

Risk Assessment: Criteria for Categorizing Invasive Non-Native Plants That Threaten Wildlands

California Exotic Pest Plant Council
Southwest Vegetation Management Association
University of Nevada Cooperative Extension



What's the Program?

- Preamble
 - Brief Description of Project
 - Players
 - Definitions of Terms
- Perspective
- Process
- Protocols and Other Products

Brief Description of Project

- **Document** - Paper copy and web-based
- **Criteria** -
 - transparent, evaluative, decision-making process
 - “cookbook” for ranking invasive non-native plant species through assessments of individual species for:
 - ecological impacts
 - attributes of invasiveness
 - ecosystems invaded
- **Purpose** - primarily to develop or revise lists of non-native plant species invasive in wildlands

Preamble: PLAYERS I

ORGANIZATIONS

- CALEPPC
- SOUTHWEST VEGETATION MANAGEMENT ASSOCIATION
- UNIV. OF NEVADA COOPERATIVE EXTENSION

PLAYERS II

AUTHORS OF CRITERIA

Joe DiTomaso, Alison Stanton, John Randall,
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CONTRIBUTORS AND REVIEWERS

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Bob Adams

PLAYERS III

■ INDIVIDUAL REPORTERS

Maria Alvarez, Peter Baye, Brad Burkhart, Peter Connors, Kim Cooper, John Copeland, Tom Echols, Echols, Barbara Errtter, Karen Gaffney, Clare Golec, Golec, Tim Hyland, Mike Kelly, Bill Neill, Ingrid Parker, Arnie Peterson, Andrea Pickart, Jane Rodgers, Rodgers, Peter Sarafian, Teresa Sholars, Kerry Eastman Stendell, Georgia Stigall, and many others....
others....

Preamble: Definitions I

KEEP THE CONTEXT OF *INVASIVE NON-NATIVE SPECIES* AND *WILDLAND COMMUNITIES AND ECOSYSTEMS* IN MIND ...

- risk assessment - a process through which to assess the costs or liabilities of an event or occurrence according to standard criteria
- criteria - questions that facilitate the evaluation of available factual information as objectively as possible

Definitions II

SO, WHAT'S THE *CONTEXT* AGAIN?

- non-native - describing a species or ecotype that has not evolved in a given ecosystem
- invasive - characteristic of a species or population that is established, self-sustaining, and expanding beyond its native (evolutionarily historical) range
- wildland - any public or private area, including land and water, that supports native ecosystems

Definitions III

AND WHERE DOES RISK ASSESSMENT LEAD?

- Ranking - a listing based on a standard assessment or scoring system that communicates a relative level of risk
- Categorizing - a ranking system that groups its elements (i.e., invasive plant species) according to scoring ranges, geographical or regional distribution, or other defined criteria

What's the Program?

- Preamble
- Perspective
 - History of the CalEPPC “Weed List”
 - Impetus for Criteria-based Ranking Protocols
- Process
- Protocols and Other Products

Perspective: The CalEPPC “Weed List”

■ History I

- Inspiration: Ann Howald (ca. 1993)
- Board embraces “weed list” idea (ca. 1994) with notable support from Nelroy Jackson
- Original List Committee: Ann Howald (DFG), John Randall (TNC), Jake Sigg (CNPS)
- Committee compiled information from agencies, land managers, researchers, et al., on ecological weeds

Perspective: The CalEPPC “Weed List”

■ History II

- Ranked list of weeds reviewed by contributors and other experts
- First published in 1996
- Committee expanded in 1998: Ellie Wagner (CalTrans), Peter Warner (invasive East Coaster)
- First revision published in 1999

Perspective: The CalEPPC “Weed List”

History III

Intentions, Considerations, and a Lesson

- provide CalEPPC publicity - success!
- fulfill CalEPPC mission to educate about invasive plant species - success again!!
- wildland weeds only - not agricultural pest plants
- sublists: differences in extent of impacts, species distributions, ecosystems affected
- provided for review, comment, and contributions
- Lesson: “Need More Information” characteristic of many species

Perspective: Impetus for Criteria-based Ranking Protocols

- **“Weed List” has become quasi-regulatory**
 - management plans, CC&Rs, environmental compliance documents, etc.
 - questions about decision-making process for listing and categorizing non-native plants
 - CalEPPC Board recognized need for supporting documentation on weed impacts, biology, management, and other issues
- **CalEPPC Board: more than its share of masochists with too much time on their hands**

What's the Program?

- Preamble
- Perspective
- Process
 - Weed-Rating Systems: Review & Adoption
 - Goals of This Criteria System
 - Supporting Information
 - Intended Uses & Other Considerations
- Protocols and Products

Weed Rating Systems

- **Review** of existing evaluative & ranking schemes as potential *templates* or *models*
 - NPS (Hiebert & Stubbendieck 1993)
 - TNC (Randall, Morse, Benton, Davis 2002)
 - Univ. of Florida Extension (Fox et al. 2000)
- **Adoption** of TNC Criteria as model
 - emphasis on impacts, invasive characteristics
 - scoring regime compatible with CalEPPC List
 - similar goals and applications for criteria

Goals of This Criteria-based System

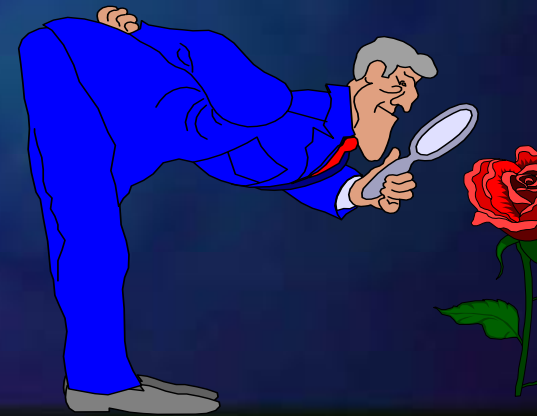
- **Production** of objective, scientifically defensible, transparent criteria-based protocols for evaluation of weed impacts and subsequent categorical ranking
- **Education** about ranking & invasive species
- **Compilation** of available reference & management information
- **Facilitation** of contributions of data & documentation for weed list revisions

Supporting Information

- **Instructions, Definitions, & Descriptions**
 - clear instructions for use
 - instructions & forms for scoring & ranking
 - terms used in document
 - descriptions of ranking categories and
 - ecological community types
- **References**
 - published research & journal articles
 - data & reports, anecdotes

Intended Uses for the Criteria

- To generate lists of *established* invasive non-native plant species - state, regional, etc.
- To provide relative ranking → categories
- To inform and educate land managers, legislators, nursery growers, consultants, Weed Management Area groups, et al. about the evaluation & ranking process
- To identify research needs and data gaps



Other Considerations

- **Caveats, Exceptions, Excuses...**
 - will not evaluate economic impacts
 - will not consider management challenges, costs
 - lists will not include predominantly agricultural weeds
- **General Denial & CYA Disclaimers:**
The criteria and weed lists...
 - are not intended for legal or regulatory use
 - are not intended as a pre-screening tools to exclude species not yet introduced to a given state or region
 - will be regularly re-evaluated and revised

What's the Program?

- Preamble
- Perspective
- Process
- Protocols and Products
 - Criteria Protocols
 - General Information
 - Sections, Questions, and Sub-Rank Scoring
 - Composite Scoring and Ranking
 - Objectives: Products & Results

Criteria Protocols - General Information

- Scoring sheets provided for responses, subranking, ranking
- In each of 3 sections, responses to questions are referenced in a scoring matrix *or* awarded points to determine the species' subrank for that section
- Each response can be supplemented with comments, reference citations, supportive evidence, or data
- The three subranks will determine the composite (overall) rank (= List category) according to a category matrix
- Resulting lists of invasive species will be organized categorically by composite ranks
- Lists will provide subrank (section) scores

Criteria Protocol Sections

- I. **Impact on Native Species, Communities, and Ecosystem Processes**
- II. **Invasive Potential:** Potential to establish, spread, and increase in abundance in wildlands
- III. **Ecological Amplitude and Distribution:**
Number and Percentages of Different Ecological Types Invaded
- IV. **Overall Ranking Procedure**
- V. **Ranking of Documentation**

I. Impact on Native Species, Communities, and Ecosystem Processes

- 1) Questions: (hierarchical arrangement)
 - 1) Abiotic system processes
 - 2) Biotic community composition and interactions
 - 3) Vegetation structure
 - 4) Genetic integrity
- 2) Subrank scoring: based on combination of 4 responses and positions in matrix (table)

II. Invasive Potential

1) Questions:

- 1) Role of disturbance in establishment
- 2) Rate of spread in the absence of management
- 3) Recent trend of change in total range
- 4) Innate reproductive potential
- 5) Potential for human-caused dispersal
- 6) Potential for natural long-distance dispersal
- 7) Other regions invaded

2) Subrank scoring: based on response scores (A=3, B=2, C=1, D=0) to a minimum of 5 questions; total score determines subrank

III. Ecological Amplitude and Distribution

- 1) Major and minor “ecological types” (aquatic, terrestrial) provided in a table (by state)
- 2) Questions:
 - 1) number of types invaded
 - 2) proportions of each invaded
- 3) Subrank scoring: based on combination of 2 responses and positions in matrix (table)

Section IV. Overall Ranking Procedure

[Ranking is Determined Chiefly by *IMPACTS*]

Impacts	Invasive Potential	Ecological Amplitude	List Category
A	A-B	A-B	SEVERE
A	A-B	C-D	RED ALERT
A	C-D	A-D	MODERATE
B	A-B	A-B	MODERATE
B	A-B	C-D	RED ALERT
B	C-D	A-D	LOW
C	A	A-B	MODERATE
C	A	C-D	LOW
C	B	A	MODERATE
C	B	B-D	LOW

Section V. Ranking of Documentation

- A. High** Published, peer-reviewed scientific research, data, reviews
- B. Moderate** Non-peer reviewed book chapters, proceedings, newsletters
- C. Low** Unpublished observations, confirmed by qualified biologists
- D. Poor** Unconfirmed anecdotal observations
- E. Unknown** Documentation lacking

Proposed CalEPPC Sub-Lists for “Invasive Non-Native Plants List”

List A	Severely invasive
List B	Moderately invasive
List C	Less invasive
Red Alert!	Severe to moderate impacts or invasiveness, <i>and</i> limited ecological amplitude
Evaluated - Not Listed	Generally insignificant impacts, other attributes notwithstanding

Objectives: Products & Results

- Published and internet available:
 - Criteria Protocols and Scoring Form
 - Revised “Invasive Non-Native Plants” List
 - Invasive plant reporting and nomination form
- Database of References & Information
- CalEPPC News - articles, reports
- Management Database
- Regional Invasive Plants Lists

Summary: The Listing Process

- Prioritization for review of existing “Weed List” species and new nominations
- Compilation of documentation on species: research articles, reports, data
- Committee review of available data
- Application of Criteria to each species
- Revised statewide “Weed List” compilation

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