



# National Park Service

## Invasive Species Contingency Planning: Phase 1



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A report prepared by Jordan Burroughs and Shawn Riley  
Department of Fisheries and Wildlife, Michigan State University  
for the National Parks Service Biological Resources Division

September 2006





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# Summary—Day 1

## **Welcome and Introductions**

Loyal Mehrhoff and Linda Drees welcomed the workshop participants and thanked them for assisting in this valuable decision-making process (see list of attendees at end of this report).

## **Overview of Need, Purpose, Approach, and Desired Product**

Existing tools for decision-making regarding invasive species management in national parks do not adequately address the complexity of the problem. A tool is needed that incorporates social as well as environmental concerns that may influence decision-making. This tool should assist in determining the need, urgency, and most appropriate type of response. Development of such a tool is a multi-step process including descriptive and quantitative phases.

The purpose of this workshop was to develop a decision support system that enhances our ability to identify information needed to make informed decisions about invasive species management (ISM). Particular attention was paid to assessment of collateral effects of management of invasive species.

The workshop had a four-pronged approach: use structured decision analysis protocol/tools to articulate key decision and considerations needed for ISM in national parks; develop principles and guidance for a triage approach to ISM; test and refine a preliminary decision aiding tool through concrete applications; foster development of collective articulation among participating experts of key decisions and consideration associated with ISM.

## **Overview of a Decision Support Systems and a Proposed ISM Decision Tool**

Shawn Riley provided an overview of risk assessments and structured decision analysis. Risk assessments determine how threatening a hazard is to another entity, typically the environment, human health, or financial resources. Risk assessment is often separated from considerations of risk management. This weakness of risk assessment may lead to mixing judgment about what is likely to happen with personal preferences of what should happen. Whereas a structured decision analysis evaluates complex alternatives to meet objectives in terms of values and uncertainty. The aim of structured decision analysis is to help decision makers with real-world choices.

## **An Invasive Species Risk Assessment Protocol (green book)**

The group discussed two key questions that need to be answered before a risk assessment could be completed, these include: (1) who is impacted by the decision, (2) what is the scale of the decision (decision space and geographic extent).

The group discussed the need for several screening questions on the assessment including:

1. What is the proper identity and prominence of the species (e.g., genetic origin, strain, variety)?
2. What is the species current distribution and abundance?
3. Is the species an invasive somewhere else?

The group provided suggestions (verbal and written) on specific ways to improve risk assessment. Discussion also took place on weighting or ranking questions, and answers within each question. The group suggested that weighting needs to be done at the appropriate scale and different panels of people may weight each question differently. The group asked whether the weighting process should be formalized or be dependent on species of interest.



It was suggested that a risk assessment must include:

1. Species specifics (document where, who, what, when)
2. Protocol for communication (process to contact experts and agencies)
3. Process for other agency involvement
4. Discuss knowledge base of species (i.e., contact the experts to discuss invasive potential [reproduction, movement, ecological amplitude, how much time do you have to act])
5. Visit site (determine specific questions for site visit)
  - a. Delineation of infestation (scale)
  - b. Pathways
  - c. Where did IS come from?

Need to archive all information and build a database with species information and provide a resource list of experts.

#### **Criteria for Response (yellow flow chart)**

The group discussed criteria for response to help determine how to respond to an IS. Would the Park prevent, contain, or eliminate the species? The group agreed that stakeholder engagement and public education needs to go on top of whatever option is chosen. Stakeholder engagement and education need to occur first and are the foundation of the entire process. A major challenge is the ability to articulate risk to managers (what is risk and the values associated with risk).

The group discussed some criteria to help determine type of response

1. Look at species invasiveness
2. Determine “values at risk” (who, where, how, when, what is being threatened)
3. What is feasible (how much time to respond)
4. Availability of resources
5. Politics of response (on area, region, nation)
6. Collateral impacts
7. Tactic(s) available for preferred response option

The preferred course of action may be elimination, but may have to settle for second best (containment). There needs to be a feedback loop to ensure type of response achieves objectives.

One group member suggested a 5-step process for ISM:

1. RA on species (what’s at stake?)
2. What response options are available?
3. What tools/tactics are available?
4. Can you use the tools (need stakeholder input)
5. Are you still capable of response option

Process/tool needs to be simple and need to be placed in context with everything else. Major challenge is how to get the attention of management to get the support and limited money to take action.



Interaction of four elements to help make a decision:

1. Understanding effects
2. Predicting values affected
3. What options are available
4. Predicting collateral effects

### **Collateral Effects Discussion (handout on white paper)**

Two questions need to be answered before an assessment of collateral effects can be completed:

1. What is the extent or magnitude (inside park unit or outside park unit)?
2. Who are the stakeholders?

The group also discussed a need to identify a team for each decision process. Partnerships are important, and terminology in the assessment must be consistent with the partners' terminology. There is also a need to determine the time needed to take action; what are the benefits versus consequences of immediate action? There is value in identifying 2 or 3 collateral impacts, but it needs to be done under specific circumstances.

Additional questions that need to be considered in collateral effects assessment:

1. Effect on existing operations or functions (cost)?
2. Training of employees and requirements of needs?
3. Effects on infrastructure (buildings)?

The group questioned the similarity between an IS risk assessment and NEPA. They also questioned whether there was a "hot button" that could override all other collateral impacts? Is there a "driving factor" that would drive the decision to manage?

There needs to be a process to make decisions; group suggested four process oriented questions:

1. What group of individuals or groups that need to be involved in the decision process
2. What group needs to be involved to implement the decision
3. What information is needed to make a decision or response
4. Who is the logical person(s) to make the decision

### **Day 1 AM Handouts**

IS Risk Assessment (green book) and score sheet (green)  
Beginning Tree (white)  
Response Options (box & whiskers - yellow)  
List of Management Action Alternatives (yellow)

### **Day 1 PM Handouts**

Collateral effects list (white)



## Summary—Day 2

### **Considerations in Assessment of Collateral Effects of ISM (blue book)**

There was a significant amount of discussion surrounding the need for a collateral effects assessment. The group questioned who would be using this decision tool and ultimately who will make the management decision (e.g., APHIS, FS, Public Health). The NPS is only a one partner in the decision-making process and often just manages the threshold. The group also expressed several needs associated with the decision tool including: the need to clearly articulate framework for the tool to work in, the need for a checklist or decision tree with “triggers” that would mandate to go to higher levels of authority to obtain guidance, and the need for a detailed description of the specific type of action alternative (e.g., aerial spray, hand spray, how much, etc.) and the affected environment.

Loyal provided his thoughts on how these risk assessments would be used in the decision making process. He suggested the IS risk assessment and the collateral effects risk assessment are the building blocks that lead to a structured decision making process. The end point of the process is a structured system to effectively evaluate the pros and cons (costs and benefits) of taking different management actions. There is a need to express both short- and long-term benefits and costs. Decision trees could be used to look at the probability of success of a particular management option to more effectively weigh the benefits and costs of taking that action.

The group also discussed how mitigation should be addressed. Whether mitigation should be addressed in the collateral effects risk assessment or separate from the risk assessment.

The group worked through a few questions in the risk assessment using salt cedar as their species example. The data sheets and summary table were modified during lunch to show short- and long-term benefits and costs.

### **Day 2 AM Handouts**

Assessment of Collateral Effects of ISM (blue booklet) and score sheet (blue)  
Collateral Effects Summary Table (yellow)

### **Day 2 PM Handouts**

Collateral Effects score sheet\_ver2 (blue)  
Collateral Effects Summary Table\_ver2 (yellow)



## Summary—Day 3

### Introduction of Refined Assessment of Collateral Effects

Shawn presented a refined assessment of collateral effects to the group. The refined assessment provided the option to indicate the magnitude and extent of the collateral effects: a plus sign for positive effects (+), negative sign for negative effects (-), zero for no effect, and “dk” for don’t know. The group was broken into 3 subgroups to work through specific case studies; subgroups were given questions to answer while working through the risk assessment. One subgroup was charged with developing a process for ISM.

### Breakout Group Reports

#### 1. Are the effects questions:

- a. **Comprehensive to considerations about collateral effects?**
- b. **Are there some collateral effects included that are unnecessary?**

Need to combine questions #7 & #10, questions #3 & #4, and questions #13 & #14 into 3 separate questions. Maintain question #5 and add site specific effects from landscape perspective. The effects on 1 acre may be different when thinking on landscape perspective. Scale affects the area of interest.

#### 2. **How much description is needed for the effect questions? What kind of descriptions are needed to help make the evaluations (please give example descriptions or modify existing descriptions for each question)?**

Not enough information is given, need more words and examples. Need range; really missed the scale from worst effect to best effect. Every comparison needs a reference point. Need better definitions and glossary. There is no reference point for comparison for questions #7, 10, 12 (very difficult to work through questions).

#### 3. **Are both short- and long-term assessments essential? Does seeking a distinction of short- and long-term assessments add value with respect to decisions to take action and what kind of action to take?**

Yes, may change to *project duration* versus *X years post project*. Yes, short- and long-term assessments are needed because managers tend to only think in the short term; this would force managers to consider long-term effects.

#### 4. **Among considerations of human and environmental effects (pertaining specifically to questions 1-12 in the blue book, or others not in the book), which influence decisions about management of invasive species the most for which there is the greatest uncertainty?**

Economic effects and management costs. How people would respond (human dimensions part); we don’t understand human reactions or attitudes. Ecosystem level effects.

#### 5. **How would you suggest dealing with the concept of “mitigation?”**

You have to understand mitigation throughout the assessment to get to the final mitigation question. Mitigation should be incorporated into the assessment and should be its own section. Mitigation should be taken out of assessment because it is part of the action.

### Day 3 Handouts

Collateral Effects of ISM\_ver2 (blue booklet) and score sheet\_ver3 (blue)  
Breakout Group Questions (white)



# Key Findings

An initial risk assessment relative to the risk of management interventions was initiated by this workshop, but needs further development through application.

Risk assessments relative to the risk of invasion exist, yet there was such differing opinion as to the adequacy of any particular assessment to not give firm guidance in the selection of any particular risk assessment. One of these assessment frameworks needs to be adopted, or a suite of risk assessments germane to particular units/regions need to be adopted and standardized for consistency. A lack of agreement on the risk of invasiveness makes it difficult to assess the risk and success of management interventions.

Specific needs include:

- A mechanism is needed to identify key uncertainties associated with invasive species management. These key uncertainties are defined as the points of management that require decisions and likely have the greatest effect on risk.
- A basis to assign and tabulate relative weights of importance to variables within the management risk assessment.
- Once key uncertainties are identified and relative weights of importance are developed, decision trees can be developed to portray the relative risk of decisions.
- An assessment is needed that is responsive and consistent with NEPA, but capable of more rapid application. Full NEPA processes will be too slow to react in management of invasive species.
- A consensus on best management practices relative to invasive species management needs development to add credibility to the management risk assessment.

Key impediments to development of a management risk assessment include:

- Lack of agreement on a particular risk assessment relative to invasiveness.
- A lack of an adequate communication network.
- A process is lacking for refining risk assessments as learning takes place with each new experience.





The workshop initialized a discussion and charted a pathway toward creation of a comprehensive risk assessment that includes considerations of both risks associated with invasive species and the management of those species. As a result of this workshop, a Web site was created to provide a general framework for understanding and predicting primary and collateral impacts (effects) of invasive species management. The Web site can be accessed through the Web address: <http://www.fw.msu.edu/orgs/nps/demo/INDEX.htm>.

### **The Web site is focused around 5 steps:**

STEP 1 - To effectively manage invasive species, managers must first be able to **identify the species** of interest and gather all pertinent background information on the species.

STEP 2 – To determine the potential invasiveness of the species, managers must **assess the threat level** of the species.

STEP 3 – To determine which human, natural, and cultural resources merit important consideration when managing for invasive species, managers must identify the **resource values at risk**.

STEP 4 - Invasive species management requires managers to determine the appropriate **management objective(s)** for each situation and the **feasible management strategies** to accomplish the objective(s).

STEP 5 – To consider the short-term and long-term secondary side effects of a management strategy, managers must **identify the collateral effects** associated with each feasible management strategy.

This Web site, and associated PDF documents, can be used as a decision support tool and may prove to be a valuable tool to work through the documentation of invasive species management decisions made by managers. Although the Web site is principally designed to guide managers through important considerations of invasive species management, it does allow managers to assess the threat level of a species, identify the resource values at risk, compare feasible management objectives and strategies, and consider the short-term and long-term collateral effects of the management decision. Knowledge gained by completing the interactive PDF forms on the Web site may help bolster managers' abilities to distinguish invaders with minor effects from those with large effects, which will encourage prioritization of management efforts and financial resources. The invasive species contingency planning process requires further refinement through implementation and testing of this decision support tool.

Opportunities for advancement of this invasive species management decision support process including: creation of additional interactive PDF documents using Adobe Designer; creation of a Web-based survey to record and analyze information (e.g., <http://www.surveyz.com/>); creation of decision software to analyze complex decision models (e.g., <http://www.treeage.com/>); employment of a consulting firm to develop a customized, interactive decision management tool (e.g., WFSM was developed by BalanceTech, LLC <http://www.balancetech.com/>).



# Meeting Participants & Facilitators

National Park Service  
Invasive Species Decision Tool/Contingency Planning  
September 20-22, 2005

## Meeting Participants

**Lars W.J. Anderson**  
Lead Scientist/Plant Physiologist  
USDA- Agricultural Research Service

**Terry Cacek**  
Invasive Animal Coordinator  
NPS - Biology Division

**Linda Drees**  
Chief, Invasive Species Branch  
Natural Resource Program Center

**CAPT Charles L. Higgins**  
U.S. Public Health Services  
Director, Office of Public Health  
National Park Service

**Dr.Lloyd Loope**  
Station Leader  
HFS: Haleakala Field Station

**Russ Mason, PhD**  
Science Advisor  
Association of Fish and Wildlife Agencies

**Dave Price**  
Chief of Resource Management  
Colorado National Monument

**Loyal A. Mehrhoff**  
Chief -Biological Resource Management Division  
U.S. National Park Service

**Brad Welch, PhD**  
Invasive Species Monitoring Coordinator  
National Park Service  
Inventory and Monitoring Program

**Margaret A. Wild, DVM, PhD**  
Wildlife Veterinarian  
Biological Resource Management Division  
National Park Service

## Meeting Facilitators

**Dan Decker**  
Professor  
Department of Natural Resources  
Cornell University

**Shawn J. Riley**  
Assistant Professor  
Michigan State University,  
Department of Fisheries and Wildlife

**Jordan Pusateri Burroughs**  
Wildlife Outreach Specialist  
Michigan State University  
Department of Fisheries and Wildlife

