is necessary in the forest for wildlife. Some wooden debris should be left on site.

Consider using more portable chippers to chip some of the removed invasives debris on site. When large debris from invasive trees needs to be dragged out of the site, the large branches should be cut into smaller more manageable pieces to not impact the site (trample over small native plants). It would be better to chip the debris on site (don't chip roots), and spread the fresh mulch thinly, 1-2 inch deep, around trees. This is more sustainable than transporting debris out to make mulch and then transporting mulch back in a distant future.

- Windrows

Windrows prevent re-vegetation and should be used only in a few areas where needed for water flow, and not as a way to dispose of invasives debris when alternatives are possible. Windrows should not be built too high (not higher than 2-3 ft) or too wide (not wider than 2 ft.) to not prevent re-vegetation.

- Soil Impact

Limit soil disturbance, prevent soils damage before restoration is required ...each smaller group should be assigned to a specific area to minimize impact on the soil and native vegetation.

This is critical but not uniformly done currently. Minimize impact on soil, trees and all vegetation when removing invasives. All volunteers and staff should take care of not overly impacting the soil, not eroding it, not compacting it when dragging the invasives debris out of the area. Confine traffic to a path or a couple of paths. Work in small groups. Define an area to stack the debris, don't throw debris all over the place, and don't drag debris over native plants and tree saplings.

Bare soil tends to erode easily and can be easily reinvaded. Potential damage to soil should be weighed against the possible benefits of invasive removal. If infestation is extensive and complete removal of invasives would require damaging the soil to the point that active restoration of the soil (ripping, amending) would be required, than a phased approach should be adopted in which treatment and restoration occurs little by little...In the process of treating and removing invasive species, the soil may be disturbed and left bare. In some cases, compaction reduction activities and organic soil amendments may be needed to restore soil to a useful state...Best to prevent than to restore.

All of these are critical. Please, ensure that all volunteers follow these practices (teach, supervise, and enforce). Re-vegetation depends on the soil, water and amount of light (and surrounding vegetation that robs the nitrogen and water). Recently exposed or disturbed areas should be quickly revegetated with native species.

- Work in Phases whenever possible.

Don't do mega-removals of invasives that leave large areas bare. Invasives do provide shade, food, and shelter for wildlife, plus shade helps the ecosystem. Tailor plans to sites, not a single solution for all. Consult with stakeholders that know the area and its use.

complete removal significantly damage the soil or leave large areas bare, thus necessitating intensive restoration efforts? If so, a phased approach, in which areas are treated and restored little by little, is likely appropriate.

- Impact on creeks (Creek beds and soil banks)

Minimize impact of removal on riparian areas. These areas are more sensitive and require more care when removing invasives.

- Re-vegetating

Have a re-vegetation plan before removing invasives, with funding and resources allocated.

- Re-vegetating with small tree saplings

Re evaluate benefit of planting native tree saplings when re-vegetating. Minimize impact on land when planting tree saplings (don't step over native plants, don't compact the soil with large groups in the same spot).

- Evaluate survival rate of tree saplings planted without irrigation or supplemental watering. I think tree sapling mortality rate is so high that it may be best to combine some planting of 1-5 gallon containers that get irrigated, or to not plant tree saplings that don't get irrigated. This is a forestry technique, planting thousands so dozens survive, that is not applicable to urban areas but large forests. In the mean time, soil will get compacted in the preserves by the hundreds of volunteers planting the hundreds of tree saplings that will not survive.

- Water
Re-vegetation needs water, plan for this. Re-vegetation without water is very slow and allows invasives to come back. Irrigate tree saplings, including bare root, when re-vegetating. Nothing grows and survives without water.

8) IMPACT ON WILDLIFE

Minimize impact on wildlife. Invasive trees such as Chinaberries provide food, shelter and shade to wildlife (some wildlife does eat the berries from chinaberries). Ideally, invasive species should be removed in phases, in small areas, to allow re-vegetation to occur. Re-vegetation, even with water, takes time. In the mean time, wildlife doesn't have the shade, shelter and food that it had before the removal. The effect of this is worse the larger areas are removed. Don't remove a large amount, or all, shade in an area (from large chinaberries and other invasive trees) unless absolutely necessary. It's better for volunteers to come back, than to do a mega-removal of invasives in an area, when this reduces shade significantly. Dead invasive trees can provide habitat for wildlife. Keep the snags.

9) **ASK LOWE'S, HOME DEPOT AND LOCAL NURSERIES TO NOT CARRY INVASIVES VOLUNTARILY.**- Face the issue and try to work things out.

10) **WORK WITH TX DEPT OF AGRICULTURE (AND TX NURSERY ASSOCIATION) TO ADD MORE INVASIVE SPECIES TO STATE LIST (that is the only one that can be labeled as invasive)**

Best regards,
Zoila

Zoila Vega, Ph.D.
Austin Heritage Tree Foundation

FORMAT, TYPOS, REWORDING:

- pg 6: *enhance Johnsongrass growth Thus, the ability of Johnsongrass* >>>add period between sentences, space between Johnson and grass
- pg 14: *Environmental Criteria Manuel*>>>Manual
- pg 14: *At this time, the overall strategy is ad hoc*>>>what is ad hoc (some people don't know)? Rephrase
- pg 16: *into day to day operations. Land management,*>>>too many spaces in between 2 sentences. Same with next 2 sentences.
- All over document, some areas have 2 spaces in between sentences, others have only 1, others have more than 2 spaces. Be consistent.
- pg 16: table 2.2 should go after text in 2.2 ends. Premature placement of table.
- pg 18: *tree,*>>>trees
- pg 18: *likeminded*>>>like minded
- pg 19: *October1995*>>>needs space in between words
- pg 19: *a national association of like organizations*>>> of similar organizations?
- pg 21: *Once a species becomes widely established, control efforts become costly and eradication is unlikely, therefore early detection and rapid response efforts increase the likelihood that invasions will be halted and eradicated.*>>> eradication is unlikely. Therefore, early detection...
- pg 21: leave a space line in between paragraphs 1, 2, 3. Text is too crowd without the space line.
- pg 24: table 4.5.2 is oriented opposite to the orientation of the previous tables shown in landscape format, Be consistent, best to orient landscape pages 90 degrees clockwise
- pg 24, in table, *Chinese parasoltree, bermudagrass, hollyfern*>>>add spacing between words
- pg 25: *are conducive to moderate to high rates*>>>conducive to rates of dispersal and establishment that vary from moderate to high rates...
- pg 25 to 26, difficult to realize that pg. 25 was part of the table, and thus text continuation is missing from pg. 23 to 26. Perhaps enclose text in pg 25 on a table (put text in a rectangle), to show that it's part of the table, and that the text in page 23 continues in page 26?
- pg 27: *What the law requires should be the minimum for all departments*>> The minimum for all departments should be what the law requires.
- pg 28 and 29: *In order to track* >>To track

- pg 29: *track both plan implementation (are called for actions in place?)*>>>Difficult to understand, rephrase: “have the planned actions been implemented?” Or, “are the planned actions in place to be implemented?”
- pg 37: *measurable environmental results. New paragraph The objective of the capacity building*>>>formatting, add line between paragraph.
- pg 38: *permanent easements. NEW paragraph Applications will be rated...or an eligible entity. . New paragraph Expanding land*>>> formatting, add line between paragraph.
- pg 39: *in North America. New paragraph Eligible applicants include*>>> formatting, add line between paragraph.
- pg 40: *directly for funding. New paragraph A project must address*>>> formatting, add line between paragraph. Same under the APF, COA, UFP paragraphs.



COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

*** Please Be Aware ***

Your information is subject to the Open Records Act.

Name (Please Print)

Stephen Parker

Comments:

Thank you for pushing the Invasive Species Management objective.

Affiliation (Organization)

Contact (Optional)

Phone:

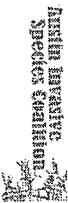
Email Address:

valuelk1@gmail.com

Please indicate your position on this item:

- FOR
- AGAINST
- NEUTRAL/UNDECIDED

Signature:



COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

*** Please Be Aware ***

Your information is subject to the Open Records Act.

Name (Please Print)

Monica Swartz

Affiliation (Organization)

St. Edwards University

Contact (Optional)

Phone: 512 ~~502~~ 233 1619

Email: MONICA.SWARTZ@STEDWARDS.EDU

Please indicate your position on this item:

FOR w/ significant

AGAINST

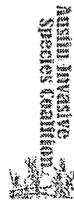
NEUTRAL/UNDECIDED REVISION

Signature:

M. Swartz

Comments:

Empty box for comments.



COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

*** Please Be Aware ***

Your information is subject to the Open Records Act.

Name (Please Print)

PAM LYNN

Comments:

Affiliation (Organization)

NPSOT

THINK BIG

Contact (Optional)

Phone: 512-441-1099

Email Address: ALDOUSETH@CLEAR.NET

GOOD WORK!!

Please indicate your position on this item:

FOR

AGAINST

NEUTRAL/UNDECIDED

Signature:



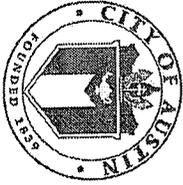
COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

*****Please Be Aware*****

Your information is subject to the Open Records Act.

Name (Please Print) <i>Terry DuBose</i>	Comments: <i>Good Program. — GD</i>
Affiliation (Organization) <i>So. River City Community - Mark</i>	
Contact (Optional) Phone: <i>512 - 826 - 8833</i> Email Address: <i>TerryDuBose@SRCLD.org</i>	
Please indicate your position on this item: <input checked="" type="checkbox"/> FOR <input type="checkbox"/> AGAINST <input type="checkbox"/> NEUTRAL/UNDETERMINED Signature: <i>Terry DuBose</i>	



COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

Please Be Aware

Your information is subject to the Open Records Act.

Name (Please Print)

Kirsten Slade

Affiliation (Organization)

Contact (Optional)

Phone:

Email Address: kirsten.slade@gmail.com

Please indicate your position on this item:

- FOR
- AGAINST
- NEUTRAL/UNDECIDED

Signature:

Slade

Comments:

- include language as to how this plan is a piece of a whole endeavor to ensure ^{ecological} integrity + ^{plan's} how to interface with ecological restoration efforts,



COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

Please Be Aware

Your information is subject to the Open Records Act.

Name (Please Print)
Elizabeth Bezanon

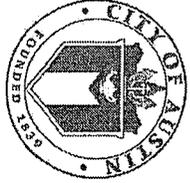
Affiliation (Organization)
citizen

Contact (Optional)
Phone: 512-306-8745
Email:

Please indicate your position on this item:
 FOR
 AGAINST
 NEUTRAL/UNDECIDED

Signature: Elizabeth Bezanon

Comments: I wholeheartedly support the city finally getting involved in invasive species removal. Thank you so much! It is just fine.



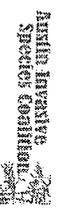
COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

*** Please Be Aware ***

Your information is subject to the Open Records Act.

Name (Please Print) <i>Glee Ingram</i>	Comments: <i>4715 UA - Airport A-Park Agreement</i>
Affiliation (Organization) <i>Greenbelt Guardians - Barton</i>	
Contact (Optional) Phone: <i>441-3278</i> Email: <i>glee@greenbeltguardians.net</i>	
Please indicate your position on this item: <input checked="" type="checkbox"/> FOR <input type="checkbox"/> AGAINST <input type="checkbox"/> NEUTRAL/UNDECIDED Signature: <i>Glee Ingram</i>	



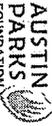
COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

*** Please Be Aware ***

Your information is subject to the Open Records Act.

Name (Please, Print) Phil Burns	Comments: great start! The funding issues and herbicide problems as stated in my written comments.
Affiliation (Organization) Citizen	
Contact (Optional) Phone: 350-8639 Email: philburns-17@hotmail.com	
Please indicate your position on this item: <input checked="" type="checkbox"/> FOR Both <input checked="" type="checkbox"/> AGAINST <input type="checkbox"/> NEUTRAL/UNDECIDED Signature:	



COMMENT CARD

INVASIVE SPECIES MANAGEMENT PLAN

*****Please Be Aware*****

Your information is subject to the Open Records Act.

Name (Please Print)

Leslie Bush

Comments:

Thank you for your hard work on this important, forward-looking plan.

Affiliation (Organization)

Native Plant Society - Austin
Breda Wild

Contact (Optional)

Phone:

Email Address:

leslie.bush@gmail.com

Please indicate your position on this item:

- FOR
- AGAINST
- NEUTRAL/UNDECIDED

Signature:



City of Austin Invasive Species Management Plan

Appendix F



TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Arundo donax
Synonyms:	
Common names:	Giant Reed
Evaluation date (mm/dd/yy):	10/27/2009
Evaluator #1 Name/Title:	Amanda Turley, Justin Adams, Shiho Yamamoto, Anastasia Jones, Crayle, Chris Lester
Affiliation:	University of North Texas
Phone numbers:	940-369-8889
Email address:	
Address:	940-369-8889
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	4
1.2	Impact on plant community	A	4
1.3	Impact on higher trophic levels	B	4
1.4	Impact on genetic integrity	D	4

Impact

Enter four characters from Q1.1-1.4 below:

AABD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	B	4
2.2	Local rate of spread with no management	A	4
2.3	Recent trend in total area infested within state	U	4
2.4	Innate reproductive potential Wksht A	B	4
2.5	Potential for human-caused dispersal	B	4
2.6	Potential for natural long-distance dispersal	A	4
2.7	Other regions invaded	C	4

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

15

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	3
3.2	Distribution/Peak frequency Wksht C	A	3

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3.84

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Rev'd Sci. Pub'n back
Identify ecosystem processes impacted: Arundo donax forms thick massive stands that increase the risk of wildfire occurrence. The stands change the morphology of the water channel by hindering flow, and increasing sediment deposition (Everitt, Yang, Alaniz, Davis, Nigling and Deloach, 2004). Mechanical removal and use of herbicides compromise water conservation efforts, and affect flood control (Boose & Holt, 1999)	
Sources of information: Boose, A.B and Holt, J.S.1998. Environmental effects on asexual reproduction in Arundo donax. Weed Research. 39:117-127. Everitt, J.H.,Yang, C., Alaniz, M.A., Davis, M.R., Nigling, F.L., and Deloach, C.J. 2004. Canopy spectra of giant reed and associated vegetation. Journal of Range Management. 57	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev'd Sci. Pub'n back
Identify type of impact or alteration: Stands of Arundo donax form thick dense fibrous root systems that penetrate deep into the soil (Perdue, 1958). They displace native riparian stands of cottonwood, willows, and others due to the thickness of the stands and their root systems (Dudley, 2000; Everitt, Yang, Alaniz, Davis, Nigling and Deloach, 2004).	
Sources of information: enter text here Dudley, T.L. 2000. Arundo donax. In: Bossard C.C., Randall, J.M. and Hoshovsky M.C. (eds), Invasive Plants of California's Wildlands, 53:58. University of California Press, Berkeley. Everitt, J.H.,Yang, C., Alaniz, M.A., Davis, M.R., Nigling, F.L., and Deloach, C.J. 2004. Canopy spectra of giant reed and associated vegetation. Journal of Range Management. 57 (5):561-56. Perdue, R. E. Jr. 1958. Arundo donax- A source of musical reeds and industrial cellulose. Economic Botany. 12:368-404.	
Question 1.3 Impact on higher trophic levels	B Rev'd Sci. Pub'n back
Identify type of impact or alteration: Arundo donax does not appear to provide significant food or habitat for native species. In fact, several species including the endangered southwestern willow flycatcher (Empidonax traillii extimus) and the arroyo toad (Bufo californicus) have lost habitat to Arundo. (Bell, 1997; Lawson, Giessow, and Giessow, 2005). A. Donax causes a significant reduction in abundance and diversity of invertebrate arthropod along the riparian zone in central California (Herrera & Dudley, 2003). A. donax creates uniform stands that disturb habitats of many riparian bird species, particularly Bell's vireo (Vireo bellii) (Yong and Finch, 1997).	
Sources of information: Bell, G. 1997. Ecology and management of Arundo donax, and approaches to riparian habitat restoration in Southern California. In Brock, J. H., Wade, M., Pysek, P., and Green, D. (Eds.): Plant Invasions: Studies from North America and Europe. Blackhuys Publishers, Leiden, The Netherlands, pp. 103-113.	

Herrera, A.M. and Dudley, T.L. 2003. Reduction of riparian arthropod abundance and diversity as a consequence of giant reed (*Arundo donax*) invasion. *Biological Invasions* 5: 167-177.

Lawson, D.M., Giessow, J.A., and Geissow, J.H. 2005. The Santa Margarita River *Arundo donax* Control Project: Development of Methods and Plant Community Response. USDA Forest Service Gen. Tech. Rep. 195: 229-244

Yong, W., and Finch, D.M. 1999. Population trends of migratory landbirds along the middle Rio Grande. *The Southwestern Naturalist* 42 (2): 137-147.

Question 1.4 Impact on genetic integrity

D Rev'd Sci. Pub'n [back](#)

Identify impacts: In the United States, *Arundo donax* does not reproduce sexually and therefore has little to no effect on genetic integrity of native species (Decruyenaere and Holt, 2004; Cosentino, Copannie, V., D'Agosta, Sazone, and Mantineo, 2006; Everitt, Yang, Alaniz, Davis, Nigling and Deloach, 2004; Khudamrongsawat, Tayyar, and Holt, 200). No viable seeds have been found in the United States all reproduction as been asexual through spread of rhizomes and pieces of shoots or roots that sprout at the nodes (Everitt, Yang, Alaniz, Davis, Nigling and Deloach, 2004; Ahmad, Liow, Spencer, and Jasieniuk, 2007).

Sources of information: Ahmad, R. Liow, P.S., Spencer, D.F., and Jasieniuk, M. 2007. Molecular evidence for a single genetic clone of invasive *Arundo donax* in the United States. *Aquatic Botany*. 88:113-120.

Cosentino, S.L., Copannie, V., D'Agosta, G.M., Sazone, E., and Mantineo, M. 2005. First results on evaluation of *Arundo donax* L. clones collected in Southern Italy. *Industrial Crops and Products*. 23:212-222.

Decruyenaere, J.G. and Holt, J.S. 2004. Seasonality of clonal propagation in giant reed. *Weed Science* 49:760-767.

Everitt, J.H., Yang, C., Alaniz, M.A., Davis, M.R., Nigling, F.L., and Deloach, C.J. 2004. Canopy spectra of giant reed and associated vegetation. *Journal of Range Management*. 57 (5):561-56.

Khudamrongsawat, J., Tayyar, R., and Holt, J.S., 2004. Genetic diversity of giant reed (*Arundo donax*) in the Santa Ana River, California. *Weed Science* 52: 395-405.

Invasiveness

Question 2.1 Role of anthropogenic and natural disturbance in establishment

B Rev'd Sci. Pub'n [back](#)

Describe role of disturbance: *Arundo donax* often spreads through natural disturbances such as flooding and deposition which move pieces of rhizomes or stalks containing nodes into new areas where they rapidly sprout (Boose and Holt, 1998). Any disturbance that breaks up the shoots or rhizomes has potential to spread this plant to new areas. Bulldozers, plows and other mechanical breakup of rhizomes and shoots by humans may lead to its spread (Boland, 2006). Pieces of shoot containing a node have been shown to sprout new growth even 123 days after separation from parent plant, while rhizomes sprouted up to 132 days after separation. The nodes have also been shown to sprout after both extreme water logging and burial up to 25 cm deep in depth (Boose and Holt, 1998). Decruyenaere and Holt reported that *Arundo donax* spread faster and to a greater degree in nitrogen rich wetlands as compared to low nitrogen wetlands in which a winter dormancy period occurred (2004).

Sources of information:

<p>Boland, J.M., 2006. The importance of layering in the rapid spread of <i>Arundo donax</i> (Giant Reed). <i>Madrono</i>. 53(4):301-312.</p> <p>Boose, A.B. and Holt, J.S. 1998. Environmental effects on asexual reproduction in <i>Arundo donax</i>. <i>Weed Research</i>. 39:117-127.</p> <p>Decruyenaere, J.G., and Holt, J.S., 2004. Seasonality of clonal propagation in giant reed. <i>Weed Science</i> 49:760-767.</p>	
<p>Question 2.2 Local rate of spread with no management</p>	<p>A Rev'd Sci. Pub'n back</p>
<p>Describe rate of spread: Under favorable conditions, <i>A. donax</i> may grow at rates of 0.3 to 0.7 meters per week (Perdue, 1958). It grows successfully in broad soil preferences ranging from clay, loamy to sandy soils up to depths of 25 cm below ground (Boose and Holt, 1998). Due to its rhizomes being protected below ground, <i>A. donax</i> can resprout when cut or burned. This allows it to take over areas before native vegetation can recuperate (Boland, 2006). Flooding is the major dispersal agent of this species (Dudley, 2000).</p>	
<p>Sources of information:</p> <p>Boland, J.M. 2006. The importance of layering in the rapid spread of <i>Arundo donax</i> (Giant Reed). <i>Madrono</i>. 53(4):301-312.</p> <p>Boose, A.B. and Holt, J.S. 1998. Environmental effects on asexual reproduction in <i>Arundo donax</i>. <i>Weed Research</i>. 39:117-127.</p> <p>Dudley, T.L. 2000. <i>Arundo donax</i>. In: Bossard C.C., Randall, J.M. and Hoshovsky M.C. (eds), <i>Invasive Plants of California's Wildlands</i>, 53:58. University of California Press, Berkeley.</p> <p>Perdue, R. E. Jr. 1958. <i>Arundo donax</i>- A source of musical reeds and industrial cellulose. <i>Economic Botany</i>. 12:368-404.</p>	
<p>Question 2.3 Recent trend in total area infested within state</p>	<p>U Rev'd Sci. Pub'n back</p>
<p>Describe trend: Found along riparian zone of the Rio Grande in southwest and west Texas (Everitt, Yang, Alaniz, Davis, Nigling and Deloach, 2004).</p>	
<p>Sources of information: Everitt, J.H., Yang, C., Alaniz, M.A., Davis, M.R., Nigling, F.L., and Deloach, C.J.. 2004. Canopy spectra of giant reed and associated vegetation. <i>Journal of Range Management</i>. 57 (5):561-56</p>	
<p>Question 2.4 Innate reproductive potential</p>	<p>B Rev'd Sci. Pub'n back</p>
<p>Describe key reproductive characteristics: <i>A. donax</i> does not produce viable seeds in North America; rather it spreads vegetatively (Dudley, 2000; Everitt, Yang, Alaniz, Davis, Nigling and Deloach, 2004; Ahmad, Liow, Spencer, and Jasieniuk, 2007). It can spread through fragmentation, rhizomes and layers (a mixture of asexual reproduction and growth) (Boland, 2006; Boose and Holt, 1998; Everitt, Yang, Alaniz, Davis, Nigling and Deloach, 2004; Ahmad, Liow, Spencer, and Jasieniuk, 2007). The plant can grow at a rate of 0.3-0.7 meters per week in optimal conditions (Purdue, 1958). Rhizomes can grow in clay, loamy and sandy soils which accounts for the wide range of habitats this species invades (Boose and Holt, 1998).</p>	
<p>Sources of information:</p>	

Ahmad, R., Liow, P.S., Spencer, D.F., and Jasieniuk, M. 2007. Molecular evidence for a single genetic clone of invasive *Arundo donax* in the United States. *Aquatic Botany*. 88:113-120.

Boland, J.M. 2006. The importance of layering in the rapid spread of *Arundo donax* (Giant Reed). *Madrono*. 53(4):301-312.

Boose, A.B. and Holt, J.S. 1998. Environmental effects on asexual reproduction in *Arundo donax*. *Weed Research*. 39:117-127.

Dudley, T.L. 2000. *Arundo donax*. In: Bossard C.C., Randall, J.M. and Hoshovsky M.C. (eds), *Invasive Plants of California's Wildlands*, 53:58. University of California Press, Berkeley.

Everitt, J.H., Yang, C., Alaniz, M.A., Davis, M.R., Nigling, F.L., and Deloach, C.J.. 2004. Canopy spectra of giant reed and associated vegetation. *Journal of Range Management*. 57 (5):561-56.

Perdue, R. E. Jr. 1958. *Arundo donax*- A source of musical reeds and industrial cellulose. *Economic Botany*. 12:368-404.

Question 2.5 Potential for human-caused dispersal

B Rev'd Sci. Pub'n [back](#)

Identify dispersal mechanisms: Human dispersal generally occurs through mechanical breakup and spreading within the site or transportation to new sites (Boland, 2006). Mechanical breakup occurs through tilling, bulldozers and other human disturbances. Fires caused by humans may cause spread within a site as the rhizomes of *A. donax* sprout quickly after a fire which allows it to rapidly dominate a cleared area and thereby outcompete native species that take longer to recuperate from fires (Everitt, Yang, Alaniz, Davis, Nigling and Deloach. 2004). Dispersal by humans also occurs as *A. donax* is used in many areas for erosion control, stream bank stabilization, fodder, roofing material, and as an ornamental (Dudley, 2000; Perdue, 1958). Following World War I, *A. donax* was introduced into Texas as a reed supply for musical instruments (Ahmad, Liow, Spencer, and Jasieniuk, 2007).

Sources of information: enter text here

Ahmad, R., Liow, P.S., Spencer, D.F., and Jasieniuk, M. 2007. Molecular evidence for a single genetic clone of invasive *Arundo donax* in the United States. *Aquatic Botany*. 88:113-120.

Boland, J.M. 2006. The importance of layering in the rapid spread of *Arundo donax* (Giant Reed). *Madrono*. 53(4):301-312.

Dudley, T.L. 2000. *Arundo donax*. In: Bossard C.C., Randall, J.M. and Hoshovsky M.C. (eds), *Invasive Plants of California's Wildlands*, 53:58. University of California Press, Berkeley.

Everitt, J.H., Yang, C., Alaniz, M.A., Davis, M.R., Nigling, F.L., and Deloach, C.J.. 2004. Canopy spectra of giant reed and associated vegetation. *Journal of Range Management*. 57 (5):561-56.

Question 2.6 Potential for natural long-distance dispersal

A Rev'd Sci. Pub'n [back](#)

Identify dispersal mechanisms: Dispersal generally occurs through flood event dispersal of fragments and vegetative propagules (Bell, 1997). It can also occur through fire, and human mechanical disturbances (Everitt, Yang, Alaniz, Davis, Nigling and Deloach. 2004; Boland, 2006).

Sources of information: enter text here

<p>Bell, G. 1997. Ecology and management of <i>Arundo donax</i>, and approaches to riparian habitat restoration in Southern California. In Brock, J. H., Wade, M., Pysek, P., and Green, D. (eds.): <i>Plant Invasions: Studies from North America and Europe</i>. Blackhuys Publishers, Leiden, The Netherlands, pp. 103-113.</p> <p>Boland, J.M. 2006. The importance of layering in the rapid spread of <i>Arundo donax</i> (Giant Reed). <i>Madrono</i>. 53(4):301-312.</p> <p>Everitt, J.H., Yang, C., Alaniz, M.A., Davis, M.R., Nigling, F.L., and Deloach, C.J. 2004. Canopy spectra of giant reed and associated vegetation. <i>Journal of Range Management</i>. 57 (5):561-56.</p>	
Question 2.7 Other regions invaded	D Rev'd Sci. Pub'n back
Identify other regions: <i>Arundo donax</i> has invaded all ecoregions of Texas.	
Sources of information: USDA PLANTS Database. http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=ARDO4 Accessed October 25, 2009.	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=ARDO4&cn=).	
USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=ARDO4).	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=ARDO4&cn=).	
USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=ARDO4).	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	No: 1 pts
Dense infestations produce >1,000 viable seed per square meter	Yes: 0 pts
Populations of this species produce seeds every year.	Yes: 0 pts
Seed production sustained over 3 or more months within a population annually	No: 0 pts
Seeds remain viable in soil for three or more years	No: 0 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	No: 0 pts
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Yes: 1 pts
Fragments easily and fragments can become established elsewhere	No: 2 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pts
	5 0
	B

Note any related traits:
Resprouts vigorously when cut, burned or grazed

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	B
		Chihuahuan Desert Grasslands	D
		Low Mountains and Bajadas	C
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	A
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbres	A
		Western Crosstimbres	A
		Grand Prairie	A
		Limestone Cut Plain	A
		Carbonate Cross Timbers	A
ER07	Edwards Plateau	Edwards Plateau Woodland	A
		Llano Uplift	A
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	A
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	A
		Southern Post Oak Savanna	A
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	A
		Southern Subhumid Gulf Coastal Prairies	A
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	A
		Lower Rio Grande Alluvial Floodplain	A
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes	B		
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	A
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Eichhornia crassipes
Synonyms:	Eichhornia speciosa, Piaropus crassipes
Common names:	Common water hyacinth
Evaluation date (mm/dd/yy):	07/08/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan.</p>

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	Rev'd Sci. Pub'n
1.2	Impact on plant community	A	Rev'd Sci. Pub'n
1.3	Impact on higher trophic levels	A	Rev'd Sci. Pub'n
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

AAAD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	A	Other Pub. Mat'l
2.2	Local rate of spread with no management	A	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	B	Rev'd Sci. Pub'n
2.4	Innate reproductive potential Wksht A	A	Rev'd Sci. Pub'n
2.5	Potential for human-caused dispersal	A	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
2.7	Other regions invaded	C	Other Pub. Mat'l

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

23

Use matrix to determine score and enter below:

A

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3.3

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Rev'd Sci. Pub'n back
Identify ecosystem processes impacted: Lowers light penetration and dissolved oxygen levels.	
Sources of information: enter text here Rommens, W., J Mae, N Dekeza, P Inghelbrecht, N Nhiwatiwa, E Holsters, F Ollevier, B Marshall, L Brendock. 2003. The impact of water hyacinth (Eichhornia crassipes) in a eutrophic suprotropical impoundment (Lake Chivero, Zimbabwe). I. Water quality. Archive Feur Hydrobiologie. 158(3): 373-388. The Quiet Invasion: A Guide to Invasive Plants of the Galveston Bay Area (www.galvbayinvasives.org). Lisa Gonzalez and Jeff DallaRosa. Houston Advanced Research Center, 2006. Richardson, B. 2004. Plant Assessment Form: Eichhornia crassipes. California Invasive Plant and Pest Council.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev'd Sci. Pub'n back
Identify type of impact or alteration: Water hyacinth mats degrade water quality by blocking photosynthesis, which greatly reduces oxygen levels in the water. This creates a cascading effect by reducing other underwater life such as fish and other plants. Water hyacinth also reduces biological diversity, impacts native submersed plants, alters immersed plant communities by pushing away and crushing them, and also alter animal communities by blocking access to the water and/or eliminating plants the animals depend on for shelter and nesting.	
Sources of information: enter text here The Quiet Invasion: A Guide to Invasive Plants of the Galveston Bay Area (www.galvbayinvasives.org). Lisa Gonzalez and Jeff DallaRosa. Houston Advanced Research Center, 2006. Richardson, B. 2004. Plant Assessment Form: Eichhornia crassipes. California Invasive Plant and Pest Council. Gowanloch JN. 1944. The econimc status of water-hyacinth in Louisiana. La. Conserv. 2:3-8 Penfound WT, Earle TT. 1948. The biology of the water hyacinth. Ecol. Monogr. 18:449-72.	
Question 1.3 Impact on higher trophic levels	A Rev'd Sci. Pub'n back
Identify type of impact or alteration: Water hyacinth mats degrade water quality by blocking photosynthesis, which greatly reduces oxygen levels in the water. This creates a cascading effect by reducing other underwater life such as fish and other plants. Water hyacinth also reduces biological diversity, impacts native submersed plants, alters immersed plant communities by pushing away and crushing them, and also alter animal communities by blocking access to the water and/or eliminating plants the animals depend on for shelter and nesting.	
Sources of information: enter text here Gowanloch JN. 1944. The econimc status of water-hyacinth in Louisiana. La. Conserv. 2:3-8 Penfound WT, Earle TT. 1948. The biology of the water hyacinth. Ecol. Monogr. 18:449-72. Rommens, W., J Mae, N Dekeza, P Inghelbrecht, N Nhiwatiwa, E Holsters, F Ollevier, B Marshall, L Brendock. 2003. The impact of water hyacinth (Eichhornia crassipes) in a eutrophic suprotropical impoundment (Lake Chivero, Zimbabwe). I. Water quality. Archive Feur Hydrobiologie. 158(3): 373-388. The Quiet Invasion: A Guide to Invasive Plants of the Galveston Bay Area (www.galvbayinvasives.org). Lisa	

Gonzalez and Jeff DallaRosa. Houston Advanced Research Center, 2006.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
No native species of Eichhornia in Texas.	
Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 7 July 2011: http://wildflower.org/plants/	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: enter text here	
Dams can create still water conducive to establishment. But no disturbance necessary.	
Sources of information: enter text here	
Richardson, B. 2004. Plant Assessment Form: Eichhornia crassipes. California Invasive Plant and Pest Council.	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: no information	
Infestations can be many, many acres in size; mats may double their size in as little as 6-18 days	
Sources of information: enter text here	
Mitchell DS. 1976. The growth and management of <i>Eichhornia crassipes</i> and <i>Salvinia</i> spp. in their native environment and in alien situations. <i>In</i> : Varshney CK, Rzoska J, editors, Aquatic weeds in Southeast Asia. The Hague: Dr. W. Junk b.v., Publishers. 396 pp.	
Question 2.3 Recent trend in total area infested within state	B Rev'd Sci. Pub'n back
Describe trend: no information	
This plant is listed as a Texas Noxious Weed, so cannot be sold. This has slowed the statewide spread significantly. The plant is still traded and spread to new bodies of water by boats and animals, so the spread is not at a stable level. Water hyacinth is also limited by temperature, so there are areas of the state where it would not survive.	
Sources of information: enter text here	
Kasselmann C. 1995. Aquarienpflanzen. Egen Ulmer GMBH & Co., Stuttgart. 472 pp. (In German)	
Observation: T. Gallo	
Question 2.4 Innate reproductive potential	A Rev. Sci. Mat'l back
Describe key reproductive characteristics:	
Refer to Worksheet A	
Sources of information:	
DiTomaso, JM, EA Healy. 2003. Aquatic and Riparian Weeds of the West. University of California Agriculture and Natural Resources publication 3421.	
Godfrey, K. 2000. Eichhornia crassipes. <i>In</i> : Invasive Plants of California's Wildlands. Bossard, CC., JM Randall, MC Hoshovsky (eds.) University of California Press, Berkeley: 171-175.	
Forno, IW, AD Wright. 1993. The biology of Australian weeds. 5. Eichhornia crassipes. The Journal of the Australian Institute of Agricultural Science (v/n unknown): 21-28.	

Richardson, B. 2004. Plant Assessment Form: <i>Eichhornia crassipes</i> . California Invasive Plant and Pest Council.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
This plant can be transported by fragments stuck to boats and boat trailers as well as other watercrafts. Although illegal to sell traffic or trade, the plant is still being traded via the internet throughout the state.	
Sources of information: enter text here	
Parker, MO. 2009. Don't Judge a Plant by its Petals. Texas Parks and Wildlife Magazine. http://forums.gardenweb.com/forums/load/txgard/exch0514280615203.html	
Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Fragments easily break off and are carried further away by flooding events. Seeds and fragments are also transported long distances by wading birds.	
Sources of information: enter text here	
Mitchell DS. 1976. The growth and management of <i>Eichhornia crassipes</i> and <i>Salvinia</i> spp. in their native environment and in alien situations. <i>In</i> : Varshney CK, Rzoska J, editors, Aquatic weeds in Southeast Asia. The Hague: Dr. W. Junk b.v., Publishers. 396 pp.	
Observation: T. Gallo	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: enter text here	
Has most likely invaded all ecoregions of Texas where it can survive.	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 7 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=EICR&cn=	
USDA PLANTS Database (Accessed 7 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=EICR)	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B.	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 7 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=EICR&cn=	
USDA PLANTS Database (Accessed 7 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=EICR)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	

Refer to Worksheet B.

Sources of information: enter text here

Invaders of Texas Citizen Science Observations (Accessed 7 July 2011:
<http://texasinvasives.org/observations/search.php?satellite=&sn=EICR&cn=>

USDA PLANTS Database (Accessed 7 July 2011:
http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=EICR)

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	2
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	2
Resprouts readily when cut, grazed, or burned	0
	11 0
	A

Note any related traits: enter text here

Seeds production can be sustained over 3 months in warmer environments of South Texas. This would be a "0" for northern regions, but still would keep the overall score at an "A"

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	
		Western Crosstimbers	
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	A
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	C
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	C
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	B
		Red River Bottomland	

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Hydrilla verticillata
Synonyms:	
Common names:	Hydrilla
Evaluation date (mm/dd/yy):	07/06/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	Rev'd Sci. Pub'n
1.2	Impact on plant community	A	Rev'd Sci. Pub'n
1.3	Impact on higher trophic levels	A	Rev'd Sci. Pub'n
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

AAAD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	A	Other Pub. Mat'l
2.2	Local rate of spread with no management	A	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	B	Other Pub. Mat'l
2.4	Innate reproductive potential Wksht A	A	Rev'd Sci. Pub'n
2.5	Potential for human-caused dispersal	A	Rev'd Sci. Pub'n
2.6	Potential for natural long-distance dispersal	A	Rev'd Sci. Pub'n
2.7	Other regions invaded	A	Observational

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

26

Use matrix to determine score and enter below:

A

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3.38

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Rev'd Sci. Pub'n back
Identify ecosystem processes impacted: Dense underwater stands of hydrilla raise water pH and temperature, and lower dissolved oxygen.	
Sources of information: enter text here Hydrilla. Technical Information about Hydrilla. 1999. Accessed: 06 July 11: http://www.ecy.wa.gov/programs/wq/plants/weeds/hydrilla.html . Langeland, K.A. 1996. Hydrilla verticillata (L.F.) Royle (Hydrocharitaceae), "The Perfect Aquatic Weed." Castanea 61:293-304. The Quiet Invasion: A Guide to Invasive Plants of the Galveston Bay Area. Lisa Gonzalez and Jeff DallaRosa. Houston Advanced Research Center, 2006.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev. Sci. Mat'l back
Identify type of impact or alteration: It will grow with less light and is more efficient at taking up nutrients than native species. Taken from California Invasive Plant and Pest Council: <i>Physical blockage displaces native aquatic vegetation by forming dense stands or large subsurface mats. Dense canopies can often shade out native vegetation. Hydrilla can grow at lower light intensities than many other plants, absorb carbon from water more efficiently than other plants and can continue to thrive during the summer when carbon can become limiting, store extra P, tolerant of a wide range of water conditions, will thrive in flowing and still water, and tolerate salinity of up to 10 ppt, encroaching upon outer limits of estuaries.</i>	
Sources of information: enter text here Hydrilla. Technical Information about Hydrilla. 1999. Accessed: 06 July 11: http://www.ecy.wa.gov/programs/wq/plants/weeds/hydrilla.html . Langeland, K.A. 1996. Hydrilla verticillata (L.F.) Royle (Hydrocharitaceae), "The Perfect Aquatic Weed." Castanea 61:293-304. The Quiet Invasion: A Guide to Invasive Plants of the Galveston Bay Area. Lisa Gonzalez and Jeff DallaRosa. Houston Advanced Research Center, 2006.	
Question 1.3 Impact on higher trophic levels	A Rev'd Sci. Pub'n back
Identify type of impact or alteration: While the opinion that hydrilla is beneficial for sportfish production is supported by certain research, other research suggests that largemouth bass are adversely affected when Hydrilla coverage exceeds 30%. While the number of fish is often increased, large fish become rarer.	
Sources of information: enter text here Langeland, K.A. 1996. Hydrilla verticillata (L.F.) Royle (Hydrocharitaceae), "The Perfect Aquatic Weed." Castanea 61:293-304. The Quiet Invasion: A Guide to Invasive Plants of the Galveston Bay Area. Lisa Gonzalez and Jeff DallaRosa. Houston Advanced Research Center, 2006.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here No known hybridization. No native Hydrilla species	

Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 6 July 2011: http://wildflower.org/plants/	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: enter text here	
No disturbance needed. Was introduced through aquarium trade and can be passed easily between water bodies on boats and trailers.	
Sources of information: enter text here	
Hydrilla. Technical Information about Hydrilla. 1999. Accessed: 06 July 11: http://www.ecy.wa.gov/programs/wq/plants/weeds/hydrilla.html .	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: no information	
Hydrilla was first discovered in Lake Austin in July 1999, when Texas Parks and Wildlife (TPWD) documented approximately 23 acres of the plants. By July 2000, growth had increased to 200 acres.	
Sources of information: enter text here	
Gilroy, M. 2011. Hydrilla. City of Austin Watershed Protection Department. Accessed 6 July 2011: http://www.ci.austin.tx.us/watershed/hydrilla_faqs.htm#done .	
Question 2.3 Recent trend in total area infested within state	B Other Pub. Mat'l back
Describe trend: no information	
Hydrilla is actively controlled in reservoirs and usually in publicly owned bodies of water therefore is not doubling in size every ten years. But without management Hydrilla could quickly spread into water bodies were it is not present.	
Sources of information: enter text here	
Gilroy, M. 2011. Hydrilla. City of Austin Watershed Protection Department. Accessed 6 July 2011: http://www.ci.austin.tx.us/watershed/hydrilla_faqs.htm#done .	
Question 2.4 Innate reproductive potential	A Rev'd Sci. Pub'n back
Describe key reproductive characteristics:	
Refer to Worksheet A.	
Sources of information:	
Hydrilla. Technical Information about Hydrilla. 1999. Accessed: 06 July 11: http://www.ecy.wa.gov/programs/wq/plants/weeds/hydrilla.html .	
Langeland, K.A. 1996. Hydrilla verticillata (L.F.) Royle (Hydrocharitaceae), "The Perfect Aquatic Weed." Castanea 61:293-304.	
The Quiet Invasion: A Guide to Invasive Plants of the Galveston Bay Area. Lisa Gonzalez and Jeff DallaRosa. Houston Advanced Research Center, 2006.	
Question 2.5 Potential for human-caused dispersal	A Rev. Sci. Mat'l back
Identify dispersal mechanisms: enter text here	
Hydrilla is easily and commonly spread by fragments on boats and boat trailers.	
Sources of information: enter text here	
Gilroy, M. 2011. Hydrilla. City of Austin Watershed Protection Department. Accessed 6 July 2011:	

<p>http://www.ci.austin.tx.us/watershed/hydrilla_faqs.htm#done.</p> <p>Hydrilla. Technical Information about Hydrilla. 1999. Accessed: 06 July 11: http://www.ecy.wa.gov/programs/wq/plants/weeds/hydrilla.html.</p> <p>Langeland, K.A. 1996. Hydrilla verticillata (L.F.) Royle (Hydrocharitaceae), "The Perfect Aquatic Weed." <i>Castanea</i> 61:293-304.</p> <p>The Quiet Invasion: A Guide to Invasive Plants of the Galveston Bay Area. Lisa Gonzalez and Jeff DallaRosa. Houston Advanced Research Center, 2006.</p>	
Question 2.6 Potential for natural long-distance dispersal	A Rev. Sci. Pub'n back
<p>Identify dispersal mechanisms: enter text here</p> <p>Hydrilla can grow by fragmentation or tubers that can both be broken off and carried long distances down waterways. Tubers can survive ingestion by water fowl. There is potential for seeds to be spread by waterfowl and other birds.</p>	
<p>Sources of information: enter text here</p> <p>Hydrilla. Technical Information about Hydrilla. 1999. Accessed: 06 July 11: http://www.ecy.wa.gov/programs/wq/plants/weeds/hydrilla.html.</p> <p>Langeland, K.A. 1996. Hydrilla verticillata (L.F.) Royle (Hydrocharitaceae), "The Perfect Aquatic Weed." <i>Castanea</i> 61:293-304.</p>	
Question 2.7 Other regions invaded	A Observational back
<p>Identify other regions: enter text here</p> <p>Hydrilla has the potential to grow in any waterway in Texas and has not invaded all of them. Therefore it is a great threat to waterways where it is not currently present.</p>	
<p>Sources of information: enter text here</p> <p>Observation: T. Gallo</p>	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
<p>Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here</p> <p>Refer to Worksheet B. Hydrilla is severely underreported in Texas.</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Observations (Accessed 8 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=HYVE3&cn=</p> <p>USDA PLANTS Database (Accessed 8 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=HYVE3)</p>	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
<p>Describe distribution: enter text here</p> <p>Refer to Worksheet B. Hydrilla is severely underreported in Texas.</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Observations (Accessed 8 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=HYVE3&cn=</p> <p>USDA PLANTS Database (Accessed 8 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=HYVE3)</p>	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

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HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	2
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Yes/No?
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	2
Resprouts readily when cut, grazed, or burned	1
	Total Pts
	Total Unknowns
	Score
Note any related traits: enter text here Hydrilla produces tubers more often than seeds, but can produce 5,000 per square meter. Therefore the seed reference is referring to tubers.	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crossttimbers	A
		Western Crossttimbers	
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	A
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Ligustrum lucidum
Synonyms:	
Common names:	Glossy privet
Evaluation date (mm/dd/yy):	4/15/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78739
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: enter text here</p> <p>This species was originally assessed for the City of Austin Invasive Species Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	C	4
1.2	Impact on plant community	A	4
1.3	Impact on higher trophic levels	A	3
1.4	Impact on genetic integrity	U	No Information

Impact

Enter four characters from Q1.1-1.4 below:

CAAU

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	A	4
2.2	Local rate of spread with no management	A	3
2.3	Recent trend in total area infested within state	B	2
2.4	Innate reproductive potential Wksht A	A	4
2.5	Potential for human-caused dispersal	A	3
2.6	Potential for natural long-distance dispersal	A	4
2.7	Other regions invaded	B	4

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

19

Use matrix to determine score and enter below:

A

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	3
3.2	Distribution/Peak frequency Wksht C	A	3

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3.41

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	C Rev'd Sci. Pub'n back
Identify ecosystem processes impacted: Leaves of a similar species, <i>L. sinense</i> , have been reported to impact on aquatic macro invertebrates through chemicals released. The species does occur in riparian areas, and could have some impact on water quality by changing light levels and nutrient imputes. There has been however no quantifiable reports of this species impacting upon water quality.	
Sources of information: Llewellyn DC (2005) Effect of toxic riparian weeds on the survival of aquatic invertebrates. <i>Australian Zoologist</i> 33 , 194-209.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev'd Sci. Pub'n back
Identify type of impact or alteration: Glossy privet forms large, almost single-species stands that have become one of the main vegetation cover types in Argentina. Has invaded most southern forest creating a monoculture and eliminating understory growth. In Texas stands of <i>L. lucidum</i> can dominate (>75%) (Gallo, observational)	
Sources of information: Gallo, observational Hoyos, L., G. I. Gavier Pizarro, T. Kuemmerle, E. H. Bucher, V. C. Radeloff, and P. Tecco. 2010. Invasion of glossy privet (<i>Ligustrum lucidum</i>) and native forest loss in the Sierra Chicas of Córdoba, Argentina. <i>Biological Invasions</i> 12:3261–3275. Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p. Muyt A. 2001. <i>Bush Invaders of South-East Australia</i> . R.G & F.J.Richardson, Meredith.	
Question 1.3 Impact on higher trophic levels	A Other Pub. Mat'l back
Identify type of impact or alteration: Invasion in and reduction in nesting and foraging sites, cover, and other critical resources (i.e., native species habitat) for the endangered Golden-cheeked warbler in central Texas (source). Introduced urban landscape plants such as privets (<i>Ligustrum</i> spp) have invaded limestone canyons of Comal, Hays, Travis and Williamson counties in central Texas. These introduced plants invade rich, diverse slope woodlands, blocking sunlight from reaching the floor and outcompeting native species, such as bracted twistflower.	
Sources of information: Poole, J.M, W.R. Carr, D.M. Price, J.R. Singhurst. 2008. <i>Rare Plants of Texas: A Field Guide</i> . Texas A&M University Press.	

Question 1.4 Impact on genetic integrity	U No Information back
Identify impacts: No known hybridization with native species	
Sources of information: Observational, Gallo	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Rev'd Sci. Pub'n back
Describe role of disturbance: Ligustrum lucidum can establish in lowland and upland forest without any disturbance.	
Sources of information: enter text here Gurvich, D.E., P.A. Tecco, and S. Diaz. 2005. Plant invasions in undisturbed ecosystems: The triggering attribute approach. Journal of Vegetation Science 16:6. Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p.	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: Spreads very rapidly. In central Texas, L. lucidum can double in <10 years with no management.	
Sources of information: Marjan Kluepfel, HGIC Information Specialist, and Bob Polomski, Extension Consumer Horticulturist, Clemson University. Observational, Gallo	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: Local infestations are increasing, but L. lucidum seems to have invaded every ecoregion it can.	
Sources of information: Observational, Gallo	
Question 2.4 Innate reproductive potential	A Rev'd Sci. Pub'n back
Describe key reproductive characteristics: Reaches maturity level in 4 years (Swarbick, 1999) [0 points], produces approx. 6900 seeds per stem (Panetta, 2000). Large trees have been reported to be capable of producing more than a million seeds a year (Swarbick, 1999) [2 points], produces seeds every year (Panetta, 2000) [1 point], seed production sustained over 3 months (Swarbick, 1999) [1 point], seeds remain viable less than 1 year (Swarbick, 1999) [0 points], unknown if cross pollinate and self-pollinate [0 points] (Swarbick, 1999). Has quick spreading roots[1 point], does not easily fragment and establish elsewhere[0 points], but does resprout readily when cut, burned, or grazed [1 point] (Miller, 2003). Total 6 points.	
Sources of information: Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research	

Station. 93 p.	
Panetta, F.D. 2000. Fates of fruits and seeds of <i>Ligustrum lucidum</i> W.T.Ait. and <i>L. sinense</i> Lour. maintained under natural rainfall or irrigation. Australian Journal of Botany 48 (6): 701-705.	
Swarbrick, J. T., Timmins, S. M. and Bullen, K. 1999. The biology of Australian weeds. 36. <i>Ligustrum lucidum</i> Aiton and <i>Ligustrum sinense</i> Lour. <i>Plant Protection Quarterly</i> , 14 4: 122-130.	
Westoby, M.; Dalby, J.; Adams-Acton, L. 1983. Fruit production by two species of privet, <i>Ligustrum sinense</i> Lour. and <i>L. lucidum</i> W.T. Ait., in Sydney. Australian Weeds, 2 4: 127-129.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Commonly planted as ornamental and sold in nursery trade. Promoted for windbreaks and drought tolerant landscaping.	
Sources of information: enter text here	
Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p.	
Welch, W.C. LANDSCAPING FOR ENERGY CONSERVATION. Texas Agricultural Extension Service. Accessed 19 April 2011: http://aggie-horticulture.tamu.edu/extension/homelandscape/energy/energy.html	
Question 2.6 Potential for natural long-distance dispersal	A Rev'd Sci. Pub'n back
Identify dispersal mechanisms: Berries are readily eaten by birds	
Sources of information: enter text here	
Ferreras, A.E. and L. Galetto. 2008. Fruit removal of an invasive exotic species (<i>Ligustrum lucidum</i>) in a fragmented landscape. <i>Journal of Arid Environments</i> 72 (9): 1573-1580	
Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p.	
Muyt A. 2001. <i>Bush Invaders of South-East Australia</i> . R.G & F.J.Richardson, Meredith.	
Australian/New Zealand Weed Risk Assessment adapted for Hawai'i. Research directed by C. Daehler (UH Botany) with funding from the Kaulunani Urban Forestry Program and US Forest Service.	
Question 2.7 Other regions invaded	B Rev'd Sci. Pub'n back
Identify other regions: Is known to invade montane dry forest in Argentina similar to Texas montane region.	
Sources of information:	
Ferreras, A.E. and L. Galetto. 2008. Fruit removal of an invasive exotic species (<i>Ligustrum lucidum</i>) in a fragmented landscape. <i>Journal of Arid Environments</i> 72 (9): 1573-1580	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to	

<p>the state, if known: enter text here</p> <p>Refer to Worksheet B</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=LILU2&cn=).</p> <p>USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=LILU2).</p>	
<p>Question 3.2 Distribution/Peak frequency</p>	<p>A Other Pub. Mat'l back</p>
<p>Describe distribution: enter text here</p> <p>Refer to Worksheet B</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=LILU2&cn=).</p> <p>USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=LILU2).</p>	
<p>References</p> <p>List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). Websites should include the name of the organization and the date accessed. Personal communications should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.</p> <p>Examples:</p> <p>Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. Weed Technology. 9: 402-404.</p> <p>HEAR. Date unknown. Emex spinosa. Hawaiian Ecosystems at Risk. www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009</p> <p>DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.</p>	
<p>enter text here</p>	

Worksheet A

Reaches reproductive maturity in 2 years or less	No
Dense infestations produce >1,000 viable seed per square meter	Yes
Populations of this species produce seeds every year.	Yes
Seed production sustained over 3 or more months within a population annually	Yes
Seeds remain viable in soil for three or more years	No
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Unknown
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Yes
Fragments easily and fragments can become established elsewhere	No
Resprouts readily when cut, grazed, or burned	Yes
	6 1
	6
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crossttimbers	A
		Western Crossttimbers	
		Grand Prairie	A
		Limestone Cut Plain	A
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	A
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	C
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	B
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	A
		Flatwoods	A

| | Red River Bottomland | |

Ecoregions of Texas

- | | | |
|--|---|---|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands
24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
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25 High Plains
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25j Shinnery Sands
25k Arid Llano Estacado | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks
27 Central Great Plains
27h Red Prairie
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27j Limestone Plains
29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
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29f Carbonate Cross Timbers | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau
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31a Northern Nueces Alluvial Plains
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31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
|--|---|---|



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Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
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Table 1. Species and Evaluator Information

Species name (Latin binomial):	Melia azedarach L.
Synonyms:	Melia azedarach L. var. umbraculifera Knox
Common names:	Chinaberry
Evaluation date (mm/dd/yy):	06/20/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	Other Pub. Mat'l
1.2	Impact on plant community	A	Other Pub. Mat'l
1.3	Impact on higher trophic levels	C	Other Pub. Mat'l
1.4	Impact on genetic integrity	D	No Information

Impact

Enter four characters from Q1.1-1.4 below:

AACD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	B	Other Pub. Mat'l
2.2	Local rate of spread with no management	A	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	C	Other Pub. Mat'l
2.4	Innate reproductive potential Wksht A	A	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A	Observational
2.6	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
2.7	Other regions invaded	C	Other Pub. Mat'l

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

16

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.69

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Other Pub. Mat'l back
Identify ecosystem processes impacted:	
Chinaberry reduces light availability to lower understory plants. It is also known to be allelopathic. Its leaf litter can increase the pH of soils and add nitrogen, significantly altering soil chemistry.	
Sources of information: enter text here	
National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG). 2008. Global Invasive Species Database: <i>Melia azedarach</i> . Accessed 22 June 2011: http://www.issg.org/database/species/impact_info.asp?si=636&fr=1&sts=sss&lang=EN .	
Waggy, Melissa, A. 2009. <i>Melia azedarach</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, June 22].	
Question 1.2 Impact on plant community composition, structure, and interactions	A Other Pub. Mat'l back
Identify type of impact or alteration:	
Creates monocultures and outcompetes native vegetation. Stands can dominate >75% of the vegetation in the area.	
Sources of information: enter text here	
National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG). 2008. Global Invasive Species Database: <i>Melia azedarach</i> . Accessed 22 June 2011: http://www.issg.org/database/species/impact_info.asp?si=636&fr=1&sts=sss&lang=EN .	
Waggy, Melissa, A. 2009. <i>Melia azedarach</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, June 22].	
Question 1.3 Impact on higher trophic levels	C Other Pub. Mat'l back
Identify type of impact or alteration:	
Birds and mammals can become intoxicated or poisoned by old berries. Reduces overall biodiversity.	
Sources of information: enter text here	
USDA Forest Service, Southern Region, National Forests in Florida, September 2000, Protection Report R8-PR 50.	
Question 1.4 Impact on genetic integrity	D No Information back
Identify impacts: enter text here	
No known hybridization with native flora.	
Sources of information: enter text here	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Other Pub. Mat'l back
Describe role of disturbance: enter text here	
Usual invades disturbed areas but is able to invade undisturbed landscapes.	
Sources of information: enter text here	

<p>National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG). 2008. Global Invasive Species Database: <i>Melia azedarach</i>. Accessed 22 June 2011: http://www.issg.org/database/species/impact_info.asp?si=636&fr=1&sts=sss&lang=EN.</p> <p>Waggy, Melissa, A. 2009. <i>Melia azedarach</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, June 22].</p>	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
<p>Describe rate of spread: no information</p> <p>Chinaberry is drought and pest tolerant and can spread at a rate of greater than doubling every 10 years.</p>	
<p>Sources of information: enter text here</p> <p>Gilman, E.F. and D.G. Watson. 2009. <i>Melia azedarach</i>: Chinaberry. Florida A. & M. University Cooperative Extension Program, Publication #ENH-565.</p> <p>Waggy, Melissa, A. 2009. <i>Melia azedarach</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, June 22].</p> <p>Observational: T. Gallo</p>	
Question 2.3 Recent trend in total area infested within state	C Other Pub. Mat'l back
<p>Describe trend: no information</p> <p>Most areas in the state are probably invaded and therefore is stable.</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 21 June 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=MEAZ&cn=).</p> <p>Observational: T. Gallo</p>	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
<p>Describe key reproductive characteristics:</p> <p>Refer to Worksheet A</p>	
<p>Sources of information:</p> <p>Waggy, Melissa, A. 2009. <i>Melia azedarach</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, June 22].</p>	
Question 2.5 Potential for human-caused dispersal	A Observational back
<p>Identify dispersal mechanisms: enter text here</p> <p>Berries drop on train cars and transported long distances down railroad right of ways. Berries land on vehicles and can be transported in the beds of trucks and other automobiles. Still sold in the nursery industry, but not as common as in the past.</p>	
<p>Sources of information: enter text here</p> <p>Observational: T. Gallo, 2011.</p>	
Question 2.6 Potential for natural long-distance dispersal	A Rev'd, Sci. Pub'n. back
<p>Identify dispersal mechanisms: enter text here</p> <p>Birds and mammals eat the seeds. The seeds can be dispersed long distances by water.</p>	
<p>Sources of information: enter text here</p> <p>Waggy, Melissa, A. 2009. <i>Melia azedarach</i>. In: Fire Effects Information System, [Online]. U.S. Department of</p>	

<p>Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, June 22].</p> <p>Voigt, F, N. Farwig and S.D.Johnson. 2011. Interactions between the invasive tree <i>Melia azedarach</i> (Meliaceae) and native frugivores in South Africa. <i>Journal of Tropical Ecology</i> 27:355–363.</p>	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
<p>Identify other regions: enter text here</p> <p>Most regions invaded in Texas</p>	
<p>Sources of information: enter text here</p> <p>Waggy, Melissa, A. 2009. <i>Melia azedarach</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, June 22].</p>	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
<p>Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here</p> <p>Refer to Worksheet B</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 21 June 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=MEAZ&cn=).</p> <p>USDA PLANTS Database (Accessed 21 June 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=MEAZ).</p>	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
<p>Describe distribution: enter text here</p> <p>Refer to Worksheet B</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 21 June 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=MEAZ&cn=).</p> <p>USDA PLANTS Database (Accessed 21 June 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=MEAZ).</p>	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	0
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	1
	7 0
	A

Note any related traits: enter text here

Within 2 years, trees produced from root sprouts accumulated more than 200 times the biomass of trees.

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	A
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	C
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	A
		Western Crosstimbers	
		Grand Prairie	A
		Limestone Cut Plain	A
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	A
		Llano Uplift	A
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	A
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	A
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	A
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	A
		Southern Subhumid Gulf Coastal Prairies	A
		Floodplains and Low Terraces	A
		Coastal Sand Plain	
		Lower Rio Grande Valley	A
		Lower Rio Grande Alluvial Floodplain	A
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
		Laguna Madre Barrier Islands and Coastal Marshes	A
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	A
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	A
		Flatwoods	C
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Phyllostachys aurea
Synonyms:	
Common names:	Golden Bamboo
Evaluation date (mm/dd/yy):	05/11/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	C	1
1.2	Impact on plant community	A	3
1.3	Impact on higher trophic levels	A	2
1.4	Impact on genetic integrity	D	3

Impact

Enter four characters from Q1.1-1.4 below:

CAAD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	A	3
2.2	Local rate of spread with no management	A	3
2.3	Recent trend in total area infested within state	U	2
2.4	Innate reproductive potential Wksht A	A	4
2.5	Potential for human-caused dispersal	A	3
2.6	Potential for natural long-distance dispersal	C	3
2.7	Other regions invaded	B	3

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

15

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	3
3.2	Distribution/Peak frequency Wksht C	A	3

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.61

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	C Anecdotal back
Identify ecosystem processes impacted: For streams, bamboo leaf litter alters stream food webs starting with litter-feeding stream invertebrates.	
Sources of information: enter text here	
Question 1.2 Impact on plant community composition, structure, and interactions	A Other Pub. Mat'l back
Identify type of impact or alteration: Creates a monoculture in secondary forest greatly reducing biodiversity of native plants. Stands can dominate up to 100% by this species.	
Sources of information: enter text here Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p. Swearingen, J., K. Reshetiloff, B. Slattery, and S. Zwicker. 2002. Plant Invaders of Mid-Atlantic Natural Areas. National Park Service and U.S. Fish & Wildlife Service, 82 pp. Center for Invasive Species and Ecosystem Health. 2010. Phyllostachys aurea. Accessed 11 May 2011: http://www.invasive.org/browse/subinfo.cfm?sub=3063#ref . Observational, Gallo.	
Question 1.3 Impact on higher trophic levels	A Observational back
Identify type of impact or alteration: In central TX bamboo is invading into the endangered golden-cheeked warbler habitat, and in East TX it invades in potential habitat for the Red Cockaded Woodpecker. In general it creates a monoculture and reduces the biodiversity of food sources, nesting sites, and foraging sites.	
Sources of information: enter text here Invaders of Texas Citizen Science Program (Accessed 11 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PHAU8&cn=). Observational, Gallo, Waitt, Billings, Pase.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: No known hybridization in TX	
Sources of information: enter text here Waitt, D. 2010. Native Plant Information Network. The Lady Bird Johnson Wildflower Center at the University of Texas at Austin. Accessed 11 May 2011: http://www.wildflower.org/explore/ .	

Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: enter text here	
Bamboo infestations increase with disturbance, and usually start from a point source introduction. But can quickly invade from point of introduction into undisturbed forests.	
Sources of information: enter text here	
Gucker, Corey L. 2009. <i>Phyllostachys aurea</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, May 11].	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: With no management stands can more than double every 10 years.	
Sources of information: enter text here	
Gucker, Corey L. 2009. <i>Phyllostachys aurea</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, May 11].	
Observational, Waitt, Billings, Pase, Gallo	
Question 2.3 Recent trend in total area infested within state	U Observational back
Describe trend: no information	
Golden bamboo is spreading rapidly from point source introductions and is being used often in new places as a landscape screening. Citizen scientists have recorded in in several new counties, but the infestation could have very well been there. It could very well be doubling in total area infested every 10 years, but not enough evidence to support this claim.	
Sources of information: enter text here	
Observational, Gallo	
Invaders of Texas Citizen Science Program (Accessed 11 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PHAU8&cn=).	
Question 2.4 Innate reproductive potential	A Rev'd, Sci. Pub'n back
Describe key reproductive characteristics:	
Refer to Worksheet A	
Sources of information:	
Diggs, George M., Jr.; Lipscomb, Barney L.; O'Kennon, Robert J. 1999. Illustrated flora of north-central Texas. Sida Botanical Miscellany, No. 16. Fort Worth, TX: Botanical Research Institute of Texas. 1626 p.	
Canadian Museum of Nature. 1998. Portrait of biodiversity--Bamboo: <i>Phyllostachys aurea</i> . Global Biodiversity. Ottawa: Canadian Museum of Nature. 7(4): 18.	
Janzen, Daniel H. 1976. Why bamboos wait so long to flower. Annual Review of Ecology and Systematics. 7: 347-391.	
Gucker, Corey L. 2009. <i>Phyllostachys aurea</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, May 11].	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Golden bamboo is promoted and commonly sold throughout Texas and the US. Fragments can also be spread	

through yard waste.	
Sources of information: enter text here	
<p>Gucker, Corey L. 2009. <i>Phyllostachys aurea</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, May 11].</p> <p>Langeland, K.A., H.M. Cherry, et al. 2008. Identification and Biology of Nonnative Plants in Florida's Natural Areas – Second Edition. University of Florida-IFAS Pub SP 257.</p> <p>Arnold, M. 2008. Landscape Plants For Texas And Environ, Third Edition. Texas A&M Press.</p>	
Question 2.6 Potential for natural long-distance dispersal	C Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Sources of information: Gucker, Corey L. 2009. <i>Phyllostachys aurea</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, May 11].	
Question 2.7 Other regions invaded	B Other Pub. Mat'l back
Identify other regions: enter text here	
<p>In China, golden bamboo grows in deciduous and coniferous forests, which are common habitats in the Eastern Texas, but have already been invaded. Although rare in southwestern Louisiana, golden bamboo is reported in prairies and pine woodlands, which have not been invaded in Texas . On the Cumberland Island National Seashore in Camden County, Georgia, golden bamboo is spreading vegetatively from roadsides into hammock/pine-oak (<i>Pinus-Quercus</i>) forests. In South Carolina, golden bamboo occurs in Coastal Plain, which is similar to our coastal prairies.</p>	
Sources of information: enter text here	
<p>Gucker, Corey L. 2009. <i>Phyllostachys aurea</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, May 11].</p>	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
<p>Invaders of Texas Citizen Science Program (Accessed 12 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PHAU8&cn=)</p> <p>USDA PLANTS Database: Accessed 12 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=PHAU8</p>	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B	

Sources of information: enter text here

Invaders of Texas Citizen Science Program (Accessed 12 May 2011:
<http://texasinvasives.org/observations/search.php?satellite=&sn=PHAU8&cn=>)

USDA PLANTS Database: Accessed 12 May 2011:
http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=PHAU8

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	0
Populations of this species produce seeds every year.	0
Seed production sustained over 3 or more months within a population annually	0
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	2
Resprouts readily when cut, grazed, or burned	1
	6pts 0
	A

Note any related traits:

A single golden bamboo clump can produce up to 9.3 miles (15 km) of stems in its lifetime.

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbres	A
		Western Crosstimbres	A
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	A
		Llano Uplift	A
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	A
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	C
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	C
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes	C		
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	A
		Flatwoods	A
		Red River Bottomland	

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Pueraria montana var. lobata
Synonyms:	Glycine javanica, Pueraria lobata, Pueraria thunbergiana
Common names:	Kudzu
Evaluation date (mm/dd/yy):	07/12/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Originally assessed for the City of Austin Invasive Management Plan

Due to its limited distribution in Austin and its potential to survive, this should probably be an “Alert” species locally for the City of Austin.

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	Rev'd Sci. Pub'n
1.2	Impact on plant community	A	Rev'd Sci. Pub'n
1.3	Impact on higher trophic levels	A	Rev'd Sci. Pub'n
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

AAAD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	A	Other Pub. Mat'l
2.2	Local rate of spread with no management	A	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	B	Observational
2.4	Innate reproductive potential Wksht A	A	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	C	Observational
2.6	Potential for natural long-distance dispersal	U	No Information
2.7	Other regions invaded	A	Other Pub. Mat'l

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

15

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.8

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Rev'd Sci. Pub'n back
Identify ecosystem processes impacted:	
<p>Extensive stands of <i>P. montana</i> may have detrimental effects on regional air quality. Many temperate tree and shrub species emit photochemically reactive hydrocarbons, such as isoprene, into the surrounding air. Isoprene affects tropospheric chemistry by forming ozone and smog when nitrogen oxides are present. At high nitrogen oxide levels, isoprene breakdown leads to the formation of peroxyacetyl nitrate (PAN) and methyl peroxyacetyl nitrate (MPAN) (Sharkey and Yeh, 2001).</p>	
Sources of information: enter text here	
<p>Benjamin, M. T., Sudol, M., Bloch, L., and Winer, A. M. 1996. Low-emitting urban forests: a taxonomic methodology for assigning isoprene and monoterpene emission rates. <i>Atmos. Environ.</i> 30: 1437–1452.</p> <p>Baldocchi, D., Guenther, A., Harley, P., Klinger, L., Zimmerman, P., Lamb, B., and Westberg, H. 1995. The fluxes and air chemistry of isoprene above a deciduous hardwood forest. <i>Philos. Trans. Roy. Soc. London Series a—Math. Phys. Eng. Sci.</i> 351: 279–296.</p> <p>Sharkey, T. D. 1996. Isoprene synthesis by plants and animals. <i>Endeavour</i> 20: 74–78.</p> <p>Irwin N. Forseth & Anne F. Innis (2004): Kudzu (<i>Pueraria montana</i>): History, Physiology, and Ecology Combine to Make a Major Ecosystem Threat, <i>Critical Reviews in Plant Sciences</i>, 23:5, 401-413.</p>	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev'd Sci. Pub'n back
Identify type of impact or alteration:	
<p>Kudzu kills or degrades other plants by smothering them under a solid blanket of leaves, by girdling woody stems and tree trunks, and by breaking branches or uprooting entire trees and shrubs through the sheer force of its weight. Munger (2002) states that no successional changes have been reported for population patches of <i>P. montana</i>. This indicates that local extinctions of native species and the arrest of natural community successional processes may be a long-term phenomenon.</p>	
Sources of information: enter text here	
<p>Weed of the Week: Kudzu. USDA Forest Service, Forest Health Staff, Newtown Square, PA. #WOW 10-12-04</p> <p>Irwin N. Forseth & Anne F. Innis (2004): Kudzu (<i>Pueraria montana</i>): History, Physiology, and Ecology Combine to Make a Major Ecosystem Threat, <i>Critical Reviews in Plant Sciences</i>, 23:5, 401-413.</p> <p>Munger, Gregory T. 2002. <i>Pueraria montana</i> var. <i>lobata</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 12].</p>	
Question 1.3 Impact on higher trophic levels	A Rev'd Sci. Pub'n back
Identify type of impact or alteration:	
<p>Kudzu may have a disproportionate effect on animals with specific mutualisms or feeding relationships with trees or shrubs suppressed by its growth. In areas with a high level of endemism and regional diversity could be permanently endangered by the spread of <i>P. montana</i>.</p>	
Sources of information: enter text here	
<p>Irwin N. Forseth & Anne F. Innis (2004): Kudzu (<i>Pueraria montana</i>): History, Physiology, and Ecology Combine to Make a Major Ecosystem Threat, <i>Critical Reviews in Plant Sciences</i>, 23:5, 401-413.</p>	

Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
No native related species.	
Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 6 July 2011: http://wildflower.org/plants/	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: enter text here	
Core areas of otherwise undisturbed, insular forest habitat can eventually succumb, as invading kudzu slowly advances from established populations along a forest perimeter.	
Sources of information: enter text here	
Munger, Gregory T. 2002. Pueraria montana var. lobata. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 12].	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: no information	
Once established, Kudzu plants grow rapidly, extending as much as 60 feet per season at a rate of about one foot per day. This vigorous vine may extend 32-100 feet in length, with stems 1/2 - 4 inches in diameter.	
Sources of information: enter text here	
Weed of the Week: Kudzu. USDA Forest Service, Forest Health Staff, Newtown Square, PA. #WOW 10-12-04	
Munger, Gregory T. 2002. Pueraria montana var. lobata. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 12].	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: no information	
Kudzu is watched closely, therefore the spread is managed. Although if unmanaged it could spread quickly. Major spread is in East Texas Pineywoods.	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
Describe key reproductive characteristics:	
Refer to Worksheet A.	
Sources of information:	
Everest, John W.; Miller, James H.; Ball, Donald M.; Patterson, Michael G. 1991. Kudzu in Alabama: History, uses, and control, [Online]. Available: http://aces.edu/departmen/ipm/kudzu.htm [12 July 2011]. [41048].	
Brendenkamp, Christy; Beer, Brian. 2001. Controlling kudzu in western North Carolina, [Online]. Available: http://swain.ces.state.nc.us/newsletters/nursery/kudzu.html [2002, May 7]. [41050].	
Munger, Gregory T. 2002. Pueraria montana var. lobata. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 12].	

Question 2.5 Potential for human-caused dispersal	C Observational back
Identify dispersal mechanisms: enter text here	
Kudzu is listed as a noxious weed in Texas therefore it is illegal to sell traffic and trade throughout the state. Although you can still order it over the internet and some garden groups may trade plants.	
Sources of information: enter text here	
Question 2.6 Potential for natural long-distance dispersal	B No Information back
Identify dispersal mechanisms: enter text here	
Kudzu does produce minimal seeds that could be eaten by birds and mammals. However, there is no information in the literature. Kudzu does grow quickly and a long distance then reroots to make a new plant that can grow quickly and far distances. This vigorous growth may extend 32-100 feet in length	
Sources of information: enter text here	
Question 2.7 Other regions invaded	A Other Pub. Mat'l back
Identify other regions: enter text here	
Kudzu has infested ecotypes similar to our Rolling Plains, High Plains, Post Oak Savanahas, Juniper/Oak Woodlands, Coastal Prairies, and uninfested riparian areas.	
Sources of information: enter text here	
Munger, Gregory T. 2002. Pueraria montana var. lobata. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 12].	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B.	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 12 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PUMOL&cn=	
USDA PLANTS Database (Accessed 12 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=PUMOL)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B.	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 12 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PUMOL&cn=	
USDA PLANTS Database (Accessed 12 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=PUMOL)	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	0
Dense infestations produce >1,000 viable seed per square meter	0
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	Unknown
Seeds remain viable in soil for three or more years	1
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Unknown
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	2
Resprouts readily when cut, grazed, or burned	1
	6 2
	A
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

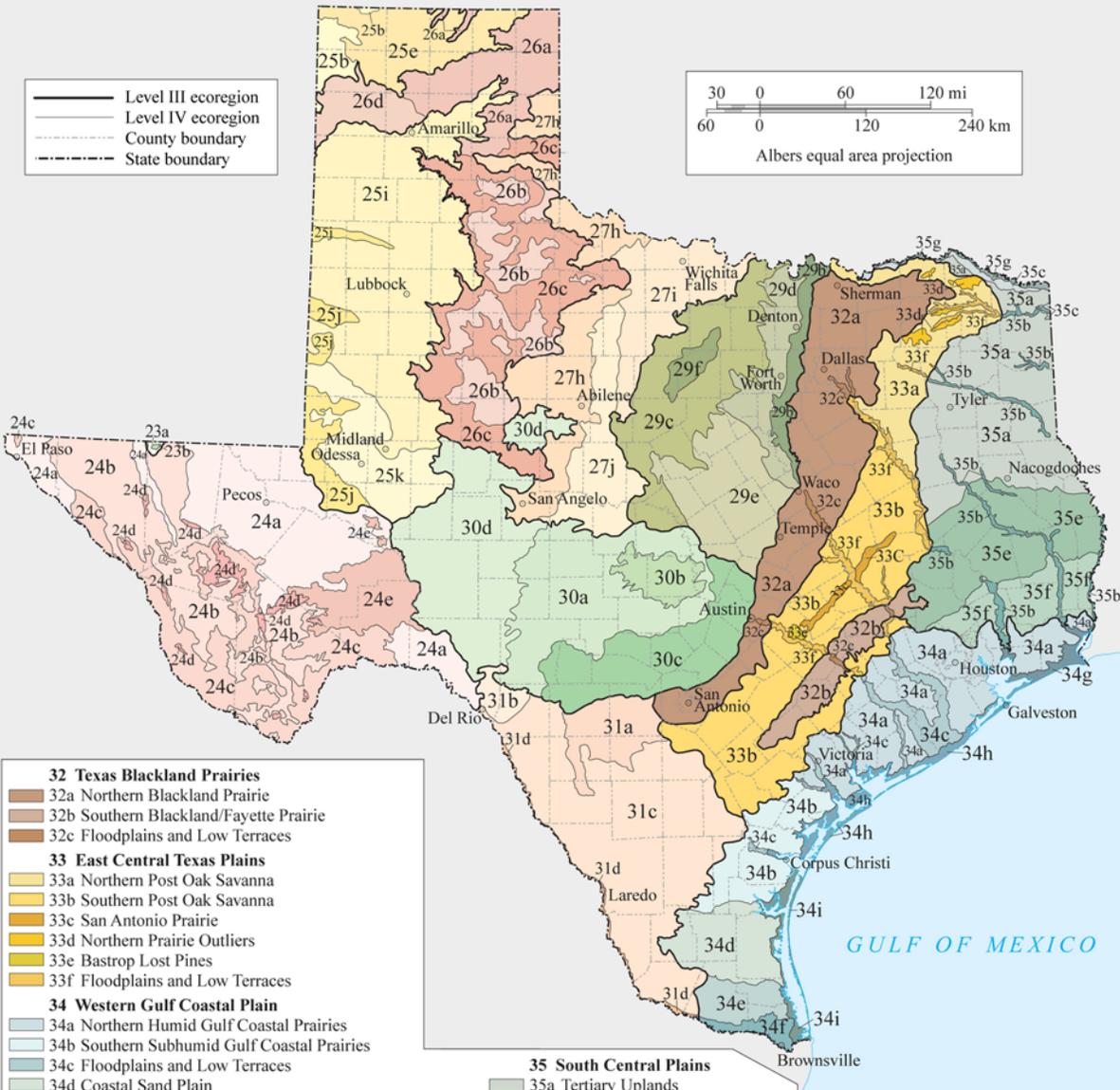
Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbres	
		Western Crosstimbres	
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	C
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	C
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	A
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|--|---|--|
| <p>23 Arizona/New Mexico Mountains</p> <ul style="list-style-type: none"> 23a Chihuahuan Desert Slopes 23b Montane Woodlands <p>24 Chihuahuan Deserts</p> <ul style="list-style-type: none"> 24a Chihuahuan Basins and Playas 24b Chihuahuan Desert Grasslands 24c Low Mountains and Bajadas 24d Chihuahuan Montane Woodlands 24e Stockton Plateau <p>25 High Plains</p> <ul style="list-style-type: none"> 25b Rolling Sand Plains 25e Canadian/Cimarron High Plains 25i Llano Estacado 25j Shinnery Sands 25k Arid Llano Estacado | <p>26 Southwestern Tablelands</p> <ul style="list-style-type: none"> 26a Canadian/Cimarron Breaks 26b Flat Tablelands and Valleys 26c Caprock Canyons, Badlands, and Breaks 26d Semiarid Canadian Breaks <p>27 Central Great Plains</p> <ul style="list-style-type: none"> 27h Red Prairie 27i Broken Red Plains 27j Limestone Plains <p>29 Cross Timbers</p> <ul style="list-style-type: none"> 29b Eastern Cross Timbers 29c Western Cross Timbers 29d Grand Prairie 29e Limestone Cut Plain 29f Carbonate Cross Timbers | <p>30 Edwards Plateau</p> <ul style="list-style-type: none"> 30a Edwards Plateau Woodland 30b Llano Uplift 30c Balcones Canyonlands 30d Semiarid Edwards Plateau <p>31 Southern Texas Plains</p> <ul style="list-style-type: none"> 31a Northern Nueces Alluvial Plains 31b Semiarid Edwards Bajada 31c Texas-Tamaulipan Thornscrub 31d Rio Grande Floodplain and Terraces |
|--|---|--|



- Level III ecoregion
- Level IV ecoregion
- - - County boundary
- - - State boundary

- 32 Texas Blackland Prairies**
- 32a Northern Blackland Prairie
 - 32b Southern Blackland/Fayette Prairie
 - 32c Floodplains and Low Terraces
- 33 East Central Texas Plains**
- 33a Northern Post Oak Savanna
 - 33b Southern Post Oak Savanna
 - 33c San Antonio Prairie
 - 33d Northern Prairie Outliers
 - 33e Bastrop Lost Pines
 - 33f Floodplains and Low Terraces
- 34 Western Gulf Coastal Plain**
- 34a Northern Humid Gulf Coastal Prairies
 - 34b Southern Subhumid Gulf Coastal Prairies
 - 34c Floodplains and Low Terraces
 - 34d Coastal Sand Plain
 - 34e Lower Rio Grande Valley
 - 34f Lower Rio Grande Alluvial Floodplain
 - 34g Texas-Louisiana Coastal Marshes
 - 34h Mid-Coast Barrier Islands and Coastal Marshes
 - 34i Laguna Madre Barrier Islands and Coastal Marshes

- 35 South Central Plains**
- 35a Tertiary Uplands
 - 35b Floodplains and Low Terraces
 - 35c Pleistocene Fluvial Terraces
 - 35e Southern Tertiary Uplands
 - 35f Flatwoods
 - 35g Red River Bottomlands

Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Rapistrum rugosum
Synonyms:	
Common names:	Annual Bastard Cabbage
Evaluation date (mm/dd/yy):	05/13/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	3
1.2	Impact on plant community	A	3
1.3	Impact on higher trophic levels	U	0
1.4	Impact on genetic integrity	D	4

Impact

Enter four characters from Q1.1-1.4 below:

AAUD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	B	4
2.2	Local rate of spread with no management	A	4
2.3	Recent trend in total area infested within state	B	3
2.4	Innate reproductive potential Wksht A	A	4
2.5	Potential for human-caused dispersal	A	3
2.6	Potential for natural long-distance dispersal	C	4
2.7	Other regions invaded	U	0

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

16

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	3
3.2	Distribution/Peak frequency Wksht C	A	3

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.92

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Observational back
Identify ecosystem processes impacted: Since Rapistrum is an annual that contaminates vegetated areas along roadsides, Rapistrum invades and dominates, not allowing soil stabilizing perennials to take hold. Then dies back to expose soil and allow for heavy erosion.	
Sources of information: enter text here Personal Observations: Asher	
Question 1.2 Impact on plant community composition, structure, and interactions	A Observational back
Identify type of impact or alteration: Creates monoculture patches with species dominating >75% of the stand (in some cases 100%).	
Sources of information: enter text here Personal Observations: Gallo, Waitt, Asher, Simmons	
Question 1.3 Impact on higher trophic levels	U No Information back
Identify type of impact or alteration:	
Sources of information: enter text here	
Question 1.4 Impact on genetic integrity	D Rev'd Sci. Pub'n back
Identify impacts: enter text here Related to native Texas Brassicaceae, but no known hybridization.	
Sources of information: enter text here Lemke, D. E., and R. D. Worthington. 1991. Brassica and Rapistrum(Brassicaceae) in Texas. The Southwestern Naturalist 36:197–199.	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Rev'd Sci. Pub'n. back
Describe role of disturbance: enter text here Quick to invade anthropogenic and natural disturbed sites, but will also invade undisturbed areas.	
Sources of information: enter text here Simmons, M. 2005. Bullying the Bullies: The Selective Control of an Exotic, Invasive Annual (Rapistrum rugosum) by Oversowing with a Competitive Native Species (Gaillardia pulchella) Restoration Ecology 13: 609–615.	
Question 2.2 Local rate of spread with no management	A Rev'd Sci. Pub'n back
Describe rate of spread: no information Populations can double every ten years with no management.	
Sources of information: enter text here	

<p>Simmons, M. 2005. Bullying the Bullies: The Selective Control of an Exotic, Invasive Annual (<i>Rapistrum rugosum</i>) by Oversowing with a Competitive Native Species (<i>Gaillardia pulchella</i>) <i>Restoration Ecology</i> 13: 609–615.</p> <p>Personal Observational: Gallo, Waitt</p>	
Question 2.3 Recent trend in total area infested within state	B Observational back
<p>Describe trend: no information</p> <p>Rapistrum is spreading quickly to new areas of the state through roadway construction and contaminated seed mixes.</p>	
<p>Sources of information: enter text here</p> <p>Observational: Gallo, Asher</p>	
Question 2.4 Innate reproductive potential	A Rev'd Sci. Pub'n back
<p>Describe key reproductive characteristics:</p>	
<p>Sources of information:</p> <p>Knuth, P and H. Muller.1908. <i>Handbook of Flower Pollination</i>. Oxford Press.</p> <p>Simmons, M. 2005. Bullying the Bullies: The Selective Control of an Exotic, Invasive Annual (<i>Rapistrum rugosum</i>) by Oversowing with a Competitive Native Species (<i>Gaillardia pulchella</i>) <i>Restoration Ecology</i> 13: 609–615.</p> <p>Lemke, D. E., and R. D. Worthington. 1991. Brassica and Rapistrum(<i>Brassicaceae</i>) in Texas. <i>The Southwestern Naturalist</i> 36:197–199.</p>	
Question 2.5 Potential for human-caused dispersal	A Observational back
<p>Identify dispersal mechanisms: enter text here</p> <p>Seed source is contaminating grasses used roadside revegetation. Therefore Bastard Cabbage is being spread throughout the state by roadways and roadway construction. Quickly colonizes disturbed areas and undisturbed areas adjacent to roadway construction.</p>	
<p>Sources of information: enter text here</p> <p>Personal Observation: Gallo, Waitt, Asher</p>	
Question 2.6 Potential for natural long-distance dispersal	C Rev'd Sci. Pub'n back
<p>Identify dispersal mechanisms: enter text here</p> <p>Seeds tend to fall near parent plant and create clusters from central infestation. No known natural long distance dispersal. Seeds can be washed down roadways and through natural drainages.</p>	
<p>Sources of information: enter text here</p> <p>Lemke, D. E., and R. D. Worthington. 1991. Brassica and Rapistrum(<i>Brassicaceae</i>) in Texas. <i>The Southwestern Naturalist</i> 36:197–199.</p> <p>Personal Observation: Gallo, Waitt</p>	
Question 2.7 Other regions invaded	U No Information back
<p>Identify other regions: enter text here</p>	
<p>Sources of information: enter text here</p>	

Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Sources of information: enter text here	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Sources of information: enter text here	
References	
List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). Websites should include the name of the organization and the date accessed. Personal communications should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.	
Examples:	
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HEAR. Date unknown. Emex spinosa. Hawaiian Ecosystems at Risk. www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009	
DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.	
enter text here	

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	Unknown
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	0
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	0
	6 1
	A
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	A
		Western Crosstimbers	A
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	B
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|--|---|--|
| <p>23 Arizona/New Mexico Mountains</p> <ul style="list-style-type: none"> 23a Chihuahuan Desert Slopes 23b Montane Woodlands <p>24 Chihuahuan Deserts</p> <ul style="list-style-type: none"> 24a Chihuahuan Basins and Playas 24b Chihuahuan Desert Grasslands 24c Low Mountains and Bajadas 24d Chihuahuan Montane Woodlands 24e Stockton Plateau <p>25 High Plains</p> <ul style="list-style-type: none"> 25b Rolling Sand Plains 25e Canadian/Cimarron High Plains 25i Llano Estacado 25j Shinnery Sands 25k Arid Llano Estacado | <p>26 Southwestern Tablelands</p> <ul style="list-style-type: none"> 26a Canadian/Cimarron Breaks 26b Flat Tablelands and Valleys 26c Caprock Canyons, Badlands, and Breaks 26d Semiarid Canadian Breaks <p>27 Central Great Plains</p> <ul style="list-style-type: none"> 27h Red Prairie 27i Broken Red Plains 27j Limestone Plains <p>29 Cross Timbers</p> <ul style="list-style-type: none"> 29b Eastern Cross Timbers 29c Western Cross Timbers 29d Grand Prairie 29e Limestone Cut Plain 29f Carbonate Cross Timbers | <p>30 Edwards Plateau</p> <ul style="list-style-type: none"> 30a Edwards Plateau Woodland 30b Llano Uplift 30c Balcones Canyonlands 30d Semiarid Edwards Plateau <p>31 Southern Texas Plains</p> <ul style="list-style-type: none"> 31a Northern Nueces Alluvial Plains 31b Semiarid Edwards Bajada 31c Texas-Tamaulipan Thornscrub 31d Rio Grande Floodplain and Terraces |
|--|---|--|



TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Sorghum halepense
Synonyms:	<i>Holcus halepensis</i> , <i>Sorghum miliaceum</i>
Common names:	Johnsongrass
Evaluation date (mm/dd/yy):	07/11/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
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Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	Rev'd Sci. Pub'n
1.2	Impact on plant community	A	Other Pub. Mat'l
1.3	Impact on higher trophic levels	A	Other Pub. Mat'l
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

AAAD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	A	Rev'd Sci. Pub'n
2.2	Local rate of spread with no management	A	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	C	Observational
2.4	Innate reproductive potential Wksht A	A	Rev'd Sci. Pub'n
2.5	Potential for human-caused dispersal	A	Rev'd Sci. Pub'n
2.6	Potential for natural long-distance dispersal	A	Rev'd Sci. Pub'n
2.7	Other regions invaded	C	Other Pub. Mat'l

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

17

Use matrix to determine score and enter below:

A

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Rev. Sci. Pub'n back
Identify ecosystem processes impacted:	
Typically, Johnson grass is a good competitor for nutrients space, and water. It can outcompete associated species for water by extracting water from lower soil profiles (12 inches (30 cm) or more below ground). Johnson grass may also negatively impact plant community composition through its reputed allelopathy. Cyanogenetic glycosides and other toxins in Johnson grass may inhibit germination and growth of associated plant species.	
Sources of information: enter text here	
Warwick, S. I.; Black, L. D. 1983. The biology of Canadian weeds. 61. Sorghum halepense (L.) Pers. Canadian Journal of Plant Science. 63: 997-1014. [17451]	
Holm, LeRoy G.; Ploeknett, Donald L.; Pancho, Juan V.; Herberger, James P. 1977. The world's worst weeds: distribution and biology. Honolulu, HI: University Press of Hawaii. 609 p. [20702]	
Question 1.2 Impact on plant community composition, structure, and interactions	A Other Pub. Mat'l back
Identify type of impact or alteration:	
Johnsongrass grows rapidly, is highly competitive with crops, and can be difficult to control. Infestations in crops can reduce harvest yields significantly. Plants are highly variable and many regional biotypes exist.	
Sources of information: enter text here	
Howard, Janet L. 2004. Sorghum halepense. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 11].	
Question 1.3 Impact on higher trophic levels	A Other Pub. Mat'l back
Identify type of impact or alteration:	
Healthy plants can provide good forage for livestock. However, foliage of johnsongrass and other sorghums can produce toxic amounts of hydrocyanic acid when exposed to frost, stressed by drought, or damaged by trampling or herbicides and may be poisonous to livestock when ingested.	
Sources of information: enter text here	
Howard, Janet L. 2004. Sorghum halepense. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 11].	
Stephens, H. A. 1980. Poisonous plants of the central United States. Lawrence, KS: The Regents Press of Kansas. 165 p. [3803]	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
No native species of Sorghum	
Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 11 July 2011: http://wildflower.org/plants/	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Rev'd Sci. Pub'n back
Describe role of disturbance: enter text here	
Johnson grass is a pioneer species, and is often found on old fields, frequently inundated, or otherwise disturbed	

sites. Johnson grass is not restricted to disturbed sites, however; it also invades undisturbed tallgrass and coastal prairies, savannas, and riparian zones	
Sources of information: enter text here	
Howard, Janet L. 2004. Sorghum halepense. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 11].	
Collins, S. L.; Adams, D. E. 1983. Succession in grasslands: thirty-two years of change in a central Oklahoma tallgrass prairie. <i>Vegetatio</i> . 51: 181-190. [2929]	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: no information	
Can easily double in size with no management.	
Sources of information: enter text here	
Howard, Janet L. 2004. Sorghum halepense. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 11].	
Question 2.3 Recent trend in total area infested within state	C Observational back
Describe trend: no information	
Stable.	
Sources of information: enter text here	
Observation: Gallo, T.	
Question 2.4 Innate reproductive potential	A Rev'd Sci. Pub'n back
Describe key reproductive characteristics:	
Refer to Worksheet A	
Sources of information:	
Allen, James A. 1990. Establishment of bottomland oak plantations on the Yazoo National Wildlife Refuge Complex. <i>Southern Journal of Applied Forestry</i> . 14(4): 206-210. [14615]	
Holm, LeRoy G.; Plocknett, Donald L.; Pancho, Juan V.; Herberger, James P. 1977. The world's worst weeds: distribution and biology. Honolulu, HI: University Press of Hawaii. 609 p. [20702]	
Hartzler, Robert G.; Chappell, William E. 1981. Johnsongrass and its control. Blacksburg, VA: Virginia Polytechnic Institute and State University. 3 p. [Script for slide show]. [46717]	
Question 2.5 Potential for human-caused dispersal	A Rev'd Sci. Pub'n back
Identify dispersal mechanisms: enter text here	
Vehicles and construction equipment spread Johnsongrass seeds. "Fill" dirt that is invested with Johnsongrass seeds and rhizomes are commonly moved around on construction sites.	
Sources of information: enter text here	
Allen, James A. 1990. Establishment of bottomland oak plantations on the Yazoo National Wildlife Refuge Complex. <i>Southern Journal of Applied Forestry</i> . 14(4): 206-210. [14615]	
Ghersa, C. M.; Martinez-Ghersa, M. A.; Satorre, E. H.; Van Esso, M. L.; Chichotky, G. 1993. Seed dispersal, distribution and recruitment of seedlings of <i>Sorghum halepense</i> (L.) Pers. <i>Weed Research</i> . 33(1): 79-88. [46689]	
Hartzler, Robert G.; Chappell, William E. 1981. Johnsongrass and its control. Blacksburg, VA: Virginia Polytechnic Institute and State University. 3 p. [Script for slide show]. [46717]	
Hartzler, Robert G.; Gover, Art; Stellingwerf, Joanne. 1991. Factors affecting winter survival of Johnsongrass	

(Sorghum halepense) rhizomes. Weed Technology. 5(1): 108-110. [46712]	
Question 2.6 Potential for natural long-distance dispersal	A Rev'd Sci. Pub'n back
Identify dispersal mechanisms: enter text here	
Seed disperses to greater distances with wind, water, agricultural activities, and animals. Some seed survives ingestion by birds and mammals.	
Sources of information: enter text here	
Allen, James A. 1990. Establishment of bottomland oak plantations on the Yazoo National Wildlife Refuge Complex. Southern Journal of Applied Forestry. 14(4): 206-210. [14615]	
Ghersa, C. M.; Martinez-Ghersa, M. A.; Satorre, E. H.; Van Esso, M. L.; Chichotky, G. 1993. Seed dispersal, distribution and recruitment of seedlings of Sorghum halepense (L.) Pers. Weed Research. 33(1): 79-88. [46689]	
Hartzler, Robert G.; Chappell, William E. 1981. Johnsongrass and its control. Blacksburg, VA: Virginia Polytechnic Institute and State University. 3 p. [Script for slide show]. [46717]	
Hartzler, Robert G.; Gover, Art; Stellingwerf, Joanne. 1991. Factors affecting winter survival of Johnsongrass (Sorghum halepense) rhizomes. Weed Technology. 5(1): 108-110. [46712]	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: enter text here	
Most regions in Texas have been invaded.	
Sources of information: enter text here	
Howard, Janet L. 2004. Sorghum halepense. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, July 11].	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 11 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=SOHA&cn=	
USDA PLANTS Database (Accessed 11 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=SOHA)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 11 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=SOHA&cn=	
USDA PLANTS Database (Accessed 11 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=SOHA)	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	2
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Yes/No?
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	2
Resprouts readily when cut, grazed, or burned	1
	Total Pts
	Total Unknowns
	Score
Note any related traits: enter text here	
Unlike commercial sorghums, glumes tightly enclose seeds and can protect seeds from decomposition in the soil for several years.	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	A
		Chihuahuan Desert Grasslands	B
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	A
		Broken Red Plains	A
		Limestone Plains	A
ER06	Cross Timbers	Eastern Crosstimbres	A
		Western Crosstimbres	A
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	A
		Llano Uplift	A
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	B
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	
		Southern Blackland/Fayette Prairie	A
		Floodplains and Low Terraces	A
ER10	East Central Texas Plains	Northern Post Oak Savanna	A
		Southern Post Oak Savanna	A
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	A
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	C
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	A
		Red River Bottomland	A

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



- | | |
|--|---|
| 32 Texas Blackland Prairies
32a Northern Blackland Prairie
32b Southern Blackland/Fayette Prairie
32c Floodplains and Low Terraces | 33 East Central Texas Plains
33a Northern Post Oak Savanna
33b Southern Post Oak Savanna
33c San Antonio Prairie
33d Northern Prairie Outliers
33e Bastrop Lost Pines
33f Floodplains and Low Terraces |
| 34 Western Gulf Coastal Plain
34a Northern Humid Gulf Coastal Prairies
34b Southern Subhumid Gulf Coastal Prairies
34c Floodplains and Low Terraces
34d Coastal Sand Plain
34e Lower Rio Grande Valley
34f Lower Rio Grande Alluvial Floodplain
34g Texas-Louisiana Coastal Marshes
34h Mid-Coast Barrier Islands and Coastal Marshes
34i Laguna Madre Barrier Islands and Coastal Marshes | 35 South Central Plains
35a Tertiary Uplands
35b Floodplains and Low Terraces
35c Pleistocene Fluvial Terraces
35e Southern Tertiary Uplands
35f Flatwoods
35g Red River Bottomlands |

Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
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Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Tamarix ramosissima
Synonyms:	
Common names:	Salt cedar
Evaluation date (mm/dd/yy):	07/06/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	Rev'd Sci. Pub'n
1.2	Impact on plant community	A	Rev'd Sci. Pub'n
1.3	Impact on higher trophic levels	B	Other Pub. Mat'l
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

AABD

Using matrix, determine score and enter below:

A

2.1	Role of anthropogenic and natural disturbance	A	Rev'd Sci. Pub'n
2.2	Local rate of spread with no management	A	Rev'd Sci. Pub'n
2.3	Recent trend in total area infested within state	B	Observational
2.4	Innate reproductive potential Wksht A	A	Rev'd Sci. Pub'n
2.5	Potential for human-caused dispersal	C	Observational
2.6	Potential for natural long-distance dispersal	A	Rev'd Sci. Pub'n
2.7	Other regions invaded	C	Other Pub. Mat'l

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

16

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**High
No Alert**

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3.15

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Rev'd Sci. Pub'n back
Identify ecosystem processes impacted:	
<p>Taken from the Cal-IPPC assessment of Salt Cedar: <i>Very high water use and increased deposition of salts on soil surface. The longer the community has been invaded by saltcedar the more xeric in nature are the plant species which occupy the understory. Such deposits of salt-encrusted needles can inhibit other species germination. Saltcedar has been blamed for increasing flooding by forming a partial barrier to floodflow, which can cause floodwater to disperse and inundate areas that otherwise would not be flooded. With the invasion of saltcedar there has been an apparent increase in the frequency of fire in riparian ecosystems.</i></p>	
Sources of information: enter text here	
<p>Lovich, J. Tamarix ramosissima. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley.</p> <p>Brotherson, J.D. and D. Field. 1987. Tamarix: impacts of a successful weed. Rangelands 9:110-112.</p> <p>Busch, D.E. and S.D. Smith. 1992. Fire in a riparian shrub community: postburn water relations in the Tamarix-Salix association along the lower Colorado River. Gen. Tech. Rep. In USDA For. Serv. Intermt. Res. Stn. 289:52-55.</p> <p>Kerpez, T. A. and N. S. Smith. 1987. Saltcedar control for wildlife habitat improvement in the southwestern United States. USDI. Fish and Wildlife Serv. Resource Publ. 169. p. 1-16.</p>	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev'd Sci. Pub'n back
Identify type of impact or alteration:	
<p>Saltcedar disrupts the structure and stability of native plant communities and degrades native wildlife habitat by outcompeting and replacing native plant species, monopolizing limited sources of moisture, and increasing the frequency, intensity and effect of fires and floods. They severely limit the number of germination sites that are suitable to cottonwood.</p>	
Sources of information: enter text here	
<p>Howe, W.H. and F.L. Knopf. 1991. On the imminent decline of Rio Grande cottonwoods in central New Mexico. Southwestern Naturalist 36(2):218-224.</p> <p>Muzika, R.M and J.M. Swearingen. 2009. Salt Cedar. Plant Conservation Alliance, Alien Plant Working Group. Accessed 06 July 11: http://www.nps.gov/plants/alien/fact/tama1.htm.</p>	
Question 1.3 Impact on higher trophic levels	B Other Pub. Mat'l back
Identify type of impact or alteration:	
<p>Although it provides some shelter, the foliage and flowers of saltcedar provide little food value for native wildlife species that depend on nutrient-rich native plant resources.</p>	
Sources of information: enter text here	
<p>Muzika, R.M and J.M. Swearingen. 2009. Salt Cedar. Plant Conservation Alliance, Alien Plant Working Group. Accessed 06 July 11: http://www.nps.gov/plants/alien/fact/tama1.htm.</p>	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
<p>No known hybridization with native species.</p>	

Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 5 July 2011: http://wildflower.org/plants/	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Rev'd Sci. Pub'n back
Describe role of disturbance: enter text here	
Can disturb nondisturbed areas, but is more likely to thrive in disturbed riparian areas.	
Sources of information: enter text here	
DiTomaso, J.M. 1998. Impact, biology, and ecology of saltcedar (Tamarix spp.) in the southwestern United States. Weed Technology 12:236-336	
Question 2.2 Local rate of spread with no management	A Rev'd Sci. Pub'n back
Describe rate of spread: no information	
Infestations went from 4,000 ha in 1920 to 362,000 ha in 1960. Recent estimates indicate infestations in the southwestern United States to exceed 600,000 ha .	
Sources of information: enter text here	
DiTomaso, J.M. 1998. Impact, biology, and ecology of saltcedar (Tamarix spp.) in the southwestern United States. Weed Technology 12:236-336	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: no information	
Salt Cedar is a noxious weed and cannot be sold, trafficked or traded. So, this has slowed down the spread. New infestations are being found in new riparian areas along manmade reservoirs and natural waterways. So, it is not doubling in size state wide, but is increasing in total area.	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.4 Innate reproductive potential	A Rev'd Sci. Pub'n back
Describe key reproductive characteristics:	
Refer to Worksheet A	
Sources of information:	
DiTomaso, J.M. 1998. Impact, biology, and ecology of saltcedar (Tamarix spp.) in the southwestern United States. Weed Technology 12:236-336	
Question 2.5 Potential for human-caused dispersal	C Observational back
Identify dispersal mechanisms: enter text here	
Saltcedar is a noxious weed in Texas, therefore is illegal to sell, traffic, or trade. There may be some cases of people transplanting trees to new places, but this is very limited.	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.6 Potential for natural long-distance dispersal	A Rev'd Sci. Pub'n back
Identify dispersal mechanisms: enter text here	
Wind and water dispersed seeds that have a high viability.	
Sources of information: enter text here	
DiTomaso, J.M. 1998. Impact, biology, and ecology of saltcedar (Tamarix spp.) in the southwestern United	

States. Weed Technology 12:236-336	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: enter text here	
Is at least present in most ecotypes in Texas	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 6 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=TARA&cn=	
USDA PLANTS Database (Accessed 6 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=TARA)	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 6 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=TARA&cn=	
USDA PLANTS Database (Accessed 6 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=TARA)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 6 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=TARA&cn=	
USDA PLANTS Database (Accessed 6 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=TARA)	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	1
	7 0
	A
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

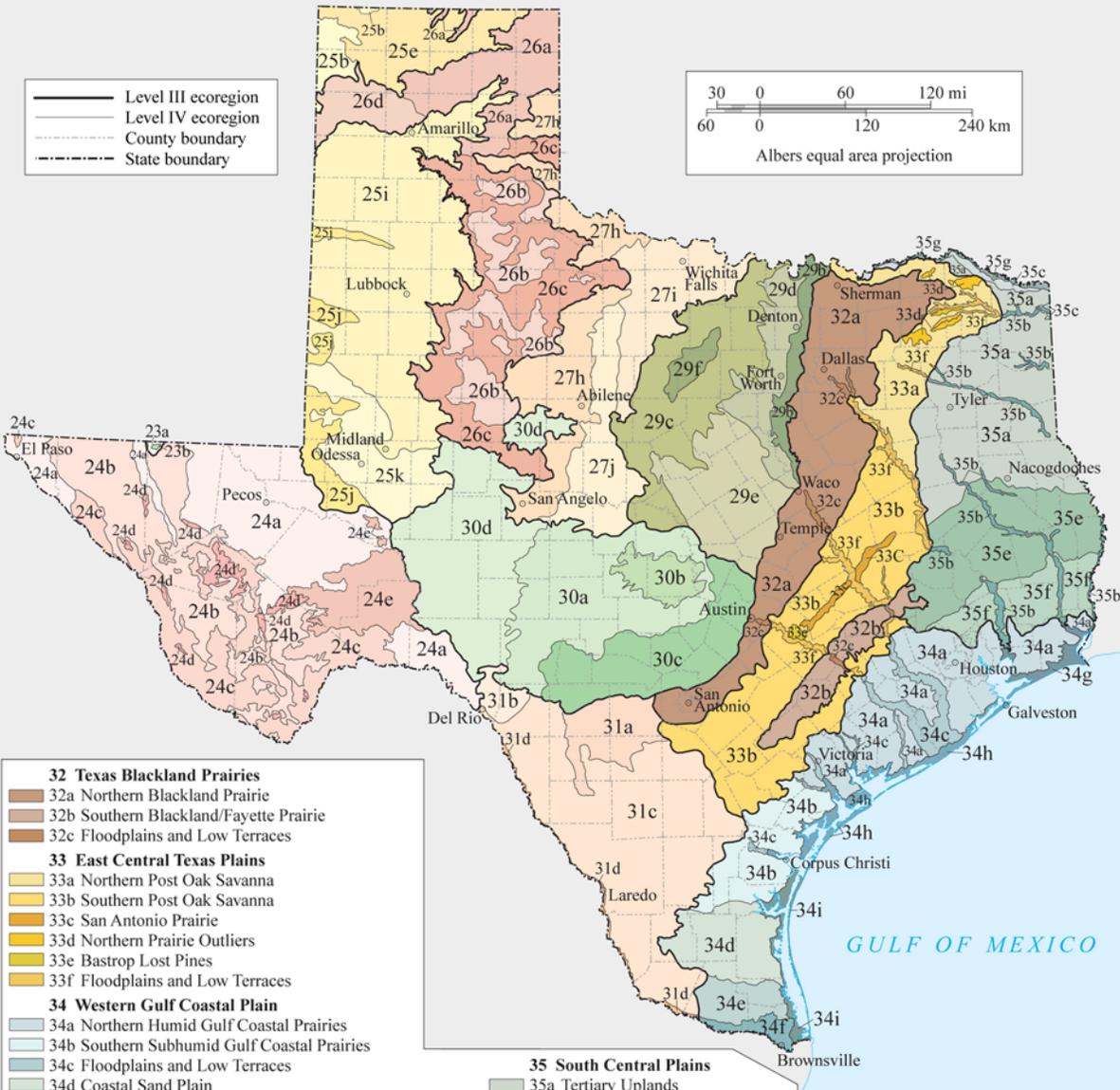
Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	A
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	A
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	A
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	
		Western Crosstimbers	
		Grand Prairie	
		Limestone Cut Plain	A
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	B
		Southern Subhumid Gulf Coastal Prairies	A
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	A
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes	A		
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|--|---|--|
| <p>23 Arizona/New Mexico Mountains</p> <ul style="list-style-type: none"> 23a Chihuahuan Desert Slopes 23b Montane Woodlands <p>24 Chihuahuan Deserts</p> <ul style="list-style-type: none"> 24a Chihuahuan Basins and Playas 24b Chihuahuan Desert Grasslands 24c Low Mountains and Bajadas 24d Chihuahuan Montane Woodlands 24e Stockton Plateau <p>25 High Plains</p> <ul style="list-style-type: none"> 25b Rolling Sand Plains 25e Canadian/Cimarron High Plains 25i Llano Estacado 25j Shinnery Sands 25k Arid Llano Estacado | <p>26 Southwestern Tablelands</p> <ul style="list-style-type: none"> 26a Canadian/Cimarron Breaks 26b Flat Tablelands and Valleys 26c Caprock Canyons, Badlands, and Breaks 26d Semiarid Canadian Breaks <p>27 Central Great Plains</p> <ul style="list-style-type: none"> 27h Red Prairie 27i Broken Red Plains 27j Limestone Plains <p>29 Cross Timbers</p> <ul style="list-style-type: none"> 29b Eastern Cross Timbers 29c Western Cross Timbers 29d Grand Prairie 29e Limestone Cut Plain 29f Carbonate Cross Timbers | <p>30 Edwards Plateau</p> <ul style="list-style-type: none"> 30a Edwards Plateau Woodland 30b Llano Uplift 30c Balcones Canyonlands 30d Semiarid Edwards Plateau <p>31 Southern Texas Plains</p> <ul style="list-style-type: none"> 31a Northern Nueces Alluvial Plains 31b Semiarid Edwards Bajada 31c Texas-Tamaulipan Thornscrub 31d Rio Grande Floodplain and Terraces |
|--|---|--|



- Level III ecoregion
- Level IV ecoregion
- - - County boundary
- - - State boundary

- 32 Texas Blackland Prairies**
- 32a Northern Blackland Prairie
 - 32b Southern Blackland/Fayette Prairie
 - 32c Floodplains and Low Terraces
- 33 East Central Texas Plains**
- 33a Northern Post Oak Savanna
 - 33b Southern Post Oak Savanna
 - 33c San Antonio Prairie
 - 33d Northern Prairie Outliers
 - 33e Bastrop Lost Pines
 - 33f Floodplains and Low Terraces
- 34 Western Gulf Coastal Plain**
- 34a Northern Humid Gulf Coastal Prairies
 - 34b Southern Subhumid Gulf Coastal Prairies
 - 34c Floodplains and Low Terraces
 - 34d Coastal Sand Plain
 - 34e Lower Rio Grande Valley
 - 34f Lower Rio Grande Alluvial Floodplain
 - 34g Texas-Louisiana Coastal Marshes
 - 34h Mid-Coast Barrier Islands and Coastal Marshes
 - 34i Laguna Madre Barrier Islands and Coastal Marshes

- 35 South Central Plains**
- 35a Tertiary Uplands
 - 35b Floodplains and Low Terraces
 - 35c Pleistocene Fluvial Terraces
 - 35e Southern Tertiary Uplands
 - 35f Flatwoods
 - 35g Red River Bottomlands

Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Ailanthus altissima
Synonyms:	
Common names:	Tree-of-heaven
Evaluation date (mm/dd/yy):	4/25/2011
Evaluator #1 Name/Title:	Travis Gallo, Ecologist
Affiliation:	Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, TX 78739
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for City of Austin Invasive Species Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	B	4
1.2	Impact on plant community	A	4
1.3	Impact on higher trophic levels	U	No Information
1.4	Impact on genetic integrity	D	2

Impact

Enter four characters from Q1.1-1.4 below:

BAUD

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	B	3
2.2	Local rate of spread with no management	A	3
2.3	Recent trend in total area infested within state	C	2
2.4	Innate reproductive potential Wksht A	B	3
2.5	Potential for human-caused dispersal	B	4
2.6	Potential for natural long-distance dispersal	A	4
2.7	Other regions invaded	D	2

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

13

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	3
3.2	Distribution/Peak frequency Wksht C	A	3

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3.08

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	B Rev'd Sci. Pub'n back
Identify ecosystem processes impacted: Roots change soil chemistry through allelopathy.	
Sources of information: De Feo et al. 2003. Isolation of phytotoxic compounds from Tree-of-Heaven (<i>Ailanthus altissima</i> Swingle). J. Agric. Food Chem. 51:1177-1180.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev'd Sci. Pub'n back
Identify type of impact or alteration:	
Prolific seed producer, forms abundant root sprouts, creating monospecific stands, eliminating other vegetation. Combined with toxins, these strategies appear to give it a competitive advantage. Kowarik characterizes <i>Ailanthus</i> as a pioneering light-demanding species that may use clonal ramets to overcome lack of light.	
Sources of information: enter text here Fryer, Janet L. 2010. <i>Ailanthus altissima</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, April 25]. Kowarik, I. 1995. The clonal growth of <i>Ailanthus altissima</i> on a natural site in West Virginia. Journal of Vegetation Science 6(6) 853-856.	
Question 1.3 Impact on higher trophic levels	U No Information back
Identify type of impact or alteration: Impact to higher trophic levels is unknown in Texas.	
Sources of information: Observational, Gallo	
Question 1.4 Impact on genetic integrity	D Observational back
Identify impacts: No close relatives, and no known hybridization with native plants	
Sources of information: Observational, Waitt	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Other Pub. Mat'l back
Describe role of disturbance: Mostly invades disturbed forests but can invade undisturbed forests.	
Sources of information: Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research	

Station. 93 p.	
Fryer, Janet L. 2010. <i>Ailanthus altissima</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, April 25].	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: Once established colonies can spread quickly from root sprouts invading from disturbed areas into undisturbed forest edges and meadows. <i>Ailanthus</i> is an urban species that is spreading out to suburban and rural areas. In Texas, <i>Ailanthus</i> can spread quickly (doubling in less than 10 years) into new areas once established.	
Sources of information:	
Fryer, Janet L. 2010. <i>Ailanthus altissima</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, April 25].	
Landenberger, R.E., N.L. Kota, J.B. McGraw. 2007. Seed dispersal of the non-native invasive tree <i>Ailanthus altissima</i> into contrasting environments. <i>Plant Ecology</i> 192:55-70.	
Observational, Gallo.	
Question 2.3 Recent trend in total area infested within state	C Observational back
Describe trend: <i>Ailanthus</i> seems to be stable on a statewide basis. Most ecosystems invaded.	
Sources of information: Observational, Gallo	
Invaders of Texas Citizen Science Program: http://texasinvasives.org/observations/mapping.php?search=Go&species=AIAL	
Question 2.4 Innate reproductive potential	B Other Pub. Mat'l back
Describe key reproductive characteristics: Refer to Worksheet A	
Sources of information:	
Fryer, Janet L. 2010. <i>Ailanthus altissima</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, April 25].	
Question 2.5 Potential for human-caused dispersal	B Rev'd Sci. Pub'n back
Identify dispersal mechanisms: Not commonly sold in landscape trade since early 1900's, but a simple internet search does result in the sale of seeds and saplings.	
Sources of information: enter text here	
Fryer, Janet L. 2010. <i>Ailanthus altissima</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, April 25].	

<p>Landenberger, R.E., N.L. Kota, J.B. McGraw. 2007. Seed dispersal of the non-native invasive tree <i>Ailanthus altissima</i> into contrasting environments. <i>Plant Ecology</i> 192:55-70.</p> <p>Observational, Gallo.</p>	
<p>Question 2.6 Potential for natural long-distance dispersal</p>	<p>A Rev'd Sci. Pub'n back</p>
<p>Identify dispersal mechanisms: Wind and water can disperse samaras long distances.</p>	
<p>Sources of information: enter text here</p> <p>Fryer, Janet L. 2010. <i>Ailanthus altissima</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, April 25].</p> <p>Landenberger, R.E., N.L. Kota, J.B. McGraw. 2007. Seed dispersal of the non-native invasive tree <i>Ailanthus altissima</i> into contrasting environments. <i>Plant Ecology</i> 192:55-70.</p> <p>Kowarik, I. 1995. The clonal growth of <i>Ailanthus altissima</i> on a natural site in West Virginia. <i>Journal of Vegetation Science</i> 6(6) 853-856.</p> <p>Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p.</p>	
<p>Question 2.7 Other regions invaded</p>	<p>D Observational back</p>
<p>Identify other regions: Similar regions invaded elsewhere</p>	
<p>Sources of information: Observational, Gallo.</p>	
<p>Distribution</p>	
<p>Question 3.1 Ecological amplitude/Range</p>	<p>A Other Pub. Mat'l back</p>
<p>Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Refer to Worksheet B</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=AIAL&cn=).</p> <p>USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=AIAL).</p>	
<p>Question 3.2 Distribution/Peak frequency</p>	<p>A Other Pub. Mat'l back</p>
<p>Describe distribution: Worksheet B</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=AIAL&cn=).</p> <p>USDA PLANTS Database (Accessed 9 May 2011:</p>	

http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=AIAL).

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	No: 0 pts
Dense infestations produce >1,000 viable seed per square meter	Yes: 2 pts
Populations of this species produce seeds every year.	Yes: 1 pts
Seed production sustained over 3 or more months within a population annually	No: 0 pts
Seeds remain viable in soil for three or more years	No: 0 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	No: 0 pts
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Yes: 1 pts
Fragments easily and fragments can become established elsewhere	No: 0 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pts
	5 0
	B

Note any related traits:
Resprouts vigorously when cut, burned or grazed

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	B
		Low Mountains and Bajadas	B
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbres	
		Western Crosstimbres	A
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	C
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	A
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Broussonetia papyrifera
Synonyms:	Morus papyrifera, Papyrius papyriferus
Common names:	Paper mulberry
Evaluation date (mm/dd/yy):	07/08/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	U	No Information
1.2	Impact on plant community	A	Other Pub. Mat'l
1.3	Impact on higher trophic levels	B	Other Pub. Mat'l
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

UABD

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	A	Other Pub. Mat'l
2.2	Local rate of spread with no management	A	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	U	Observational
2.4	Innate reproductive potential Wksht A	A	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	B	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
2.7	Other regions invaded	U	Observational

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

13

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.61

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	U No Information back
Identify ecosystem processes impacted:	
Sources of information: enter text here	
Question 1.2 Impact on plant community composition, structure, and interactions	A Other Pub. Mat'l back
Identify type of impact or alteration:	
Creates a monotypic stand displacing native vegetation.	
Sources of information: enter text here	
Morgan, EC. 2004. Wildland Weeds: Paper Mulberry, <i>Broussonetia papyrifera</i> . Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication # ENY-702.	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas. IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
National Park Service & U.S. Fish and Wildlife Service. 2010. Plant Invaders of Mid-Atlantic Natural Areas.	
Question 1.3 Impact on higher trophic levels	B Other Pub. Mat'l back
Identify type of impact or alteration:	
Reduces native diversity that birds and wildlife depend on.	
Sources of information: enter text here	
Morgan, EC. 2004. Wildland Weeds: Paper Mulberry, <i>Broussonetia papyrifera</i> . Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication # ENY-702.	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas. IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
No native species of <i>Broussonetia</i>	
Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 8 July 2011: http://wildflower.org/plants/	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: enter text here	
Readily invades disturbed areas, but can invade undisturbed areas.	
Sources of information: enter text here	
Morgan, EC. 2004. Wildland Weeds: Paper Mulberry, <i>Broussonetia papyrifera</i> . Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication # ENY-702.	

Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
Describe rate of spread: no information	
Will quickly invade an area without management.	
Sources of information: enter text here	
National Park Service & U.S. Fish and Wildlife Service. 2010. Plant Invaders of Mid-Atlantic Natural Areas.	
Question 2.3 Recent trend in total area infested within state	U Observational back
Describe trend: no information	
Paper Mulberry is not well documented throughout the state.	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
Describe key reproductive characteristics:	
Refer to Worksheet A	
Sources of information:	
Morgan, EC. 2004. Wildland Weeds: Paper Mulberry, <i>Broussonetia papyrifera</i> . Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication # ENY-702.	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas. IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
National Park Service & U.S. Fish and Wildlife Service. 2010. Plant Invaders of Mid-Atlantic Natural Areas.	
Question 2.5 Potential for human-caused dispersal	B Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Paper Mulberry is usually discouraged by municipalities do to its quick and weedy growth under power lines, but is still planted as an ornamental and hedge row.	
Sources of information: enter text here	
Swearingen, JM. 2009. Paper Mulberry. National Park Service, National Capital Region, Center for Urban Ecology, Washington, DC	
Observation: T. Gallo	
Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Birds and animals eat berries and readily spread seeds.	
Sources of information: enter text here	
Morgan, EC. 2004. Wildland Weeds: Paper Mulberry, <i>Broussonetia papyrifera</i> . Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication # ENY-702.	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas. IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
Question 2.7 Other regions invaded	U Observational back
Identify other regions: enter text here	
Paper Mulberry is not well documented throughout the state.	

Sources of information: enter text here	
Observation: T. Gallo	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B.	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 11 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=BRPA4&cn=	
USDA PLANTS Database (Accessed 11 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=BRPA4)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B.	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 11 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=BRPA4&cn=	
USDA PLANTS Database (Accessed 11 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=BRPA4)	
References	
List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). Websites should include the name of the organization and the date accessed. Personal communications should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.	
Examples:	
Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. Weed Technology. 9: 402-404.	
HEAR. Date unknown. Emex spinosa. Hawaiian Ecosystems at Risk. www.hear.org/pier/species/emex_spinosa.htm . Accessed March 17, 2009	
DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.	
enter text here	

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	0
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	0
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	1
	6 1
	A
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crossttimbers	
		Western Crossttimbers	A
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	C
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	A
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	C
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Centaurea melitensis
Synonyms:	
Common names:	Malta starthistle, tocalote
Evaluation date (mm/dd/yy):	05/09/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
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Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	C	3
1.2	Impact on plant community	B	3
1.3	Impact on higher trophic levels	B	3
1.4	Impact on genetic integrity	B	3

Impact

Enter four characters from Q1.1-1.4 below:

CBBB

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	B	3
2.2	Local rate of spread with no management	A	2
2.3	Recent trend in total area infested within state	B	2
2.4	Innate reproductive potential Wksht A	A	4
2.5	Potential for human-caused dispersal	A	3
2.6	Potential for natural long-distance dispersal	A	3
2.7	Other regions invaded	B	3

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

18

Use matrix to determine score and enter below:

A

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	3
3.2	Distribution/Peak frequency Wksht C	A	3

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3.15

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	C Other Pub. Mat'l back
Identify ecosystem processes impacted: Can reduce soil moisture in areas of high infestations.	
Sources of information: Joe DiTomaso, University of California-Davis, ditomaso@vegmail.ucdavis.edu Weed Records and Information Center (WeedRIC) - Yellow Starthistle: http://wric.ucdavis.edu/yst .	
Question 1.2 Impact on plant community composition, structure, and interactions	B Other Pub. Mat'l back
Identify type of impact or alteration: Can dominate native grasslands and create monocultures.	
Sources of information: Joe DiTomaso, University of California-Davis, ditomaso@vegmail.ucdavis.edu Weed Records and Information Center (WeedRIC) - Yellow Starthistle: http://wric.ucdavis.edu/yst . Donaldson, S. and Dawn Rafferty. 2002. Identification and Management of Malta Starthistle. University of Nevada: Fact Sheet-02-86. Observational - Gallo	
Question 1.3 Impact on higher trophic levels	B Other Pub. Mat'l back
Identify type of impact or alteration: Poisonous to horses. Recreationalist will not go into areas of investment due to spines. Spines can injure mouth of wildlife.	
Sources of information: Joe DiTomaso, University of California-Davis, ditomaso@vegmail.ucdavis.edu Weed Records and Information Center (WeedRIC) - Yellow Starthistle: http://wric.ucdavis.edu/yst . Donaldson, S. and Dawn Rafferty. 2002. Identification and Management of Malta Starthistle. University of Nevada: Fact Sheet-02-86.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: None.	
Sources of information: Joe DiTomaso, University of California-Davis, ditomaso@vegmail.ucdavis.edu Weed Records and Information Center (WeedRIC) - Yellow Starthistle: http://wric.ucdavis.edu/yst .	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Other Pub. Mat'l back
Describe role of disturbance: Usually found in disturbed areas, both human and natural disturbances, but can also invade undisturbed grasslands.	
Sources of information: Joe DiTomaso, University of California-Davis, ditomaso@vegmail.ucdavis.edu Weed Records and Information	

Center (WeedRIC) - Yellow Starthistle: http://wric.ucdavis.edu/yst .	
Donaldson, S. and Dawn Rafferty. 2002. Identification and Management of Malta Starthistle. University of Nevada: Fact Sheet-02-86.	
U.S. Forest Service. 2010. A field guide to managing Malta Starthistle. United States Agriculture Forest Service. TP-R3-16-1.	
Question 2.2 Local rate of spread with no management	A Observational back
Describe rate of spread: Has not been in Texas as long as other Western states, therefore more areas are being invaded. Local rate of spread is fairly high without management.	
Sources of information: Observational - Gallo	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: Is spreading in Western and Northwestern portion of state, but not doubling area in less than 10 years.	
Sources of information: Observational - Gallo	
Question 2.4 Innate reproductive potential	A Rev'd, Sci. Pub'n back
Describe key reproductive characteristics: Refer to Worksheet A	
Sources of information:	
U.S. Forest Service. 2010. A field guide to managing Malta Starthistle. United States Agriculture Forest Service. TP-R3-16-1.	
DiTomaso, J.M. and J.D. Gerlach, Jr.. <i>Centaurea melitensis</i> . In, <i>Invasive Plants of California's Wildlands</i> . CalEPPC. UC Press, Berkeley; Gerlach, J.D. Jr. 2000. Ph.D. Dissertation, UC Davis.	
Gerlach, J.D., and K.J. Rice. 2003. Testing life history correlates of invasiveness using congeneric plant species. <i>Ecological Applications</i> 13:167–179.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Seeds and seed head stick to vehicles and machinery. Spread in contaminated seed mixes. Infestations commonly found around electric boxes, sewer entries, and other facilities accessed by vehicles.	
Sources of information: enter text here	
U.S. Forest Service. 2010. A field guide to managing Malta Starthistle. United States Agriculture Forest Service. TP-R3-16-1.	
DiTomaso, J.M. and J.D. Gerlach, Jr.. <i>Centaurea melitensis</i> . In, <i>Invasive Plants of California's Wildlands</i> . CalEPPC. UC Press, Berkeley; Gerlach, J.D. Jr. 2000. Ph.D. Dissertation, UC Davis.	
Donaldson, S. and Dawn Rafferty. 2002. Identification and Management of Malta Starthistle. University of Nevada: Fact Sheet-02-86.	
Observational - Gallo	

Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Seeds fall near the parent plant, are dispersed short distances by wind or longer distances by humans, animals, water, and soil movements	
Sources of information: enter text here California Department of Food and Agriculture, EncycloWeedia. 2002. Yellow starthistle. Malta starthistle or Tocalote. Sicilian starthistle. <i>Ed by:</i> Healy, E.A., S. Enloe, J.M. DiTomaso, B. Roberson, N. Dechoretz, S. Schoenig, P. Akers, L. Butler, and J. Garvin. Non-Cropland Weed group, UC Extension Service, Weed Science Program, Department of Vegetable Crops, The University of California. Davis, CA. 95616. website: http://pi.cdfa.ca.gov/weedinfo/CENTAUREB2.htm .	
Question 2.7 Other regions invaded	B Other Pub. Mat'l back
Identify other regions: Has invaded coastal prairies and open woodlands in California.	
Sources of information: Joe DiTomaso. 2003. Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands. California Invasive Plant and Pest Council.	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here Refer to Worksheet B	
Sources of information: Invaders of Texas Citizen Science Observations (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=CEME2&cn= USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=CEME2)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here Refer to Worksheet B	
Sources of information: enter text here Invaders of Texas Citizen Science Observations (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=CEME2&cn= USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=CEME2)	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	0
Seeds remain viable in soil for three or more years	2
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	0
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	0
	7 pts 0
	A
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	A
		Chihuahuan Desert Grasslands	A
		Low Mountains and Bajadas	A
		Chihuahuan Montane Woodlands	A
		Stockton Plateau	A
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	C
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	
		Western Crosstimbers	A
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	A
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	A
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Colocasia esculenta
Synonyms:	Colocasia antiquorum
Common names:	Elephant Ear
Evaluation date (mm/dd/yy):	07/05/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	B	Other Pub. Mat'l
1.2	Impact on plant community	A	Observational
1.3	Impact on higher trophic levels	U	Observational
1.4	Impact on genetic integrity	D	Observational

Impact

Enter four characters from Q1.1-1.4 below:

BAUD

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	A	Other Pub. Mat'l
2.2	Local rate of spread with no management	A	Observational
2.3	Recent trend in total area infested within state	B	Observational
2.4	Innate reproductive potential Wksht A	A	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
2.7	Other regions invaded	C	Observational

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

18

Use matrix to determine score and enter below:

A

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.5

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	B Other Pub. Mat'l back
Identify ecosystem processes impacted: Extensive stands of this herb alter the vegetational structure and dynamics of riparian plant communities.	
Sources of information: enter text here Weber, Ewald. 2003. Invasive plants of the World. CABI Publishing, CAB International, Wallingford, UK. 548 pp.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Observational back
Identify type of impact or alteration: Creates monocultures along riparian areas and outcompetes native herbaceous riparian plants. Coupled with the invasive nutria, establishment of native plants in restoration is difficult. Elephant ear is toxic to nutria, therefore they eat only native herbaceous plants leaving the Elephant Ear to take over.	
Sources of information: enter text here Observational: T. Gallo, City of Austin, Watershed Protection Department environmental staff	
Question 1.3 Impact on higher trophic levels	U Observational back
Identify type of impact or alteration: Unknown	
Sources of information: enter text here Unknown.	
Question 1.4 Impact on genetic integrity	D Observational back
Identify impacts: enter text here No known hybridization with native species.	
Sources of information: enter text here Observational: Dr. Damon Waitt, Lady Bird Johnson Wildflower Center	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: enter text here Can establish in non-disturbed waterways.	
Sources of information: enter text here Langeland, K.A. and K.C. Burks. 2008. <i>Identification and Biology of Non-Native Plants in Florida's Natural Areas</i> . Florida Exotic Pest and Plant Council. Accessed 05 July 11: http://www.fleppc.org/ID_book/Colocasia%20esculenta.pdf .	
Question 2.2 Local rate of spread with no management	A Observational back
Describe rate of spread: no information Can spread greater than doubling every 10 years with no management.	
Sources of information: enter text here	

Observational: Jackie Poole, Minnette Mar, & T. Gallo	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: no information	
Since this species is still for sale, it will continue to colonize suitable habitat. Outside of the San Marcos River, there seems to be little management happening throughout the state.	
Sources of information: enter text here	
Observational: Jackie Poole	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
Describe key reproductive characteristics:	
Refer to Worksheet A	
Sources of information:	
Langeland, K.A. and K.C. Burks. 2008. <i>Identification and Biology of Non-Native Plants in Florida's Natural Areas</i> . Florida Exotic Pest and Plant Council. Accessed 05 July 11: http://www.fleppc.org/ID_book/Colocasia%20esculenta.pdf .	
Weber, Ewald. 2003. <i>Invasive plants of the World</i> . CABI Publishing, CAB International, Wallingford, UK.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
One of the most common plants sold as a pond plant.	
Sources of information: enter text here	
National Biological Information Infrastructure Online. 2010. Elephant Ear. Accessed 06 July 11: http://www.nbi.gov/portal/server.pt?open=512&objID=798&&PageID=2262&mode=2&in_hi_userid=2&cached=true .	
Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Fragments are easily broken off and transported down waterways.	
Sources of information: enter text here	
Langeland, K.A. and K.C. Burks. 2008. <i>Identification and Biology of Non-Native Plants in Florida's Natural Areas</i> . Florida Exotic Pest and Plant Council. Accessed 05 July 11: http://www.fleppc.org/ID_book/Colocasia%20esculenta.pdf .	
Weber, Ewald. 2003. <i>Invasive plants of the World</i> . CABI Publishing, CAB International, Wallingford, UK.	
Question 2.7 Other regions invaded	C Observational back
Identify other regions: enter text here	
Has not invaded all riparian areas that could be invaded, but this aquatic invader does not fit the criteria for answering this question.	
Sources of information: enter text here	
Observational: T. Gallo	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to	

the state, if known: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 6 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=COES &cn=	
USDA PLANTS Database (Accessed 6 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol= COES)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 6 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=COES &cn=	
USDA PLANTS Database (Accessed 6 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol= COES)	
References	
List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). Websites should include the name of the organization and the date accessed. Personal communications should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.	
Examples:	
Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. <i>Weed Technology</i> . 9: 402-404.	
HEAR. Date unknown. <i>Emex spinosa</i> . Hawaiian Ecosystems at Risk. www.hear.org/pier/species/emex_spinosa.htm . Accessed March 17, 2009	
DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.	
enter text here	
Jackie Poole, Ph.D., State Botanist, Texas Parks and Wildlife Department.	
Minnette Marr, Botanist, Lady Bird Johnson Wildflower Center at the University of Texas at Austin.	
Travis Gallo, Ecologist, Lady Bird Johnson Wildflower Center at the University of Texas at Austin.	
Damon Waitt, Ph.D., Senior Botanist, Lady Bird Johnson Wildflower Center at the University of Texas at Austin.	

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	0
Populations of this species produce seeds every year.	0
Seed production sustained over 3 or more months within a population annually	0
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	2
Resprouts readily when cut, grazed, or burned	1
	6 0
	A

Note any related traits: enter text here

Rhizome fragments are easily carried by streams, and floods can dislodge bud-laden rhizomes from the banks

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	A
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	
		Western Crosstimbers	
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	A
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	B
		Southern Subhumid Gulf Coastal Prairies	A
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	A
		Red River Bottomland	

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Cynodon dactylon
Synonyms:	Capriola dactylon, Panicum dactylon
Common names:	Bermudagrass
Evaluation date (mm/dd/yy):	07/12/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Originally assessed for the City of Austin Invasive Management Plan

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	B	Other Pub. Mat'l
1.2	Impact on plant community	A	Other Pub. Mat'l
1.3	Impact on higher trophic levels	U	No Information
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

BAUD

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	C	Other Pub. Mat'l
2.2	Local rate of spread with no management	B	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	B	Observational
2.4	Innate reproductive potential Wksht A	A	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	C	Other Pub. Mat'l
2.7	Other regions invaded	C	Other Pub. Mat'l

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

13

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.7

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	B Other Pub. Mat'l back
Identify ecosystem processes impacted:	
Holds soil well and is used as erosion control, but also competes with and displaces native plants, alters the soil ecology by de-oxygenating, alters geomorphological processes and hydrology, alters species composition and richness, and alters alpha and beta diversity.	
Sources of information: enter text here	
Marshall, R.M., S. Anderson, M. Batchler, P. Comer, S. Cornelius, R. Cox, A. Gondor, D. Gori, J. Humke, R. Paredes Aquilar, I.E. Parra, and S. Schwartz. 2000. An ecological analysis of conservation priorities in the Sonoran Desert Ecoregion. Prepared by The Nature Conservancy Arizona Chapter, Sonoran Institute, and Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora with support from the Department of Defense Legacy Program, Agency and Institutional partners. 146 pp.	
Guertin, P., and W.L. Halvorson. 2003. Status of Fifty Introduced Plants in Southern Arizona Parks. U.S. Geological Survey, Sonoran Desert Research Station, School of Natural Resources, University of Arizona, Tucson. Available online at: http://sdrsnet.snr.arizona.edu/index.php?page=datamenu&lib=2&sublib=13 ; accessed May 2011.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Other Pub. Mat'l back
Identify type of impact or alteration:	
Bermudagrass is an early successional species that can dominate once established. It greatly reduces native biodiversity by creating a monoculture once established. It can dominate stands by >75%. Has potential of being allelopathic.	
Sources of information: enter text here	
Guertin, P., and W.L. Halvorson. 2003. Status of Fifty Introduced Plants in Southern Arizona Parks. U.S. Geological Survey, Sonoran Desert Research Station, School of Natural Resources, University of Arizona, Tucson. Available online at: http://sdrsnet.snr.arizona.edu/index.php?page=datamenu&lib=2&sublib=13 ; accessed May 2011.	
Horowitz, M. 1973. Spatial growth of <i>Sorghum halepense</i> . Weed Research 13:200-208.	
Personal Observation: Gallo	
Question 1.3 Impact on higher trophic levels	U No Information back
Identify type of impact or alteration:	
Due to its highly competitive ability it is thought Bermudagrass would have an effect on high trophic levels, but the literature does not cover impacts on native higher trophic levels.	
Sources of information: enter text here	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
No known impact on genetic integrity.	
Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 12 July 2011: http://wildflower.org/plants/	

Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	C Other Pub. Mat'l back
Describe role of disturbance: enter text here	
Bermuda grass is sensitive to shade and frost damage, and only invades disturbed land. Thus, although abundant throughout the world, the threat from the invasion of this plant is limited to warm, sunny, disturbed sites.	
Sources of information: enter text here	
Newman, D. BugWoodWiki: Cynodon dactylon. Accessed 12 July 2011: http://wiki.bugwood.org/Cynodon_dactylon	
Holm, L. G., P. Donald, J. V. Pancho, and J. P. Herberger. 1977. The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu, Hawaii. 609 pp.	
Question 2.2 Local rate of spread with no management	B Other Pub. Mat'l back
Describe rate of spread: no information	
In Arizona, spreads slowly once established.	
Sources of information: enter text here	
Arizona-Sonoma Desert Museum Programs and Research. 1996-2003. Biological survey of Ironwood Forest National Monument: exotic plants assessment. http://www.desertmuseum.org/programs/ifnm_exotic.html .	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: no information	
Although not spreading quickly, as long as it can be introduced to new areas the infestation will continue to	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
Describe key reproductive characteristics:	
Refer to Worksheet A.	
Sources of information:	
Newman, D. BugWoodWiki: Cynodon dactylon. Accessed 12 July 2011: http://wiki.bugwood.org/Cynodon_dactylon	
Holm, L. G., P. Donald, J. V. Pancho, and J. P. Herberger. 1977. The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu, Hawaii. 609 pp.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Bermudagrass is the most commonly planted grass as turf grass. Is moved through contaminated hay and equipment. Usually spreads from site of introduction.	
Sources of information: enter text here	
Hudson, W. 2011. New exotic invasive fly found damaging bermudagrass forage crops in Georgia. University of Georgia College of Agriculture and Environmental Sciences. Accessed 12 July 2011: http://www.caes.uga.edu/Applications/ImpactStatements/index.cfm?referenceInterface=IMPACT_STATEMENT&subInterface=detail_main&PK_ID=3278 .	

Duble, R.L. Bermudagrass: The Sport Turf of the South. Texas Cooperative Extension. Accessed 12 July 2011: http://aggiehorticulture.tamu.edu/archives/parsons/turf/publications/bermuda.html .	
Question 2.6 Potential for natural long-distance dispersal	C Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Seeds and rhizomes can spread by wind or water. Seeds can survive submerged for over 50 days.	
Sources of information: enter text here	
Newman, D. BugWoodWiki: Cynodon dactylon. Accessed 12 July 2011: http://wiki.bugwood.org/Cynodon_dactylon	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: enter text here	
Introduced in 1943, its found in most regions of Texas.	
Sources of information: enter text here	
Corriher, V.A. and L.A. Redmon. Bermudagrass varieties, hybrids, and blends for Texas, #SCS-2009-11. Extension Forage Specialists, Overton and College Station, TX. Accessed 12 July 2011: http://forages.tamu.edu/PDF/Bermudagrass%20Varieties.pdf	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Did not fill out worksheet B. USDA PLANTS Database shows more than 3 major ecotypes invaded.	
Sources of information: enter text here	
USDA PLANTS Database (Accessed 8 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=HYVE3)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Did not fill out worksheet B. USDA PLANTS Database shows more than 3 major ecotypes invaded.	
Sources of information: enter text here	
USDA PLANTS Database (Accessed 8 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=HYVE3)	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	0
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	2
Resprouts readily when cut, grazed, or burned	1
	9 1
	A
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
 C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	
		Western Crosstimbers	
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Firmiana simplex
Synonyms:	Firmiana platanifolia (L. f.) Schott & Endl., Sterculia platanifolia L.
Common names:	Chinese parasoltree
Evaluation date (mm/dd/yy):	07/05/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Originally assessed for the City of Austin Invasive Management Plan

Due to very little information about the invasiveness of Chinese Parasol Tree this assessment is done largely on observations by the evaluator, and should be evaluated a second time by a resource manager on the ground dealing with the control of Chinese Parasol Tree.

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	A	Observational
1.2	Impact on plant community	B	Observational
1.3	Impact on higher trophic levels	U	No Information
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

ABUD

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	A	Observational
2.2	Local rate of spread with no management	B	Observational
2.3	Recent trend in total area infested within state	B	Observational
2.4	Innate reproductive potential Wksht A	B	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
2.7	Other regions invaded	U	No Information

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

15

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.00

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	A Observational back
Identify ecosystem processes impacted: Creates a large canopy depleting light to understory plants. Understory below parasol canopy is usually absent of native vegetation.	
Sources of information: enter text here Observation: Gallo, T.	
Question 1.2 Impact on plant community composition, structure, and interactions	B Observational back
Identify type of impact or alteration: Does not dominate the plant community, but does reduce populations by shading out understory plants.	
Sources of information: enter text here Observation: Gallo, T.	
Question 1.3 Impact on higher trophic levels	U No Information back
Identify type of impact or alteration:	
Sources of information: enter text here	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here No related species.	
Sources of information: enter text here Waitt, D. 2011. Native Plant Information Network. Accessed 6 July 2011: http://wildflower.org/plants/	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Observational back
Describe role of disturbance: enter text here Can invade undisturbed forested areas.	
Sources of information: enter text here Observation: T. Gallo	
Question 2.2 Local rate of spread with no management	B Observational back
Describe rate of spread: no information Increasing but less rapidly.	
Sources of information: enter text here Observation: T. Gallo	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: no information Increasing but less rapidly.	

Sources of information: enter text here	
Observation: T. Gallo	
Question 2.4 Innate reproductive potential	B Other Pub. Mat'l back
Describe key reproductive characteristics:	
Refer to Worksheet A.	
Sources of information:	
Henderson State University. 2011. Chinese Parasol Tree. Accessed 11 July 2011: http://www.hsu.edu/interior2.aspx?id=8584 .	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Still commonly sold, promoted and traded in Texas.	
Sources of information: enter text here	
Houston Chronicle. 2008. 10 Fast Growing Trees Worth Considering. Accessed 11 July 2011: http://www.chron.com/disp/story.mpl/gardening/top10/5060122.html .	
Observation: T. Gallo	
Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Seeds can be dispersed long distances by the wind.	
Sources of information: enter text here	
Question 2.7 Other regions invaded	U No Information back
Identify other regions: enter text here	
Sources of information: enter text here	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B. Very little information on distribution.	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 11 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=FIS12&cn=	
USDA PLANTS Database (Accessed 11 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=FIS12)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B. Very little information on distribution.	

Sources of information: enter text here

Invaders of Texas Citizen Science Observations (Accessed 11 July 2011:
<http://texasinvasives.org/observations/search.php?satellite=&sn=FISI2&cn=>

USDA PLANTS Database (Accessed 11 July 2011:
http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=FISI2)

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	0
Seeds remain viable in soil for three or more years	Unknown
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	0
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	0
	5 0
	B
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	
		Western Crosstimbers	
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	
		Southern Blackland/Fayette Prairie	A
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	A
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|--|---|--|
| <p>23 Arizona/New Mexico Mountains</p> <ul style="list-style-type: none"> 23a Chihuahuan Desert Slopes 23b Montane Woodlands <p>24 Chihuahuan Deserts</p> <ul style="list-style-type: none"> 24a Chihuahuan Basins and Playas 24b Chihuahuan Desert Grasslands 24c Low Mountains and Bajadas 24d Chihuahuan Montane Woodlands 24e Stockton Plateau <p>25 High Plains</p> <ul style="list-style-type: none"> 25b Rolling Sand Plains 25e Canadian/Cimarron High Plains 25i Llano Estacado 25j Shinnery Sands 25k Arid Llano Estacado | <p>26 Southwestern Tablelands</p> <ul style="list-style-type: none"> 26a Canadian/Cimarron Breaks 26b Flat Tablelands and Valleys 26c Caprock Canyons, Badlands, and Breaks 26d Semiarid Canadian Breaks <p>27 Central Great Plains</p> <ul style="list-style-type: none"> 27h Red Prairie 27i Broken Red Plains 27j Limestone Plains <p>29 Cross Timbers</p> <ul style="list-style-type: none"> 29b Eastern Cross Timbers 29c Western Cross Timbers 29d Grand Prairie 29e Limestone Cut Plain 29f Carbonate Cross Timbers | <p>30 Edwards Plateau</p> <ul style="list-style-type: none"> 30a Edwards Plateau Woodland 30b Llano Uplift 30c Balcones Canyonlands 30d Semiarid Edwards Plateau <p>31 Southern Texas Plains</p> <ul style="list-style-type: none"> 31a Northern Nueces Alluvial Plains 31b Semiarid Edwards Bajada 31c Texas-Tamaulipan Thornscrub 31d Rio Grande Floodplain and Terraces |
|--|---|--|



Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	B	Rev'd, Sci. Pub'n (4)
1.2	Impact on plant community	B	Rev'd, Sci. Pub'n (4)
1.3	Impact on higher trophic levels	C	Rev'd, Sci. Pub'n (4)
1.4	Impact on genetic integrity	U	No Information (0)

Impact

Enter four characters from Q1.1-1.4 below:

BBCU

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	B (2 pts)	Other Pub. Mat'l (3)
2.2	Local rate of spread with no management	B (2 pts)	Rev'd, Sci. Pub'n (4)
2.3	Recent trend in total area infested within state	B (2 pts)	Observational (2)
2.4	Innate reproductive potential Wksht A	A (3 pts)	Rev'd, Sci. Pub'n (4)
2.5	Potential for human-caused dispersal	A (3 pts)	Anecdotal (1)
2.6	Potential for natural long-distance dispersal	B (2 pts)	Other Pub. Mat'l (3)
2.7	Other regions invaded	C (1 pt)	Other Pub. Mat'l (3)

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

13

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	Observational (2)
3.2	Distribution/Peak frequency Wksht C	A	Observational (2)

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	B Rev'd, Sci. Pub'n back
Identify ecosystem processes impacted: Fire and light.	
Climbing Japanese honeysuckle can become ladder fuel. Fire may reach 15 feet or more into the canopy on Japanese honeysuckle vines (Munger, 2002). Non-indigenous species with high productivity that change community structure, resulting in reductions in light availability, have higher evapotranspiration rates than the native vegetation or fix nitrogen. Thus, they are likely to modify competitive interactions (Gordon 1998).	
Sources of information:	
GORDON, D. R. 1998. EFFECTS OF INVASIVE, NON-INDIGENOUS SPECIES ON ECOSYSTEM PROCESSES: LESSONS FROM FLORIDA, Ecological Applications 8:975-989.	
Munger, Gregory T. 2002. Lonicera japonica. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 25].	
Question 1.2 Impact on plant community composition, structure, and interactions	B Rev'd, Sci. Pub'n back
Identify type of impact or alteration: Outcompetes and Displaces Native Species	
As Gordon points out, twining of Japanese honeysuckle through canopy eventually leads to the collapse of the native canopy. Climbing can also lead to the restriction of and the toppling of small native saplings causing an opening in a canopy allowing for a monoculture growth of Japanese honeysuckle.	
Sources of information: enter text here	
GORDON, D. R. 1998. EFFECTS OF INVASIVE, NON-INDIGENOUS SPECIES ON ECOSYSTEM PROCESSES: LESSONS FROM FLORIDA, Ecological Applications 8:975-989.	
Question 1.3 Impact on higher trophic levels	C Rev'd, Sci. Pub'n back
Identify type of impact or alteration: Decrease in biodiversity	
There may be an anecdotal impact due to the loss of biodiversity, but in general the cover created by Japanese honeysuckle offers refuge for various bird species and other vertebrates. Nectar is used by hummingbirds and fruits are eaten by birds. Browsers tend to use it as a food source.	
Sources of information: enter text here	
RICKETTS, M. S., AND G. RITCHISON. 2009. NESTING SUCCESS OF YELLOW-BREASTED CHATS: EFFECTS OF NEST SITE AND TERRITORY VEGETATION STRUCTURE, The Wilson Bulletin 112:510-516.	
Question 1.4 Impact on genetic integrity	U No Information back
Identify impacts: enter text here	

Sources of information: enter text here	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Other Pub. Mat'l back
Describe role of disturbance: As both Munger and Starr report not only is Japanese honeysuckle prolific in disturbed areas, it can invader natural areas as well. Long range seed dispersal by birds is common and allows this species to invade various habitats such as prairies, barrens, wetlands, floodplain and upland forests.	
Sources of information: enter text here Munger, Gregory T. 2002. <i>Lonicera japonica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 28]. STARR, F., K. STARR, AND L. LOOPE. 2003. <i>Lonicera japonica</i> , Pp. 1-9 (U. S. G. S.-B. R. Division and H. F. Station, eds.), Maui, Hawai'i.	
Question 2.2 Local rate of spread with no management	B Rev'd, Sci. Pub'n back
Describe rate of spread: no information A growth rates of 1.5 m/year is probably typical according to Leatherman, although Bell et al. recorded a maximum shoot elongation of 4.6 mm/day in Maryland. According to Dillenburg, in one year, <i>Lonicera japonica</i> overtopped a three-year old sweetgum (<i>Liquidambar styraciflua</i>) trees. <i>Lonicera japonica</i> vines spread both vertically and horizontally (Williams 1994).	
Sources of information: enter text here Dillenburg, L.R., D.F. Whigham, A.H. Teramura, and I.N. Forseth. 1993a. Effects of vine competition on availability of light, water, and nitrogen to a tree host (<i>Liquidambar styraciflua</i>). American Journal of Botany 80:244-253. Leatherman, A.D. 1955. Ecological life-history of <i>Lonicera japonica</i> Thunb. Ph.D. thesis. University of Tennessee. 97 pp. Williams, C.E. 1994. Invasive alien plant species of Virginia. Dept. Conservation and Recreation. Richmond, VA.	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: Citizen Science data from the Invaders of Texas program is showing that <i>Lonicera japonica</i> is spreading rapidly throughout the state of Texas. However, the actual distribution of <i>L. japonica</i> is unknown throughout the state, so the citizen science data may not be a true representation of the actual spread of the species. Observations from other individuals familiar with the spread of <i>L. japonica</i> also confirm the rapid spread.	
Sources of information: enter text here Personal communication with Dr. Damon Waitt, Senior Botanist, Lady Bird Johnson Wildflower Center and Mike Murphrey from the Texas Forest Service.	

Question 2.4 Innate reproductive potential	A Rev'd, Sci. Pub'n back
Describe key reproductive characteristics:	Refer to Worksheet A
Sources of information:	
Reaches reproductive maturity in 2 years or less: Little, S., and H. A. Somes. 1967. Results of herbicide trials to control Japanese honeysuckle. U.S. Forest Service, Northeast Forest Exp. Sta. Res. Note 62: 18.	
Dense infestations produce >1,000 viable seed per square meter: Nyboer, Randy. 1992. Vegetation management guideline: Japenese honeysuckle (<i>Lonicera japonica</i> Thunb.). Natural Areas Journal. 12(4): 217-218.	
Populations of this species produce seeds every year: Munger, Gregory T. 2002. <i>Lonicera japonica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 25].	
Seed production sustained over 3 or more months within a population annually: Seeds remain viable in soil for three or more years: Leatherman, A.D. 1955. Ecological life-history of <i>Lonicera japonica</i> Thunb. Ph.D. thesis. University of Tennessee. 97 pp.	
Viable seed produced with <i>both</i> self-pollination and cross-pollination: Larson, Katherine C.; Fowler, Sherry P.; Walker, Jason C. 2002. Lack of pollinators limits fruit set in the exotic <i>Lonicera japonica</i> . The American Midland Naturalist. 148: 54-60	
Reproduces vegetatively: : Munger, Gregory T. 2002. <i>Lonicera japonica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 25].	
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes: : Munger, Gregory T. 2002. <i>Lonicera japonica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 25].	
Fragments easily and fragments can become established elsewhere: Munger, Gregory T. 2002. <i>Lonicera japonica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 25].	
Resprouts readily when cut, grazed, or burned: : Munger, Gregory T. 2002. <i>Lonicera japonica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 25].	
Question 2.5 Potential for human-caused dispersal	A Observational back
Identify dispersal mechanisms: enter text here	
Lonicera japonica is commonly sold at most commercial nursery and landscape retailers throughout the state. It is common practice, in the state of Texas, to plant L. japonica as forage food for white-tailed deer in order to recruit the deers.	
Sources of information: enter text here	
Personal knowledge by the assessor.	
Question 2.6 Potential for natural long-distance dispersal	B Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Japanese honeysuckle seeds are frequently dispersed by frugivorous birds and small mammals. Bird dispersal is typically by species that frequent brushy areas, thickets, and forest openings. Birds that frequent forest openings,	

<p>for example, usually fly from 1 opening to another, depositing seeds at each roosting site. This means of seed dispersal generally ensures deposition in a habitat where the seedling has a high probability of success, such as beneath a sapling tree suitable for stem twining.</p>	
<p>Sources of information: enter text here</p> <p>Munger, Gregory T. 2002. <i>Lonicera japonica</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2009, September 25].</p>	
<p>Question 2.7 Other regions invaded</p>	<p>C Observational back</p>
<p>Identify other regions: enter text here</p> <p><i>Lonicera japonica</i> has invaded all ecoregions of Texas except the Chihuahuan desert. No known records of <i>L. japonica</i> invaded desert ecosystem</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science data, USDA Plants Database, and The Atlas of Vascular Plants.</p>	
<p>Distribution</p>	
<p>Question 3.1 Ecological amplitude/Range</p>	<p>A Observational back</p>
<p>Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here</p> <p>Refer to Worksheet B</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=LOJA&cn=).</p> <p>USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=LOJA).</p>	
<p>Question 3.2 Distribution/Peak frequency</p>	<p>A Observational back</p>
<p>Describe distribution: enter text here</p> <p>Refer to Worksheet B</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=LOJA&cn=).</p> <p>USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=LOJA).</p>	

References

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www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

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Dillenburg, L.R., D.F. Whigham, A.H. Teramura, and I.N. Forseth. 1993a. Effects of vine competition on availability of light, water, and nitrogen to a tree host (*Liquidambar styraciflua*). *American Journal of Botany* 80:244-253.

GORDON, D. R. 1998. EFFECTS OF INVASIVE, NON-INDIGENOUS SPECIES ON ECOSYSTEM PROCESSES: LESSONS FROM FLORIDA, *Ecological Applications* 8:975-989.

Larson, Katherine C.; Fowler, Sherry P.; Walker, Jason C. 2002. Lack of pollinators limits fruit set in the exotic *Lonicera japonica*. *The American Midland Naturalist*. 148: 54-60

Leatherman, A.D. 1955. Ecological life-history of *Lonicera japonica* Thunb. Ph.D. thesis. University of Tennessee. 97 pp.

Little, S., and H. A. Somes. 1967. Results of herbicide trials to control Japanese honeysuckle. U.S. Forest Service, Northeast Forest Exp. Sta. Res. Note 62: 18.

Munger, Gregory T. 2002. *Lonicera japonica*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2009, September 25].

Nyboer, Randy. 1992. Vegetation management guideline: Japanese honeysuckle (*Lonicera japonica* Thunb.). *Natural Areas Journal*. 12(4): 217-218.

RICKETTS, M. S., AND G. RITCHISON. 2009. NESTING SUCCESS OF YELLOW-BREASTED CHATS: EFFECTS OF NEST SITE AND TERRITORY VEGETATION STRUCTURE, *The Wilson Bulletin* 112:510-516.

Turner, R.L., H. Nichols, G. Denny, O. Doron. 2003. Atlas of the Vascular Plants of Texas. BRIT Press: Fort Worth, Texas.

Williams, C.E. 1994. Invasive alien plant species of Virginia. Dept. Conservation and Recreation. Richmond, VA.

Personal communication with Dr. Damon Waitt, Senior Botanist, Lady Bird Johnson Wildflower Center and Mike Murphrey from the Texas Forest Service.

Worksheet A

Reaches reproductive maturity in 2 years or less	No: 0 pt
Dense infestations produce >1,000 viable seed per square meter	Yes: 2 pts
Populations of this species produce seeds every year.	Yes: 1 pt
Seed production sustained over 3 or more months within a population annually	Yes: 1 pt
Seeds remain viable in soil for three or more years	No: 0 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	No: 0 pt
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Yes: 1 pt
Fragments easily and fragments can become established elsewhere	No: 0 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pt
	6 pts 0
	A (6+ pts)
Note any related traits: Although sexual maturity may not be reached in less than two years, in year 3-6 seed productions is prolific.	
Nyboer, Randy. 1992. Vegetation management guideline: Japanese honeysuckle (<i>Lonicera japonica</i> Thunb.).	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%; C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
ER04	Southwestern Tablelands	Arid Llano Estacado	
		Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
ER05	Central Great Plains	Semiarid Canadian Breaks	
		Red Prairie	
		Broken Red Plains	A
ER06	Cross Timbers	Limestone Plains	
		Eastern Crosstimbers	A
		Western Crosstimbers	A
		Grand Prairie	A
		Limestone Cut Plain	A
ER07	Edwards Plateau	Carbonate Cross Timbers	
		Edwards Plateau Woodland	A
		Llano Uplift	
		Balcones Canyonlands	A
ER08	Southern Texas Plains	Semiarid Edwards Plateau	
		Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
ER09	Texas Blackland Prairies	Rio Grande Floodplain and Terraces	
		Northern Blackland Prairies	
		Southern Blackland/Fayette Prairie	A
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	A
		Southern Post Oak Savanna	C
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	A
ER11	Western Gulf Coastal Plain	Floodplains and Low Terraces	
		Northern Humid Gulf Coastal Prairies	
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
Mid-Coast Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Laguna Madre Barrier Islands and Coastal Marshes	
		Tertiary Uplands	A
		Floodplains and Low Terraces	C
		Pleistocene Fluvial Terraces	A
		Southern Tertiary Uplands	A
		Flatwoods	A

| | Red River Bottomland | |

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Macfadyena unguis-cati
Synonyms:	<i>Batocydia unguis-cati</i> (L.) Mart. ex Britt., <i>Bignonia tweedieana</i> Lindl., <i>Bignonia unguis-cati</i> L., <i>Doxantha unguis-cati</i> (L.) Miers
Common names:	Catclaw Vine
Evaluation date (mm/dd/yy):	06/20/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Originally assessed for the City of Austin Invasive Management Plan

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	B	Other Pub. Mat'l
1.2	Impact on plant community	A	Other Pub. Mat'l
1.3	Impact on higher trophic levels	E	No Information
1.4	Impact on genetic integrity	D	No Information

Impact

Enter four characters from Q1.1-1.4 below:

BAED

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	A	Other Pub. Mat'l
2.2	Local rate of spread with no management	A	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	B	Observational
2.4	Innate reproductive potential Wksht A	A	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	B	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
2.7	Other regions invaded	C	Observational

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

17

Use matrix to determine score and enter below:

A

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.15

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	B Other Pub. Mat'l back
Identify ecosystem processes impacted: Can cover ground with thick vegetation becoming dominant ground cover reducing light availability for new growth in forests.	
Sources of information: enter text here Florida Exotic Pest Plant Council (FLEPPC). Undated. <i>Macfadyena unguis-cati</i> (L.) A. Gentry. Florida Exotic Pest Plant Council Website. Accessed 20 June 2011: http://www.fleppc.org/ID_book/Macfadyena%20unguis-cati.pdf . McClymont, Ken. 1996. Cat's Claw Creeper (<i>Macfadyena unguis-cati</i>). BRAIN (Brisbane Rainforest Action & Information Network) Newsletter, April 1996.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Other Pub. Mat'l back
Identify type of impact or alteration: Becomes dominant ground cover in forest environments. Will kill mature trees by weight and reducing light. Known as an ecosystem "transformer".	
Sources of information: enter text here Florida Exotic Pest Plant Council (FLEPPC). Undated. <i>Macfadyena unguis-cati</i> (L.) A. Gentry. Florida Exotic Pest Plant Council Website. Accessed 20 June 2011: http://www.fleppc.org/ID_book/Macfadyena%20unguis-cati.pdf . McClymont, Ken. 1996. Cat's Claw Creeper (<i>Macfadyena unguis-cati</i>). BRAIN (Brisbane Rainforest Action & Information Network) Newsletter, April 1996. PIER (Pacific Island Ecosystems at Risk) 1999. <i>Macfadyena unguis-cati</i> (L.) Gentry, Bignoniaceae. Accessed 20 June 2011: http://www.hear.org/Pier/species/macfadyena_unguis-cati.htm .	
Question 1.3 Impact on higher trophic levels	E No Information back
Identify type of impact or alteration: No known impact to higher trophic levels.	
Sources of information: enter text here	
Question 1.4 Impact on genetic integrity	D No Information back
Identify impacts: enter text here No known hybridization with native flora.	
Sources of information: enter text here	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l back
Describe role of disturbance: enter text here Can invade undisturbed forest readily.	
Sources of information:	

<p>Florida Exotic Pest Plant Council (FLEPPC). Undated. <i>Macfadyena unguis-cati</i> (L.) A. Gentry. Florida Exotic Pest Plant Council Website. Accessed 20 June 2011: http://www.fleppc.org/ID_book/Macfadyena%20unguis-cati.pdf.</p> <p>McClymont, Ken. 1996. Cat's Claw Creeper (<i>Macfadyena unguis-cati</i>). BRAIN (Brisbane Rainforest Action & Information Network) Newsletter, April 1996.</p> <p>PIER (Pacific Island Ecosystems at Risk) 1999. <i>Macfadyena unguis-cati</i> (L.) Gentry, Bignoniaceae. Accessed 20 June 2011: http://www.hear.org/Pier/species/macfadyena_unguis-cati.htm.</p>	
Question 2.2 Local rate of spread with no management	A Other Pub. Mat'l back
<p>Describe rate of spread: May stay in seedling stage for a while, but once tuber is formed it spreads quickly. Population can double in less than 10 years without management.</p>	
<p>Sources of information: enter text here</p> <p>Florida Exotic Pest Plant Council (FLEPPC). Undated. <i>Macfadyena unguis-cati</i> (L.) A. Gentry. Florida Exotic Pest Plant Council Website. Accessed 20 June 2011: http://www.fleppc.org/ID_book/Macfadyena%20unguis-cati.pdf.</p> <p>Gallo, T. 2008. TexasInvasives.org Invasive Plant Database: <i>Macfadyena unguis-cati</i>. Accessed 20 June 2011: http://texasinvasives.org/plant_database/detail.php?symbol=MAUN3.</p> <p>Observational: T. Gallo</p>	
Question 2.3 Recent trend in total area infested within state	B Observational back
<p>Describe trend: no information</p> <p>Could not double statewide in less than 10 years. Are is increasing due to the spread of local populations.</p>	
<p>Sources of information: enter text here</p> <p>Observational: T. Gallo</p>	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
<p>Describe key reproductive characteristics:</p> <p>Refer to Worksheet A.</p>	
<p>Sources of information:</p> <p>PIER (Pacific Island Ecosystems at Risk) 1999. <i>Macfadyena unguis-cati</i> (L.) Gentry, Bignoniaceae. Accessed 20 June 2011: http://www.hear.org/Pier/species/macfadyena_unguis-cati.htm.</p> <p>National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG). 2008. Global Invasive Species Database: <i>Macfadyena unguis-cati</i>. Accessed 20 June 2011: http://www.invasivespecies.net/database/species/ecology.asp?si=1227&fr=1&sts=&lang=EN.</p>	
Question 2.5 Potential for human-caused dispersal	B Other Pub. Mat'l back
<p>Identify dispersal mechanisms: enter text here</p> <p>Cat claw Vine is available and commonly sold at nurseries. It is also promoted through the TX AgriLife Extension as an "Earthwise" plant.</p>	
<p>Sources of information: enter text here</p> <p>Mueller, C. 2009. <i>CatClaw Vine (MacFadyena unguis-cati)</i>. Texas AgriLife Extension Service, Texas A&M University, College Station, Texas. Accessed 20 June 2011: http://aggie-horticulture.tamu.edu/newsletters/hortupdate/2009/apr09/Catclaw.html</p> <p>Observational: T. Gallo</p>	

Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Seeds are wind and water dispersed. Also, vines grow quickly along the ground and reroor at nodes.	
Sources of information: enter text here	
National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG). 2008. Global Invasive Species Database: Macfadyena unguis-cati. Accessed 20 June 2011: http://www.invasivespecies.net/database/species/ecology.asp?si=1227&fr=1&sts=&lang=EN .	
Question 2.7 Other regions invaded	C Observational back
Identify other regions: enter text here	
All ecoregions have been invaded	
Sources of information: enter text here	
Observational: T. Gallo	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Program (Accessed 20 June 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=MAUN3&cn=).	
USDA PLANTS Database (Accessed 20 June 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=MAUN3).	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Program (Accessed 20 June 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=MAUN3&cn=).	
USDA PLANTS Database (Accessed 20 June 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=MAUN3).	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	0
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	0
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	1
	6 1
	A
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	
		Western Crosstimbers	
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	A
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	C
		Southern Subhumid Gulf Coastal Prairies	A
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Nandina domestica
Synonyms:	
Common names:	Sacred bamboo
Evaluation date (mm/dd/yy):	4/12/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for City of Austin Invasive Species Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: Nandina domestica

Region: Texas

<u>1.1</u>	Impact on abiotic ecosystem processes	U	No Information
<u>1.2</u>	Impact on plant community	B	3
<u>1.3</u>	Impact on higher trophic levels	C	3
<u>1.4</u>	Impact on genetic integrity	D	No Information

Impact
Enter four characters from Q1.1-1.4 below:
U B C D
Using matrix, determine score and enter below:
C

<u>2.1</u>	Role of anthropogenic and natural disturbance	A	Other Pub. Mat'l
<u>2.2</u>	Local rate of spread with no management	B	Observational
<u>2.3</u>	Recent trend in total area infested within state	B	Observational
<u>2.4</u>	Innate reproductive potential <u>Wksht A</u>	A	Other Pub. Mat'l
<u>2.5</u>	Potential for human-caused dispersal	A	Other Pub. Mat'l
<u>2.6</u>	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
<u>2.7</u>	Other regions invaded	A	Other Pub. Mat'l

Invasiveness
Enter the sum total of all points for Q2.1-2.7 below:
19
Use matrix to determine score and enter below:
A

Plant Score
Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:
Medium
No Alert

<u>3.1</u>	Ecological amplitude/Range	A	Other Pub. Mat'l
<u>3.2</u>	Distribution/Peak frequency <u>Wksht C</u>	A	Other Pub. Mat'l

Distribution
Using matrix, determine score and enter below:
A

Documentation
Average of all questions
2.8

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	U No Information back
Identify ecosystem processes impacted: No known impact on abiotic ecosystem processes	
Sources of information: Observational, Gallo	
Question 1.2 Impact on plant community composition, structure, and interactions	B Other pub. Mat'l
Identify type of impact or alteration: Dominates forest understory and outcompetes native vegetation (Miller, 2003; UF/IFAS 2008). Displaces native species and disrupts plant communities (USDA Forest Service 2006). <i>Nandina</i> is listed as a Class I invasive species by the Florida Exotic Pest Plant Council which means that it is "actively disrupting plant communities" (Scheper, 2008).	
Sources of information: enter text here Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p. Scheper, J. (2008) <i>Nandina domestica</i> . FloriData. (http://www.floridata.com/ref/N/nand_dom.cfm) Accessed: April 6, 2009. UF/IFAS Center for Aquatic and Invasive Plants. 2008. <i>Nandina domestica</i> . University of Florida. (http://plants.ifas.ufl.edu/node/281) Accessed: April 12, 2011. USDA Forest Service, Forest Health Staff. (2006) Weed of the Week, <i>Nandina</i> , WO 04-28-06. (http://www.invasive.org/weedcd/pdfs/wow/nandina.pdf) Accessed: April 12, 2011.	
Question 1.3 Impact on higher trophic levels	C Other pub. Mat'l
Identify type of impact or alteration: Can be toxic to grazing animals (Russell et al, 1997)	
Sources of information: Dr. Alice B. Russell, Dr. James W. Hardin, Dr. Larry Grand, Plant Pathology; and Dr. Angela Fraser. 1997. "Poisonous Plants of North Carolina". North Carolina State University Accessed 12 April 2011: www.ces.ncsu.edu/depts/hort/consumer/poison/Nandido.htm .	
Question 1.4 Impact on genetic integrity	D No Information back
Identify impacts: No known hybridization	
Sources of information: Observational, Gallo	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Other Pub. Mat'l
Describe role of disturbance: Can establish in undisturbed woodlands.	

Sources of information: Stone, Katharine R. 2009. <i>Nandina domestica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Accessed 13 April 2011: http://www.fs.fed.us/database/feis/ .	
Question 2.2 Local rate of spread with no management	B Observational
Describe rate of spread: In local areas it seems to be increasing, but not doubling <10 years.	
Sources of information: Gallo, Observational	
Question 2.3 Recent trend in total area infested within state	B Observational
Describe trend: <i>N. domestica</i> has steadily increased in central, north, and east Texas. But the range seems to be static, but the overall area being infested in these regions is increasing.	
Sources of information: Gallo, observational	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
Describe key reproductive characteristics:	
Sources of information: Cherry, Hillary M. 2002. Ecophysiology and control of <i>Nandina domestica</i> . Gainesville, FL: University of Florida. 74 p. Thesis Stone, Katharine R. 2009. <i>Nandina domestica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Accessed 13 April 2011: http://www.fs.fed.us/database/feis/ .	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Various websites and nurseries list it as a common plant sold and bought as an ornamental	
Sources of information: Welch, W. 2002. <i>Nandinas</i> are excellent landscape plants. Horticulture Updates, Texas A&M University Horticulture. Accessed 13 April 2011.	
Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Berries are readily eaten by birds and mammals. They are also dispersed by water.	
Sources of information: Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research	

Station. 93 p.	
Stone, Katharine R. 2009. <i>Nandina domestica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Accessed 13 April 2011: http://www.fs.fed.us/database/feis/ .	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: Has invaded most southern forest throughout the US. Particularly TN, FL, GA, LA, NC, VA.	
Sources of information:	
Stone, Katharine R. 2009. <i>Nandina domestica</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Accessed 13 April 2011: http://www.fs.fed.us/database/feis/ .	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=NADO&cn=).	
USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=NADO)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Program (Accessed 9 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=NADO&cn=).	
USDA PLANTS Database (Accessed 9 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=NADO)	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

Miller, J.H. (2003) Nonnative invasive plants of southern forests: a field guide for identification and control. Gen.Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p.

Scheper, J. (2008) *Nandina domestica*. FloriData. (http://www.floridata.com/ref/N/nand_dom.cfm) Accessed: April 6, 2009.

UF/IFAS Center for Aquatic and Invasive Plants. 2008. *Nandina domestica*. University of Florida. (<http://plants.ifas.ufl.edu/node/281>) Accessed: April 12, 2011.

USDA Forest Service, Forest Health Staff. (2006) Weed of the Week, *Nandina*, WO 04-28-06. (<http://www.invasive.org/weeded/pdfs/wow/nandina.pdf>) Accessed: April 12, 2011.

Stone, Katharine R. 2009. *Nandina domestica*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Accessed 13 April 2011: <http://www.fs.fed.us/database/feis/>.

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	0
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	0
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	1
	6 1
	A
Note any related traits: enter text here	

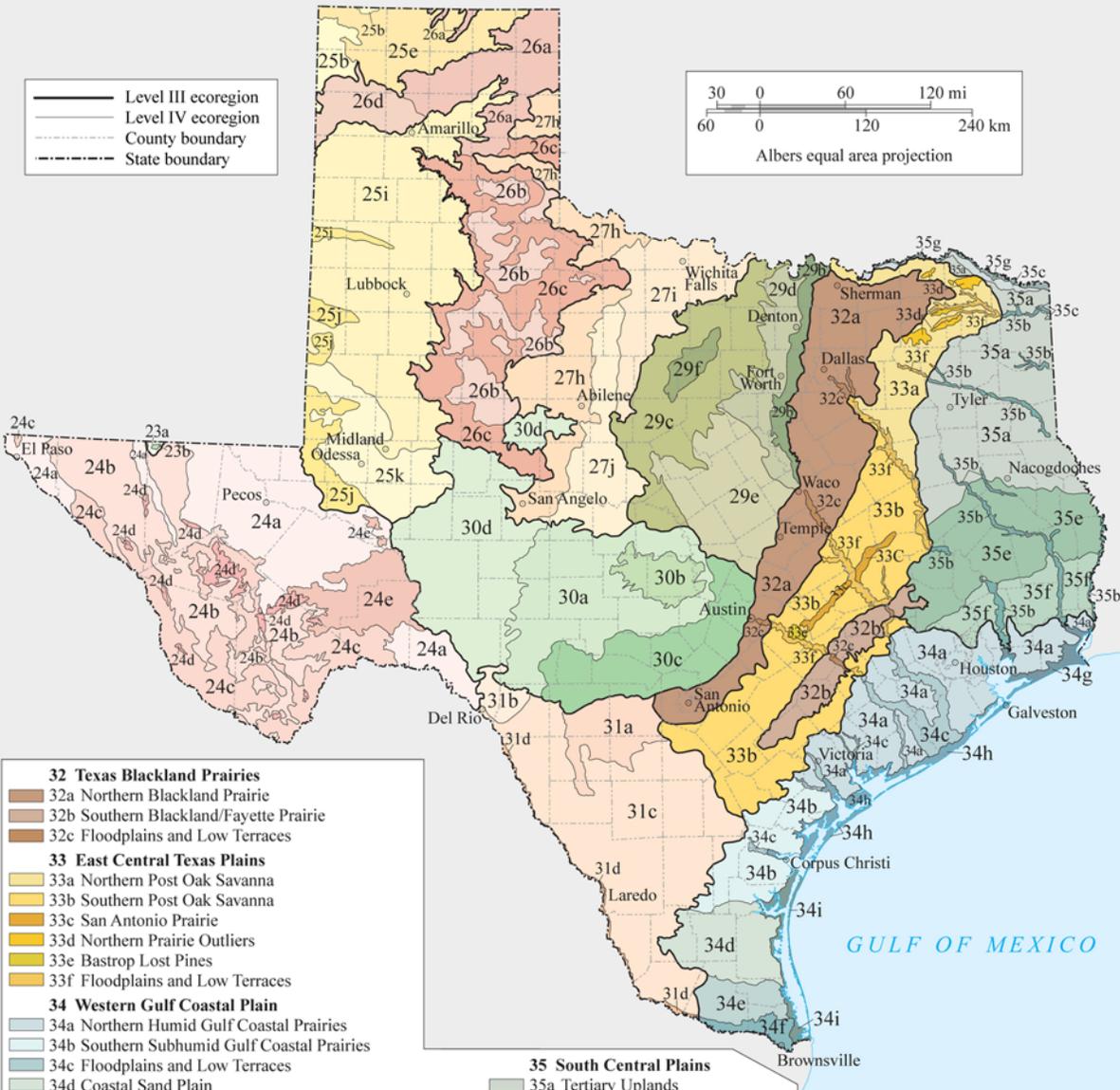
Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	A
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	A
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbres	A
		Western Crosstimbres	A
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	A
		Llano Uplift	A
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	A
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	A
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	A
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	C
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	A
		Flatwoods	A
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|--|---|--|
| <p>23 Arizona/New Mexico Mountains</p> <ul style="list-style-type: none"> 23a Chihuahuan Desert Slopes 23b Montane Woodlands <p>24 Chihuahuan Deserts</p> <ul style="list-style-type: none"> 24a Chihuahuan Basins and Playas 24b Chihuahuan Desert Grasslands 24c Low Mountains and Bajadas 24d Chihuahuan Montane Woodlands 24e Stockton Plateau <p>25 High Plains</p> <ul style="list-style-type: none"> 25b Rolling Sand Plains 25e Canadian/Cimarron High Plains 25i Llano Estacado 25j Shinnery Sands 25k Arid Llano Estacado | <p>26 Southwestern Tablelands</p> <ul style="list-style-type: none"> 26a Canadian/Cimarron Breaks 26b Flat Tablelands and Valleys 26c Caprock Canyons, Badlands, and Breaks 26d Semiarid Canadian Breaks <p>27 Central Great Plains</p> <ul style="list-style-type: none"> 27h Red Prairie 27i Broken Red Plains 27j Limestone Plains <p>29 Cross Timbers</p> <ul style="list-style-type: none"> 29b Eastern Cross Timbers 29c Western Cross Timbers 29d Grand Prairie 29e Limestone Cut Plain 29f Carbonate Cross Timbers | <p>30 Edwards Plateau</p> <ul style="list-style-type: none"> 30a Edwards Plateau Woodland 30b Llano Uplift 30c Balcones Canyonlands 30d Semiarid Edwards Plateau <p>31 Southern Texas Plains</p> <ul style="list-style-type: none"> 31a Northern Nueces Alluvial Plains 31b Semiarid Edwards Bajada 31c Texas-Tamaulipan Thornscrub 31d Rio Grande Floodplain and Terraces |
|--|---|--|



- Level III ecoregion
- Level IV ecoregion
- - - County boundary
- - - State boundary

- 32 Texas Blackland Prairies**
- 32a Northern Blackland Prairie
 - 32b Southern Blackland/Fayette Prairie
 - 32c Floodplains and Low Terraces
- 33 East Central Texas Plains**
- 33a Northern Post Oak Savanna
 - 33b Southern Post Oak Savanna
 - 33c San Antonio Prairie
 - 33d Northern Prairie Outliers
 - 33e Bastrop Lost Pines
 - 33f Floodplains and Low Terraces
- 34 Western Gulf Coastal Plain**
- 34a Northern Humid Gulf Coastal Prairies
 - 34b Southern Subhumid Gulf Coastal Prairies
 - 34c Floodplains and Low Terraces
 - 34d Coastal Sand Plain
 - 34e Lower Rio Grande Valley
 - 34f Lower Rio Grande Alluvial Floodplain
 - 34g Texas-Louisiana Coastal Marshes
 - 34h Mid-Coast Barrier Islands and Coastal Marshes
 - 34i Laguna Madre Barrier Islands and Coastal Marshes

- 35 South Central Plains**
- 35a Tertiary Uplands
 - 35b Floodplains and Low Terraces
 - 35c Pleistocene Fluvial Terraces
 - 35e Southern Tertiary Uplands
 - 35f Flatwoods
 - 35g Red River Bottomlands

Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Pistacia chinensis
Synonyms:	
Common names:	Chinese pistache
Evaluation date (mm/dd/yy):	07/05/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Originally assessed for the City of Austin Invasive Management Plan. There is a lack of information on Chinese Pistache therefore a majority of this assessment is based on local observations in Central Texas.

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	U	No Information
1.2	Impact on plant community	B	Observational
1.3	Impact on higher trophic levels	B	Observational
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

UBBD

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	A	Observational
2.2	Local rate of spread with no management	B	Observational
2.3	Recent trend in total area infested within state	U	No Information
2.4	Innate reproductive potential Wksht A	B	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
2.7	Other regions invaded	U	No Information

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

16

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	B	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

1.6

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	U No Information back
Identify ecosystem processes impacted:	
Sources of information: enter text here	
Question 1.2 Impact on plant community composition, structure, and interactions	B Observational back
Identify type of impact or alteration: Displaces native species and changes the understory structure of wooded areas.	
Sources of information: enter text here	
Observation: Gallo, T.	
Question 1.3 Impact on higher trophic levels	B Observational back
Identify type of impact or alteration:	
Outcompetes native vegetation and has potential to change structure of Oak-Juniper woodlands that the endangered golden-cheeked warbler depends on.	
Sources of information: enter text here	
Observational: T. Gallo	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
There is a native related species, <i>Pistacia mexicana</i> , but no known genetic hybridization.	
Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network: <i>Pistacia mexicana</i> . Accessed 5 July 2011: http://wildflower.org/plants/result.php?id_plant=PIME4 .	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Observational back
Describe role of disturbance: enter text here	
Can invade undisturbed forested areas.	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.2 Local rate of spread with no management	B Observational back
Describe rate of spread: no information	
Spreading but not greater than 10x	
Sources of information: enter text here	
Observation: T. Gallo	

Question 2.3 Recent trend in total area infested within state	U No Information back
Describe trend: no information	
Sources of information: enter text here	
Question 2.4 Innate reproductive potential	B Other Pub. Mat'l back
Describe key reproductive characteristics: Refer to Worksheet A	
Sources of information: Maino, E. and F, Howard. 1985. Ornamental trees: an illustrated guide to their selection and care. University of California Press, Los Angeles, CA. McWilliams E.D. and M.A. Arnold. 1998. Horticultural History Repeating Itself: Dispersal and the Invasion Lag Phase of Exotic Plants on the TAMU Campus. Proceedings of the 10 th Metropolitan Tree Improvement Alliance Conference held in St. Louis, MO.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here Very common plant sold at nurseries. Promoted as “Best Medium Size Shrub for Texas” by TexasAgrilife	
Sources of information: enter text here Texas Agrilife Texas Superstars. Chinese Pistache: Shade Tree Superstar For Texas. Accessed 05 July 11: http://aggie-horticulture.tamu.edu/cemap/pistache/pistachep.html . Observation: T. Gallo	
Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here Berries are readily spread long distances by birds.	
Sources of information: enter text here Klingaman, G. 2007. Plant of the Week. University of Arkansas Division of Agriculture. Accessed 05 July 11: http://www.arhomeandgarden.org/plantoftheweek/articles/chinese_pistache_11-30-07.htm . McWilliams E.D. and M.A. Arnold. 1998. Horticultural History Repeating Itself: Dispersal and the Invasion Lag Phase of Exotic Plants on the TAMU Campus. Proceedings of the 10 th Metropolitan Tree Improvement Alliance Conference held in St. Louis, MO.	
Question 2.7 Other regions invaded	U No Information back
Identify other regions: enter text here	
Sources of information: enter text here	
Distribution	
Question 3.1 Ecological amplitude/Range	B Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to	

<p>the state, if known: enter text here</p> <p>Refer to Worksheet B. There is very little information about the distribution of Chinese Pistache throughout TX. More information is needed to better answer this question.</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Observations (Accessed 11 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PICH4&cn=</p> <p>USDA PLANTS Database (Accessed 11 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=PICH4)</p>	
<p>Question 3.2 Distribution/Peak frequency</p>	<p>A Other Pub. Mat'l back</p>
<p>Describe distribution: enter text here</p> <p>Refer to Worksheet A</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Observations (Accessed 11 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PICH4&cn=</p> <p>USDA PLANTS Database (Accessed 11 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=PICH4)</p>	
<p>References</p> <p>List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). Websites should include the name of the organization and the date accessed. Personal communications should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.</p> <p>Examples:</p> <p>Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. Weed Technology. 9: 402-404.</p> <p>HEAR. Date unknown. Emex spinosa. Hawaiian Ecosystems at Risk. www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009</p> <p>DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.</p>	
<p>enter text here</p>	

Worksheet A

Reaches reproductive maturity in 2 years or less	0
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	Unknown
Viable seed produced with <i>both</i> self-pollination and cross-pollination	0
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	0
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	1
	5 1
	B
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crossttimbers	
		Western Crossttimbers	
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



TIPPC Plant Assessment Form

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Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Pyracantha coccinea
Synonyms:	Cotoneaster pyracantha (L.) Spach
Common names:	Scarlet Firethorn
Evaluation date (mm/dd/yy):	04/26/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Originally assessed for the City of Austin Invasive Management Plan. Do to largely no information about Pyracantha coccinea this is assessment is based largely on local observations in the Texas Hill Country.

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	U	No Information
1.2	Impact on plant community	B	2
1.3	Impact on higher trophic levels	C	2
1.4	Impact on genetic integrity	D	3

Impact

Enter four characters from Q1.1-1.4 below:

U B C D

Using matrix, determine score and enter below:

C

2.1	Role of anthropogenic and natural disturbance	A	2
2.2	Local rate of spread with no management	B	3
2.3	Recent trend in total area infested within state	B	2
2.4	Innate reproductive potential Wksht A	B	3
2.5	Potential for human-caused dispersal	A	3
2.6	Potential for natural long-distance dispersal	A	3
2.7	Other regions invaded	C	2

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

16

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	3
3.2	Distribution/Peak frequency Wksht C	A	3

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

2.15

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	U No Information back
Identify ecosystem processes impacted: It is unknown if there are any impacts on abiotic ecosystem processes.	
Sources of information: Gallo, observational	
Question 1.2 Impact on plant community composition, structure, and interactions	B Observational back
Identify type of impact or alteration: Pyracantha decreases biodiversity by out competing native plants in forest understory. Can change understory density by creating thickets.	
Sources of information: enter text here Observational,	
Question 1.3 Impact on higher trophic levels	C Observational back
Identify type of impact or alteration: Has thorns that can potentially injure wildlife and livestock. Birds readily eat berries.	
Sources of information: enter text here Personal Observation, Gallo.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here No related species.	
Sources of information: enter text here Waitt, D. 2011. Native Plant Information Network (Accessed 13 May 2011: http://wildflower.org/explore/).	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Observational back
Describe role of disturbance: enter text here Found in undisturbed forests in Central Texas.	
Sources of information: enter text here Personal Observation, Gallo	
Question 2.2 Local rate of spread with no management	B Other Pub. Mat'l back
Describe rate of spread: no information With no management Pyracantha will spread by birds to new locations.	
Sources of information: enter text here Floridata. 2005. Pyracantha coccinea. (Accessed 20 August 2010: http://www.floridata.com/ref/p/pyra_coc.cfm) Personal Observation, Gallo.	
Question 2.3 Recent trend in total area infested within state	B Observational back
Describe trend: no information	

<p>Seems pyracantha is not spreading at a rate of > doubling in 10yrs throughout the state, but is being reported in new areas of the state. It is commonly sold in Texas as a horticultural plant, and is being introduced to new locations throughout the state.</p>	
<p>Sources of information: enter text here</p> <p>Invaders of Texas Citizen Science Program (Accessed 13 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PYCO2&cn=).</p>	
<p>Question 2.4 Innate reproductive potential</p>	<p>B Other Pub. Mat'l back</p>
<p>Describe key reproductive characteristics:</p> <p>Refer to Worksheet A</p>	
<p>Sources of information:</p> <p>Pacific Island Ecosystems at Risk (PIER). 2004. <i>Pyracantha angustifolia</i>. Online @ http://www.hear.org/pier/wra/pacific/pyracantha_angustifolia_htmlwra.htm</p> <p>Hickman, JC (editor). 1993. <i>The Jepson Manual: Higher Plants of California</i> (Third Printing, with corrections). University of California Press, Berkeley. p. 972.</p>	
<p>Question 2.5 Potential for human-caused dispersal</p>	<p>A Other Pub. Mat'l back</p>
<p>Identify dispersal mechanisms: Plant sold at almost all nurseries and still commonly bought by consumers. Highly manicured plant in landscapes and landscapers spread berries as they transport the biomass from pruning. Commonly used in wreathes.</p>	
<p>Sources of information:</p> <p>Nesom, G.L. 2010. <i>Pyracantha</i> (Rosaceae) naturalized in Texas and the southeastern United States. <i>Phytoneuron</i> 2010-2: 1-6. (Accessed 26 April 2011).</p> <p>M. Gilmer. 2006. Berry-laden <i>Pyracantha</i> can be star of holiday décor. <i>Seattle pi</i>.</p> <p>Observational, Gallo.</p>	
<p>Question 2.6 Potential for natural long-distance dispersal</p>	<p>A Other Pub. Mat'l back</p>
<p>Identify dispersal mechanisms: Birds readily eat berries and disperse seeds.</p>	
<p>Sources of information:</p> <p>Floridata. 2005. <i>Pyracantha coccinea</i>. (Accessed 20 August 2010: http://www.floridata.com/ref/p/pyra_coc.cfm)</p>	
<p>Question 2.7 Other regions invaded</p>	<p>C Observational back</p>
<p>Identify other regions: Seems similar regions have been invaded.</p>	
<p>Sources of information: Invaders of Texas Citizen Science Program: http://texasinvasives.org/observations/mapping.php?search=Go&species=PYCO2 (Accessed 26 April 2011).</p>	

Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Program: Accessed 12 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PYCO2&cn= .	
USDA PLANTS Database: Accessed 12 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=PYCO2	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Program: Accessed 12 May 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=PYCO2&cn= .	
USDA PLANTS Database: Accessed 12 May 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=PYCO2	
References	
List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). Websites should include the name of the organization and the date accessed. Personal communications should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.	
Examples:	
Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. Weed Technology. 9: 402-404.	
HEAR. Date unknown. Emex spinosa. Hawaiian Ecosystems at Risk. www.hear.org/pier/species/emex_spinosa.htm . Accessed March 17, 2009	
DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.	
enter text here	

Worksheet A

Reaches reproductive maturity in 2 years or less	0
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	Unknown:0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	0
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	0
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	1
	5 1
	B

Note any related traits: enter text here

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crossttimbers	
		Western Crossttimbers	A
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	A
		Llano Uplift	A
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	C
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	C
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|--|---|--|
| <p>23 Arizona/New Mexico Mountains</p> <ul style="list-style-type: none"> 23a Chihuahuan Desert Slopes 23b Montane Woodlands <p>24 Chihuahuan Deserts</p> <ul style="list-style-type: none"> 24a Chihuahuan Basins and Playas 24b Chihuahuan Desert Grasslands 24c Low Mountains and Bajadas 24d Chihuahuan Montane Woodlands 24e Stockton Plateau <p>25 High Plains</p> <ul style="list-style-type: none"> 25b Rolling Sand Plains 25e Canadian/Cimarron High Plains 25i Llano Estacado 25j Shinnery Sands 25k Arid Llano Estacado | <p>26 Southwestern Tablelands</p> <ul style="list-style-type: none"> 26a Canadian/Cimarron Breaks 26b Flat Tablelands and Valleys 26c Caprock Canyons, Badlands, and Breaks 26d Semiarid Canadian Breaks <p>27 Central Great Plains</p> <ul style="list-style-type: none"> 27h Red Prairie 27i Broken Red Plains 27j Limestone Plains <p>29 Cross Timbers</p> <ul style="list-style-type: none"> 29b Eastern Cross Timbers 29c Western Cross Timbers 29d Grand Prairie 29e Limestone Cut Plain 29f Carbonate Cross Timbers | <p>30 Edwards Plateau</p> <ul style="list-style-type: none"> 30a Edwards Plateau Woodland 30b Llano Uplift 30c Balcones Canyonlands 30d Semiarid Edwards Plateau <p>31 Southern Texas Plains</p> <ul style="list-style-type: none"> 31a Northern Nueces Alluvial Plains 31b Semiarid Edwards Bajada 31c Texas-Tamaulipan Thornscrub 31d Rio Grande Floodplain and Terraces |
|--|---|--|



TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Triadica sebifera
Synonyms:	Croton sebiferum, Sapium sebiferum
Common names:	Chinese tallow tree
Evaluation date (mm/dd/yy):	07/08/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

<p>General comments on this assessment: Originally assessed for the City of Austin Invasive Management Plan</p>
--

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	B	Other Pub. Mat'l
1.2	Impact on plant community	A	Rev'd, Sci. Pub'n
1.3	Impact on higher trophic levels	B	Rev'd, Sci. Pub'n
1.4	Impact on genetic integrity	D	Other Pub. Mat'l

Impact

Enter four characters from Q1.1-1.4 below:

BABD

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	A	Rev'd, Sci. Pub'n
2.2	Local rate of spread with no management	A	Rev'd, Sci. Pub'n
2.3	Recent trend in total area infested within state	B	Rev'd, Sci. Pub'n
2.4	Innate reproductive potential Wksht A	A	Rev'd, Sci. Pub'n
2.5	Potential for human-caused dispersal	C	Observational
2.6	Potential for natural long-distance dispersal	A	Rev'd, Sci. Pub'n
2.7	Other regions invaded	C	Observational

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

16

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Moderate

No Alert

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

3.15

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	B Other Pub. Mat'l back
Identify ecosystem processes impacted:	
Dead leaves changes soil nutrients, raising the nitrogen and increasing tannin levels.	
Sources of information: enter text here	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas . IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
Rice, B. 1998. Weed Alert!: <i>Sapium sebiferum</i> . The Nature Conservancy, Wildland Invasive Species Team.	
Question 1.2 Impact on plant community composition, structure, and interactions	A Rev'd Sci. Pub'n back
Identify type of impact or alteration:	
Tallowtree creates monotypic stands outcompeting surrounding native vegetation. In Texas, tallowtree has changed coastal prairies into woodlands dominated by tallowtree.	
Sources of information: enter text here	
Bruce, K. A., Cameron, G. N., & Harcombe, P. A. (1995). Initiation of a new woodland type on the Texas coastal prairie by the Chinese tallow tree (<i>Sapium sebiferum</i> (L.) Roxb.). <i>Bulletin Of The Torrey Botanical Club</i> , 122(3), 215–225. Torrey Botanical Society. Retrieved from http://www.jstor.org/stable/2996086	
Jubinsky, G. and L. C. Anderson. 1996. The invasive potential of Chinese tallow-tree (<i>Sapium sebiferum</i> Roxb.) in the Southeast. <i>Castanea</i> 61:226-231	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas . IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
Rice, B. 1998. Weed Alert!: <i>Sapium sebiferum</i> . The Nature Conservancy, Wildland Invasive Species Team.	
Question 1.3 Impact on higher trophic levels	B Rev'd Sci. Mat'l back
Identify type of impact or alteration:	
Although a food source for some birds, it lowers the diversity of plant species and bird species.	
Sources of information: enter text here	
Bruce, K. A., Cameron, G. N., & Harcombe, P. A. (1995). Initiation of a new woodland type on the Texas coastal prairie by the Chinese tallow tree (<i>Sapium sebiferum</i> (L.) Roxb.). <i>Bulletin Of The Torrey Botanical Club</i> , 122(3), 215–225. Torrey Botanical Society. Retrieved from http://www.jstor.org/stable/2996086	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas . IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
Rice, B. 1998. Weed Alert!: <i>Sapium sebiferum</i> . The Nature Conservancy, Wildland Invasive Species Team.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
No similar species.	
Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 8 July 2011: http://wildflower.org/plants/	

Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Rev'd Sci. Mat'l back
Describe role of disturbance: enter text here	
Can invade undisturbed areas.	
Sources of information: enter text here	
Jubinsky, G. and L. C. Anderson. 1996. The invasive potential of Chinese tallow-tree (<i>Sapium sebiferum</i> Roxb.) in the Southeast. <i>Castanea</i> 61:226-231	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas . IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
Question 2.2 Local rate of spread with no management	A Rev. Sci. Pub'n back
Describe rate of spread: no information	
Has been shown to double in less than 10 years.	
Sources of information: enter text here	
Jubinsky, G. and L. C. Anderson. 1996. The invasive potential of Chinese tallow-tree (<i>Sapium sebiferum</i> Roxb.) in the Southeast. <i>Castanea</i> 61:226-231.	
Question 2.3 Recent trend in total area infested within state	B Rev'd Sci. Pub'n back
Describe trend: no information	
Tallow is continually invading new areas within the Coastal Prairies and riparian areas throughout the state.	
Sources of information: enter text here	
Rice University. "Chinese Tallow Tree Invades Texas Prairies." <i>ScienceDaily</i> , 25 Feb. 2002. Web. 8 Jul. 2011.	
Observation: T. Gallo	
Question 2.4 Innate reproductive potential	A Rev'd Sci. Mat'l back
Describe key reproductive characteristics:	
Refer to Worksheet A	
Sources of information:	
Renne, I. J., Gauthreaux, S. A., & Gresham, C. A. (2000). Seed dispersal of the Chinese tallow tree (<i>Sapium sebiferum</i> (L.) Roxb.) by birds in coastal South Carolina. <i>American Midland Naturalist</i> , 144(1), 202-215.	
Jubinsky, G. and L. C. Anderson. 1996. The invasive potential of Chinese tallow-tree (<i>Sapium sebiferum</i> Roxb.) in the Southeast. <i>Castanea</i> 61:226-231.	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas . IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
Rice, B. 1998. Weed Alert!: <i>Sapium sebiferum</i> . The Nature Conservancy, Wildland Invasive Species Team.	
Question 2.5 Potential for human-caused dispersal	C Observational back
Identify dispersal mechanisms: enter text here	
Tallowtree is on the Texas Noxious Weed list and is not significantly being dispersed by humans. Although it is commonly planted in landscapes and berries fall into the beds on vehicles and can be dispersed this way.	
Sources of information: enter text here	
Observation: T. Gallo	

Question 2.6 Potential for natural long-distance dispersal	A Rev'd Sci. Pub'n back
Identify dispersal mechanisms: enter text here	
Birds carry seeds far distances. Seeds are also dispersed by water during flood events.	
Sources of information: enter text here	
Renne, I. J., Gauthreaux, S. A., & Gresham, C. A. (2000). Seed dispersal of the Chinese tallow tree (<i>Sapium sebiferum</i> (L.) Roxb.) by birds in coastal South Carolina. <i>American Midland Naturalist</i> , 144(1), 202-215.	
Jubinsky, G. and L. C. Anderson. 1996. The invasive potential of Chinese tallow-tree (<i>Sapium sebiferum</i> Roxb.) in the Southeast. <i>Castanea</i> 61:226-231.	
Langeland, K.A. and K. Craddock Burks. 1998. Identification and Biology of Non-Native Plants in Florida's Natural Areas . IFAS Publication SP 257. University of Florida, Gainesville. 165 pp.	
Rice, B. 1998. Weed Alert!: <i>Sapium sebiferum</i> . The Nature Conservancy, Wildland Invasive Species Team.	
Question 2.7 Other regions invaded	C Observational back
Identify other regions: enter text here	
Most regions have been invaded	
Sources of information: enter text here	
Observation: T. Gallo	
Distribution	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 6 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=TRSE6&cn=	
USDA PLANTS Database (Accessed 6 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=TRSE6)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 6 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=TRSE6&cn=	
USDA PLANTS Database (Accessed 6 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=TRSE6)	

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	1
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	1
Seeds remain viable in soil for three or more years	0
Viable seed produced with <i>both</i> self-pollination and cross-pollination	1
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	1
Fragments easily and fragments can become established elsewhere	0
Resprouts readily when cut, grazed, or burned	1
	8 1
	A
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crossttimbers	A
		Western Crossttimbers	
		Grand Prairie	A
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	A
		Llano Uplift	A
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	A
		Southern Blackland/Fayette Prairie	A
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	A
		Southern Post Oak Savanna	A
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	A
		Southern Subhumid Gulf Coastal Prairies	A
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	A
		Mid-Coast Barrier Islands and Coastal Marshes	A
Laguna Madre Barrier Islands and Coastal Marshes	A		
ER12	South Central Plains	Tertiary Uplands	A
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	A
		Flatwoods	A
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains | 31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces |
| 25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



- | | |
|--|---|
| 32 Texas Blackland Prairies
32a Northern Blackland Prairie
32b Southern Blackland/Fayette Prairie
32c Floodplains and Low Terraces | 33 East Central Texas Plains
33a Northern Post Oak Savanna
33b Southern Post Oak Savanna
33c San Antonio Prairie
33d Northern Prairie Outliers
33e Bastrop Lost Pines
33f Floodplains and Low Terraces |
| 34 Western Gulf Coastal Plain
34a Northern Humid Gulf Coastal Prairies
34b Southern Subhumid Gulf Coastal Prairies
34c Floodplains and Low Terraces
34d Coastal Sand Plain
34e Lower Rio Grande Valley
34f Lower Rio Grande Alluvial Floodplain
34g Texas-Louisiana Coastal Marshes
34h Mid-Coast Barrier Islands and Coastal Marshes
34i Laguna Madre Barrier Islands and Coastal Marshes | 35 South Central Plains
35a Tertiary Uplands
35b Floodplains and Low Terraces
35c Pleistocene Fluvial Terraces
35e Southern Tertiary Uplands
35f Flatwoods
35g Red River Bottomlands |

Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

TIPPC Plant Assessment Form

For use with “[Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands](#)”
by the California Invasive Plant Council and the Southwest Vegetation Management Association

Version February 2003, modified July 2009 for the Texas Invasive Plant & Pest Council –
www.texasinvasives.org

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Cyrtomium falcatum
Synonyms:	Polystichum falcatum (L. f.) Diels
Common names:	Japanese netvein hollyfern
Evaluation date (mm/dd/yy):	07/11/2011
Evaluator #1 Name/Title:	Travis Gallo/Ecologist
Affiliation:	The Lady Bird Johnson Wildflower Center
Phone numbers:	512-232-0116
Email address:	tgallo@wildflower.org
Address:	4801 La Crosse Ave., Austin, Texas 78704
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Originally assessed for the City of Austin Invasive Management Plan

There is little to no information about Holly ferns invasiveness. This overall assessment should actually be rated as an “Unknown”. And the City of Austin should monitor this species to better understand its impact.

Table 2. Criteria, Section, and Overall Scores

Species: enter text here

Region: enter text here

1.1	Impact on abiotic ecosystem processes	U	No Information
1.2	Impact on plant community	A	Observational
1.3	Impact on higher trophic levels	U	No Information
1.4	Impact on genetic integrity	D	Observational

Impact

Enter four characters from Q1.1-1.4 below:

UAUD

Using matrix, determine score and enter below:

B

2.1	Role of anthropogenic and natural disturbance	A	Observational
2.2	Local rate of spread with no management	B	Observational
2.3	Recent trend in total area infested within state	U	No Information
2.4	Innate reproductive potential Wksht A	U	No Information
2.5	Potential for human-caused dispersal	A	Observational
2.6	Potential for natural long-distance dispersal	A	Other Pub. Mat'l
2.7	Other regions invaded	U	No Information

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

10

Use matrix to determine score and enter below:

C

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

**Low
No Alert**

3.1	Ecological amplitude/Range	A	Other Pub. Mat'l
3.2	Distribution/Peak frequency Wksht C	A	Other Pub. Mat'l

Distribution

Using matrix, determine score and enter below:

A

Documentation

Average of all questions

1.14

Table 3. Documentation (List all references at end of PAF. Short citations may be used in Table 3.)

Impacts	
Question 1.1 Impact on abiotic ecosystem processes	U No Information back
Identify ecosystem processes impacted:	
Sources of information: enter text here	
Question 1.2 Impact on plant community composition, structure, and interactions	A Other Pub. Mat'l back
Identify type of impact or alteration:	
Displaces native vegetation.	
Sources of information: enter text here	
Ruckstuhl, E. Dirty Dozens: Holly Fern. Bayou Preservation Association. Accessed 11 July 2011: http://www.bayoupreservation.org/html/BPA_exotics.pdf	
Question 1.3 Impact on higher trophic levels	U No Information back
Identify type of impact or alteration:	
Sources of information: enter text here	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: enter text here	
No native species of Cyrtomium	
Sources of information: enter text here	
Waitt, D. 2011. Native Plant Information Network. Accessed 6 July 2011: http://wildflower.org/plants/	
Invasiveness	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	A Observational back
Describe role of disturbance: enter text here	
Can invade undisturbed areas.	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.2 Local rate of spread with no management	B Observational back
Describe rate of spread: no information	
Increasing but not rapidly.	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.3 Recent trend in total area infested within state	U No Information back
Describe trend: no information	

Sources of information: enter text here	
Question 2.4 Innate reproductive potential	U No Information back
Describe key reproductive characteristics:	
Sources of information:	
Question 2.5 Potential for human-caused dispersal	A Observational back
Identify dispersal mechanisms: enter text here	
Commonly sold as house plants and other ornamental purposes.	
Sources of information: enter text here	
Observation: T. Gallo	
Question 2.6 Potential for natural long-distance dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: enter text here	
Spores can be carried by water and wind.	
Sources of information: enter text here	
Ruckstuhl, E. Dirty Dozens: Holly Fern. Bayou Preservation Association. Accessed 11 July 2011: http://www.bayoupreservation.org/html/BPA_exotics.pdf	
Question 2.7 Other regions invaded	U No Information back
Identify other regions: enter text here	
Sources of information: enter text here	
Distribution	
Question 3.1 Ecological amplitude/Range	B Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: enter text here	
Refer to Worksheet B. There is not enough information to accurately discuss distribution.	
Sources of information: enter text here	
Invaders of Texas Citizen Science Observations (Accessed 11 July 2011: http://texasinvasives.org/observations/search.php?satellite=&sn=CYFA2&cn=	
USDA PLANTS Database (Accessed 8 July 2011: http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=CYFA2)	
Question 3.2 Distribution/Peak frequency	A Other Pub. Mat'l back
Describe distribution: enter text here	
Refer to Worksheet B. There is not enough information to accurately discuss distribution.	

Sources of information: enter text here

Invaders of Texas Citizen Science Observations (Accessed 11 July 2011:
<http://texasinvasives.org/observations/search.php?satellite=&sn=CYFA2&cn=>

USDA PLANTS Database (Accessed 8 July 2011:
http://plants.usda.gov/java/county?state_name=Texas&statefips=48&symbol=CYFA2)

References

List full citations for all references used in the PAF (short citations such as DiTomaso and Healy 2007 may be used in table above). **Websites** should include the name of the organization and the date accessed. **Personal communications** should include the affiliation of the person providing the observation. Enter each reference on a separate line; the table will expand as needed.

Examples:

Mitich, L. W. 1995. Intriguing world of weeds: Tansy ragwort. *Weed Technology*. 9: 402-404.

HEAR. Date unknown. *Emex spinosa*. Hawaiian Ecosystems at Risk.
www.hear.org/pier/species/emex_spinosa.htm. Accessed March 17, 2009

DiTomaso, J. M. Personal communication from Dr. Joe DiTomaso, Dept. of Plant Science, UC Davis. Email received 3/17/09.

enter text here

Worksheet A

Reaches reproductive maturity in 2 years or less	Unknown
Dense infestations produce >1,000 viable seed per square meter	2
Populations of this species produce seeds every year.	1
Seed production sustained over 3 or more months within a population annually	Unknown
Seeds remain viable in soil for three or more years	Unknown
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Unknown
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Unknown
Fragments easily and fragments can become established elsewhere	Unknown
Resprouts readily when cut, grazed, or burned	1
	4 6
	U
Note any related traits: enter text here	

Notes for Worksheet B - Texas Ecoregions

Question 3.1

Ecological amplitude

Refer to the worksheet and select the one letter below that indicates the number of different ecological types that this species invades in your state.

- A. Widespread—the species invades at least three Level III ecoregions **or** at least 22 Level IV ecoregions.
- B. Moderate—the species invades two Level III ecoregions 8 Level IV ecoregions.
- C. Limited—the species invades only one Level III ecoregion **and** two to six Level IV ecoregions.
- D. Narrow—the species invades only one Level IV ecoregion.
- U. Unknown.

Worksheet B - Texas Ecoregions (Griffen et al, 2004).

* A. means >50% of type occurrences are invaded; B means >20% to 50%;
 C. means >5% to 20%; D. means present but ≤5%; U. means unknown

Code	Level III	Level IV	Score
ER01	Arizona/New Mexico Mountains	Chihuahuan Desert Slopes	
		Montane Woodlands	
ER02	Chihuahuan Deserts	Chihuahuan Basins and Playas	
		Chihuahuan Desert Grasslands	
		Low Mountains and Bajadas	
		Chihuahuan Montane Woodlands	
		Stockton Plateau	
ER03	High Plains	Rolling Sand Plains	
		Canadian/Cimarron High Plains	
		Llano Estacado	
		Shinnery Sands	
		Arid Llano Estacado	
ER04	Southwestern Tablelands	Canadian/Cimarron Breaks	
		Flat Tablelands and Valleys	
		Caprock Canyons, Badlands, and Breaks	
		Semiarid Canadian Breaks	
ER05	Central Great Plains	Red Prairie	
		Broken Red Plains	
		Limestone Plains	
ER06	Cross Timbers	Eastern Crosstimbers	
		Western Crosstimbers	
		Grand Prairie	
		Limestone Cut Plain	
		Carbonate Cross Timbers	
ER07	Edwards Plateau	Edwards Plateau Woodland	
		Llano Uplift	
		Balcones Canyonlands	A
		Semiarid Edwards Plateau	
ER08	Southern Texas Plains	Northern Nueces Alluvial Plains	
		Semiarid Edwards Bajadas	
		Texas-Tamaulipan Thornscrub	
		Rio Grande Floodplain and Terraces	
ER09	Texas Blackland Prairies	Northern Blackland Prairies	
		Southern Blackland/Fayette Prairie	
		Floodplains and Low Terraces	
ER10	East Central Texas Plains	Northern Post Oak Savanna	
		Southern Post Oak Savanna	
		San Antonio Prairie	
		Northern Prairie Outliers	
		Bastrop Lost Pines	
		Floodplains and Low Terraces	
ER11	Western Gulf Coastal Plain	Northern Humid Gulf Coastal Prairies	A
		Southern Subhumid Gulf Coastal Prairies	
		Floodplains and Low Terraces	
		Coastal Sand Plain	
		Lower Rio Grande Valley	
		Lower Rio Grande Alluvial Floodplain	
		Texas-Louisiana Coastal Marshes	
		Mid-Coast Barrier Islands and Coastal Marshes	
Laguna Madre Barrier Islands and Coastal Marshes			
ER12	South Central Plains	Tertiary Uplands	
		Floodplains and Low Terraces	
		Pleistocene Fluvial Terraces	
		Southern Tertiary Uplands	
		Flatwoods	
		Red River Bottomland	

Ecoregions of Texas

- | | | |
|---|---|--|
| 23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands | 26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks | 30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau |
| 24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau | 27 Central Great Plains
27h Red Prairie
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27j Limestone Plains | 31 Southern Texas Plains
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31b Semiarid Edwards Bajada
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| 25 High Plains
25b Rolling Sand Plains
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25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado | 29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers | |



Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.

***Bothriochloa ischaemum var. songarica*** (King Ranch bluestem)

SUMMARY

Rating	Alert	Impact	Invasiveness	Distribution	Documentation
Not listed	N	B	B	U	2

Comments: Plant Score was not calculated because the guidelines do not contain scoring guidelines for the situation where the distribution score is 'U'.

A Documentation average is requested but the guidelines do not contain information for quantifying it.

Rating:

1 = High
2 = Moderate
3 = Limited
4 = Evaluated, not listed

Alert:
Y = Yes
N = No

Scores:

A = Severe
B = Moderate
C = Limited
D = None
U = Unknown

Documentation:

4 = Reviewed scientific publications
3 = Other published material
2 = Observational
1 = Anecdotal
0 = No information

SUMMARY

1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2
B	A	U	C	A	C	D	B	A	D	A	U	U

IMPACT

1.1 Impact on abiotic ecosystem processes - B

Identify ecosystem processes impacted: compared to native grassland species: above-ground biomass greater, litter accumulation greater, hence soil temperature likely lower ; likely effects on fire intensity, etc.; possible effects on nitrogen cycle; might increase (due to shading) or decrease (due to uptake) soil moisture.

Source: pers. obs; T. Basham pers. comm.; T. Basham dissertation, when completed, will address many of these processes

Documentation: Observational

1.2 Impact on plant community composition, structure, and interactions - A

Identify type of impact or alteration: compared to plots dominated by native grassland species, species richness can be greatly reduced. near-monocultures of *B. ischaemum var songarica* are not uncommon.

Source: Gabbard and Fowler 2007

Documentation: Rev'd, Sci. Pub'n

1.3 Impact on higher trophic levels - U

Identify type of impact or alteration: unknown, but probably large where *B. ischaemum var songarica* is abundant

Source: Sources of information: none, but note that published studies of *B. ischaemum var ischaemum* further north have documented impacts

Documentation: No Information

1.4 Impact on genetic integrity - C

Identify impacts: according to anecdotal information, it may self-fertilize or be an apomict, and may be an aneuploid series

Source: D. Overath is working on the genetics of this species; Gould 1975 reports several chromosome numbers for this variety, which suggests aneuploidy and hence apomixis. There are native congeners, so the risk should be investigated

Documentation: Anecdotal

INVASIVENESS

2.1 Role of anthropogenic and natural disturbance in establishment - A

Describe role of disturbance: highly fire, grazing, and mowing tolerant, but does not need any of these to form dense monocultures; not restricted to roadsides but often abundant there

Sources of information: Fowler and Gabbard 2007; Fowler unpublished

2.2 Local rate of spread with no management - C

Describe rate of spread: relatively slow; primarily spreading from established patches

Source: Fowler unpublished

2.3 Recent trend in total area infested within state - D

Describe trend: my guess is that it continues to increase

Source: conversations with land managers; casual pers. obs

2.4 Innate reproductive potential - B

Describe key reproductive characteristics: bunchgrass; sets abundant seed, but seed viability often fairly low, apparently due to fungus

Source: Gabbard 2003 (Ph.D. dissertation) provides excellent demographic data on this species; Alofs unpublished.

2.5 Potential for human-caused dispersal - A

Identify dispersal mechanisms: vehicles; mowing machines are likely. Note that it is sold commercially and deliberately planted, especially for erosion control.

Sources of information: Gabbard and Fowler 2007

2.6 Potential for natural long-distance dispersal - D

Identify dispersal mechanisms: none known

Sources of information: the pattern of local spread (Fowler unpublished) strongly suggests that natural dispersal is usually limited to quite short distances; does not stick in socks but might be moved by mud on hooves, paws

2.7 Other regions invaded - A

Identify other regions: based on Turner 2003, this variety has already spread across the southern half of Texas, suggesting a climatic limit. *B. ischaemum* var *ischaemum* is found in OK, KA, so we can anticipate it spreading across northern TX

Sources of information: Turner 2003

Invasiveness: A C D B A D A = B

DISTRIBUTION

3.1 Ecological amplitude - U

Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: we have information only for the eastern Edwards Plateau. In that region, the amplitude would score 'A'

Sources: for the eastern Edwards Plateau only: Gabbard and Fowler 2007; Fowler unpublished; pers comm. from various land managers

Documentation: No Information

3.2 Impact on plant community composition, structure, and interactions - U

Identify type of impact or alteration:

Sources:

Documentation: No Information

ECOREGIONS

ER01	ER02	ER03	ER04	ER05	ER06	ER07	ER08	ER09	ER10
U	U	U	U	U	U	U	U	U	U
Key			Score						
ER01 - East Texas Pineywoods			A. >50% of type occurrences are invaded						
ER02 - Gulf Coast Prairies and Marshes			B. >20% to 50%						
ER03 - Post Oak Savannah			C. >5% to 20%						
ER04 - Blackland Prairies			D. present but <=5%						
ER05 - Cross Timbers and Prairies			U. means unknown						
ER06 - South Texas Plains									
ER07 - Edwards Plateau									
ER08 - Rolling Plains									
ER09 - High Plains									
ER10 - Tran Pecos									

EVALUATORS - 2009-10-04

Evaluator 01		Evaluator 02
Norma Fowler		
University of Texas at Austin		
512-471-1295		
nfowler@uts.cc.utexas.edu		
Section of Integrative Biology C0930, University of Texas, 1 University Station, Austin, TX 78712		



City of Austin Invasive Species Management Plan

Appendix G



**Parkland (PARD) Brush Management Guidelines,
for Invasive Species Removal Projects
City of Austin, TX
11/21/2011**

Invasive species management will continue and, in some cases, increase on Austin parkland. A brush management plan is essential for every invasive species removal project. The following brush management guidelines were created to address potential wildfire threats due to continued severe drought and abnormally dry conditions in parks and greenbelts across Austin and should be incorporated into brush management plans.

Brush created by cutting or pulling invasive plant species should be treated in one of three ways, in order of preference due to wildfire threat reduction – 1) Chip, 2) Haul, 3) Windrows and Scattering. Below, each is explained in detail:

1) Chip it - If it is possible to get brush chippers on-site, the top preference is to chip up all cut brush, trunks and tree pieces and to spread the mulch out as evenly as possible. Chippers can be operated by city staff or authorized vendors working under contract to non-profit partner groups or fiduciary groups operating under their charitable umbrellas.

If invasive species propagative plant material (i.e. seeds, berries) is present during the invasive species removal project, another method should be utilized, if possible

2) Haul it off - If there is too much brush or a chipper isn't available, the second preference is to haul it off and get it chipped up or recycled in another way. This step assumes that brush can be picked up by City Forestry staff or Parks staff using brush trucks or trailers and that there is access to the site for such vehicles. In non-accessible areas, this isn't an option, thus a combination of #1 and #3 is the recommended solution.

If invasive species propagative plant material (i.e. seeds, berries) is present during the invasive species removal project, this is the best method to utilize

3) Windrows and Scattering. If the site is inaccessible (for example, along a greenbelt with no vehicle access, thus making chipping or hauling impossible), then windrowing and scattering brush should be utilized. This ensures that there is little chance of a fire getting started and if it did, minimizing the spread and overall effect.

a. Windrows.

i. Windrows should be in shorter segments, separated by a gap or space that is three times the height and width of the windrow. For example, if the windrow is 1 foot high and 1 foot wide, the gap between windrows should be at least 3 Feet.

ii. Generally, 20 feet is the ideal length for a windrow.

iii. Windrows should be located in open areas, not next to or touching tree trunks or in denser tree canopy(s), if possible

iv. If the above cannot be accomplished, use the brush break-up and scattering method

b. Brush Scattering - If working in a more enclosed canopy, breaking up the brush into shorter, non-branching lengths (1 foot or so) and scattering the broken up pieces evenly across the ground is the most effective way to deal with the brush, mimicking conditions of the natural forest floor, much like nature does with leaves, dead limbs, shrubs and trees.

c. Site Specificity by Method - In places where erosion control is important, such as strongly sloping inclines, windrows are best even in a densely forested canopy, especially where plants are not holding the soil together. To control erosion, orient windrows perpendicular to the slope.

Generally, the areas where Windrows and Scattering are going to be used the most are along trails and greenbelts in riparian (water edge) environments where the chance of fire is much lower than in more accessible parks and trails.

If invasive species propagative plant material (i.e. seeds, berries) is present during the invasive species removal project, another method should be utilized.

Compiled by Charlie McCabe, Austin Parks Foundation, cmccabe@austinparks.org

Based on communication with Walter Passmore, Austin Urban Forestry Program Manager; Glee Ingram, Greenbelt Guardians; and John Cook, PARD Staff, Fall 2011.

Modified by Angela Hanson for the Invasive Species Management Plan, Fall 2011.



City of Austin Invasive Species Management Plan

Appendix H



Vegetation Treatment and Removal Pricing			
Woody Species	Initial Visit Price ^{1, *}	Secondary Visit (if required)	Herbicide Application (only) ^{2, *}
Tree Size (in.)			
1 - 3"	\$50.00	-	\$10.00
3 - 5"	\$100.00	-	\$10.00
5 - 8"	\$150.00	-	\$10.00
Shrub and Herbaceous Species	Initial Visit Price ^{3, *}	Secondary Visit (if required) ^{4, *}	Herbicide Application (only) ^{5, *}
Square Footage (sq. ft.)			
0 - 10,000	\$0.35 per sq. ft.	\$0.10 per sq. ft.	\$0.10 per sq. ft.
10,000 - 30,000	\$0.25 per sq. ft.	\$0.10 per sq. ft.	\$0.10 per sq. ft.
30,000+	\$0.17 per sq. ft.	\$0.10 per sq. ft.	\$0.10 per sq. ft.

¹ Price includes cutting, treating and removal of all invasive species per tree.

² Price includes cutting the tops of all stumps and applying herbicide to all invasive woody vegetation. Based on the number of stumps.

³ Price includes cutting, raking, treating and removal of all invasive herbaceous vegetation/shrubbery.

⁴ Price includes cutting the tops of all unwanted vegetation and applying herbicide to all invasive herbaceous vegetation/shrubbery. Square footage will be based on infested area only.

⁵ Price includes cutting the tops of all unwanted vegetation and applying herbicide to all invasive shrubbery. Square footage will be based on area that needs to be treated only.

* \$100.00 minimum per trip