

Invasive Species Breakout Group Notes

Definition of invasive Species

- Causes harm w/I system
- Native species- can also cause harm (Mtn Pine Beetle, Mtn Goat, etc)
- Invasive species can be native (disturbed system)
- Exotics may not be invasive (yet?)
- Problems:-overlapping definitions

Group name:- Suggestion change name to “Exotic and invasive species”

Change outside biological change

- w/i institutional aspects?

Assumption:

Ecological changes apply to ecosystems

Monitoring

Timeframe

Is Terminology limiting factor?

Future Issues: Interactions of other groups (CC, LUP)

Questions 110509 Morning

1. Engaging outside group(s) to address human dimensions issues (PC)

Research priorities (getting there)

- Based on risk assessments for ea invasive
- Guideline from decision makers view point (voice of decision makers)
- Landscape approaches (population = biological unit of concern)
- Risk assess(RA) = where to prioritize focus
- RA – identifies knowledge gaps
- Subcommittee fine scale assessment
- RA – taxa groups need to communicate w/ each other
- Detection and rapid response RA habitat vulnerability to invasion; what are the high priority areas of concern; (vector corridors linked to invaders)
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View Point

1. Risk Assessment

- a. Capturing events and thresholds of invaders
(Canada thistle, leafy spurge)
- b. Understanding components of change
- c. Management strategy assessment
- d. Given knowledge base – what is the best strategy
- e. Strategy is scale dependent
- f. May be limitations of monitoring and mapping – utility needs to be defined

2. Monitoring and Inventory

- a. GYA Aquatics – species info base lacking
 - i. Need sampling scheme (prioritization)
holistic framework for I&M
 - ii. Develop tool w/ broad applicability

3. Risk Assessment (rate of spread, impacts Limiting factors of spread)

- a. Scenario approach

4. New invaders (Where entering)

5. Management Response/outreach

- a. Definite outreach component
- b. Sp specific control
- c. Invasion pathways
- 6. Management Response (control efforts, Pub educ)
- 7. Research Questions (broader suite of questions)
- 8. Decision Support Systems
- 9. How to reach the public
 - a. How to market ideas to public
 - b. Need to address the users (spreading)
 - c. Limited options – efficacy of control strategies
 - d. How do we better engage the public in support of invasive sp problems?
 - e. What motivates and influences targeted audiences and drives their actions?
 - f. What outreach techniques are most effective at achieving desired outcomes?
 - g. How to develop evaluation methods for outreach programs?
 - h. What would be the best practices in outreach (where do you focus funds)
 - i. What are current and projected economic impacts of Invasive Sp in the GYA?
 - j. Economic tradeoff analyses vs. monetary

- i. Pure economic argument - (Lk Tahoe)
valuable for gaining funding

10. Feed back between above components

Managers thoughts on Monitoring

- Data is collected without clear application to problem
- What are you monitoring for (invasiveness, rate of growth,)
- Targeted surveillance – may not a control strategy for everything
- Control can cause more harm than good?
- RA = low risk then don't implement surveillance for early detection
- Scenario Planning – never enough info but need to make decisions (AM) must get started to know if successful
- Monitoring Mapping – time frame on control, field logistic problems prevent efficiency
- Monitoring and mapping needs to be targeted
- If you don't know where you are going any road will take you there

- Repetitive application problems
- Need to define better monitoring steps (assessment and identification of needed sites)
- Build on mistakes and successes – crews are rewarded for acres of control (invasive may come back next yr)
- Needs to be readily accessible database for field crews to document treatments and linked to lg accessible database to id spread info on lg scale
- Problem:- mixed participation in participation for lg-scale assessment (why have past attempts failed)
- In consistencies in analyses = formatting problems; need consensus on collection and formatting – alleviate implementation problems
- Need to overcome workload and funding issues
- Monitoring is crucial (GPS locations); ned to coordinate among agencies; needs to make life easier- remote sensing application/need (lg systems – on ground survey cannot be conducted)
- Need detection thresholds for lg scale system; once detected problem is large
- Prioritize I&M on probability of introduction
- Disease: once there game is over; what can you do

- Disease monitoring – state and health dept. can aid in early detection (WY CWD – state labs) infrastructure is already in place; can id what is on the horizon
- CWD – pathways of transmission; VHS (fish) – How do we monitor for what may be coming in

Recommendations for the GYA (Monitoring)

1. Red flag system – what is coming in (plants, animal and pathogens)
 - a. Example GYC – mapping – composite weed layer (on website)
 - b. Do this w/ animals and disease agents
 - c. Simplified standardized protocol for database
 - i. Repeat application and assessment of effect on invasive at same location
 - ii. Treatment monitoring – challenges to get all infestations annual
 - iii. Ocular estimates – some value at the least
 - iv. Density in log-ranked scale
 - d. Expand to multi-taxa system

e.

Research Questions: (20K)

Invasive Group Member Priorities (1/member - management)

1. Base line monitoring is management priority
 - a. What is on landscape now
 - b. Control mechanisms identified following
 - c. Frequent technical bulletins from research
2. Science does not = research
 - a. Do not need academic type research questions
 - b. Research needs for managers— apply good science to management questions
 - c. Managers know what is out there – they need an assessment of success (i.e. are they having an effect; when to apply treatments based on known biology/ecology of invasive)
 - d. Cheatgrass – no big effect yet? Should management be concerned about problems that are not pressing at the moment (ID time bombs);

- e. Inform management when to act and when to apply efforts elsewhere; Tell me what Managers don't know
- 3. Need inclusive Program
- 4. Need RA and Scenario Planning
 - a. Whats coming and how to address it?
 - b. Feral pigs: - possible problem?
- 5. Mapping specific and/or general for identifying invasives; tangible product to be used by field staff; effects of CC on what may be coming down the road
- 6. Scenario Planning and RA
 - a. Funding - optimal allocation of monetary resources
 - b. Build case for funding needs

Research Priorities

1. Scenario Planning and RA

- a. Need for adequate staff and funding for agencies/managers to take on
- b. Skill set is limited to those trained and experienced; managers need to be involved in data collection, but specialized staff conducting SP
- c. Managers need scenarios describing future challenges (i.e. science and research describing potential problems)
- d. Scenario Planning - Integrating information for prioritizing efforts

2. Integrated data monitoring

3. Economic analysis

- a. Efficacy
- b. Optimal Management

4. R&D Treatments

- a. What are factors that influence invasion

b. Ecological factors that facilitate invasion –
how to identify and treat those

5. Education and Outreach

Overarching Questions

1. What is the distribution, abundance and spread of invasive species in the GYA at multiple scales?
 - a. Need for an integrated and standardized baseline and monitoring data of invasive species and the larger system including human dimensions

2. What are the drivers (ecological processes and species traits) of spread of invasive species?
 - a. Need for baseline ecological knowledge
 - b. Need for baseline knowledge of human spread (vectors)

3. What are the biological and ecological impacts of invasive species in the GYA?
 - a. Need specific research determined by scenario planning
 - b. Need for basic research

4. How do we identify information gaps for scenario planning, control, and risk assessment?
 - a. What are the gaps in current knowledge of risk?
 - b. Where do we need new information

5. How do we engage the public on issues related to invasive species
 - a. Need for better understanding of human dimensions including values, expectations, behavior, and economic costs of invasive species

6. What are likely future scenarios (e.g. climate change land use change) of invasive species in the GYA at scales that are directly relevant to management issues?
 - a. Need for a GYA infrastructure to support regional and specific management scenario development needs

7. How do we share and communicate data information and scientific results to regional community of stakeholders?
 - a. Need better education and outreach tools including assessment
 - b. Need for basic research

8. How do we control and prevent invasive species?

- a. Proactive
- b. Reactive
- c. Integrated Management
- d. Influencing human behavior

Institutionalization (Including academic institutions)

1. Funding and training for a standardized field protocol
2. Assessment and inventory of human and computer resources and
3. What are alternative outside resources to contribute to repetitive but needed work (students, citizens)
 - a.

Key Invasive Species topics (Priorities)

1. Information synthesis
2. Moving beyond presence and absence
 - a. Moving toward scenarios and forecasting
 - b. Need cover and abund data; modeling capabilities
 - c. Need long-term monitoring data
3. What are long-term effects of treatments

4. Management scale = fine scale

a. Issues w/ on line modeling

Ecological changes (past, present, future) impacting GYA		Key science questions that address the expected management challenges resulting from these changes	Criteria needed to identify science priorities for the driver that is the focus of the breakout group (i.e., CC, IS, LUC)	Research priorities and approaches to address these science questions
1	Loss of biodiversity	<ol style="list-style-type: none"> 1. How does hybridization w/ non-natives effect native sp 2. Biodiversity declines on loss of natives 3. Effects of loss of biodiversity on the long-term persistence of native sp 4. Effects of loss of biodiversity on community stability 5. How does the methodology identify the impacts of the invasive on rare sp 6. What are the effects of biodiversity loss on economics 7. How do we gain the understanding of the public on the effects of biodiversity to engage them 8. Why is biodiversity important (link to 7) 	<ol style="list-style-type: none"> 1. Current distributions and abundances 2. Potential dist and abundance w/ climate change and LUC with associated uncertainties 3. Local and regional ecosystem effects 4. Potential for control 5. Cost of control plus opportunity costs 6. Sources of future reintroductions <i>and pathways</i> 7. <i>Potential and costs of restoration</i> 8. Social issues (education, outreach, funding availability, legal) 9. Determine spatial distribution and environmental habitat suitability for a species 	
2	Changes in disturbance patterns	<ol style="list-style-type: none"> 1. What are the aspects of Climate Change affecting the disturbance regimes? 2. What are the aspects of IS affecting the disturbance regimes? 3. What are the aspects of LUP affecting the 	<ol style="list-style-type: none"> 10. Allocation of resources to inventory/survey, monitoring, and control 11. Assistance in 	

		<p>disturbance regimes?</p> <p>4. Are certain systems more vulnerable to impacts of CC, IS, LUP?</p> <p>5.</p>	<p>predicting CC induced impacts on the unit and ecosystem</p> <p>12. Scenario Planning (predicting a range of possible futures and declaring uncertainties, accuracies, and scales)</p>	
3	Effects on human health	<p>1. What mngmt precautions from effects of disease?</p> <p>2. What are new vectors of concern to Human Health?</p> <p>3. What are the effects of human health from system disturbance?</p> <p>4.</p>	<p>13. Developing relationships with scientists and land managers using smart monitoring (iterative model improvement) and adaptive mngmt practices</p>	
4	Threats to Sp of concern	<p>1. Effects on species of concern (Grizzly, boreal toad, cheat grass, sage grouse,)</p> <p>2. What is the distribution overlap of In Sp and potential impacts to sp of concern?</p> <p>3. Identification of critical habitat</p> <p>4. Impacts of invasives on pop projections of T&E sp</p>	<p>14. Economic effects of the infestation</p> <p>15. Invasion rate (spread models and destination of vector)</p> <p>16. Monitoring dynamic system components (sensitive indicators)</p> <p>17. Develop probability models based on what is known (reliable predictor data, identifying uncertainties)</p>	
5	Simplification of ecosystems	<p>1. How does hybridization w/ non-natives effect native sp</p> <p>2. Biodiversity declines on loss of natives</p> <p>3. Effects of loss of biodiversity on the long-term persistence of native sp</p> <p>4. Effects of loss of biodiversity on community stability</p> <p>5. How does the methodology identify the impacts of the invasive on rare sp</p> <p>6. What are the effects</p>	<p>18. Need to prioritize the science to aid managers in addressing their problem</p> <p>19.</p>	

		<p>of biodiversity loss on economics</p> <ol style="list-style-type: none"> How do we gain the understanding of the public on the effects of biodiversity to engage them Why is biodiversity important (link to 7) What are the legacies of LUC and land management and the persistence of those legacies 		
6	Loss of keystone sp	<ol style="list-style-type: none"> How do invasives disrupt ecosystem processes (competitive ability)? Which keystone sp are at risk from invasive sp?? 		
7	Novel ecosystem effects	<ol style="list-style-type: none"> What are the emergent properties of an introduced sp?? What traits of species and system (spatial and temporal) those make invasiveness controllable? When do you prioritize system function via restoration to a desirable state (i.e. is restoration cost effective) 		
8	Disturbance Interactions	<ol style="list-style-type: none"> How do invasives affect fire freq, erosion and sedimentation? 		
9	<p>Mechanisms of introduction</p> <ol style="list-style-type: none"> Pathogen carriers (SSH) Complexity Globalization 	<ol style="list-style-type: none"> What are the critical control points for introductions? What are potential mitigative strategies to control spread of invasives? 		
10	Unintended MNGMT consequences	<ol style="list-style-type: none"> Will biocontrol agents escape What are the effects 		

		<p>on nontargets</p> <p>3. What are the effects on human health (i.e. spraying)</p>		
11	Economic impacts (World-wide)	<p>1. What are the costs of control and opportunity costs (i.e. costs of doing nothing)?</p> <p>2.</p>		
12	Ecosystem Services	<p>1. What are the effects of exotic sp on carbon sequestration?</p> <p>2. What are the effects on hydrology and water quality?</p>		
13	Management Mandates	<p>1. What are priority sp and areas to focus efforts?</p> <p>2. How do we conduct risk assessments for multiple problems?</p>		
14	Human Dimension (impediment) to change	<p>1. Public perceptions, level of acceptance, realistic expectations</p> <p>2. How do we motivate people to change behavior to prevent invasions (i.e. invasions in aquatic systems) and build consent to participate in preventing invasions?</p> <p>3. How do we include people that can communicate concern and participation to the concerned public?</p>		
15	Changing microbial communities	<p>1. How is soil biota changing?</p>		
16	Spillover disease transmission	<p>1. When are parks reservoirs for outside invasions?</p>		
17	Control Potential	<p>1. What species can be cost effectively contained?</p>		
18	Nonnative impacts on Physical and Chemical Processes	<p>1. How do non-natives affect biogeochemistry?</p>		
19	Identification of	<p>4. What are the thresholds of driving</p>		

	thresholds and forecasting	<p>variables of invasions?</p> <p>5. How do you apply thresholds to management decision making?</p> <p>6. How do we best reconstruct invasions to understand relative importance of processes?</p> <p>7. How do we use monitoring to best understand processes and instruct management?</p> <p>8. When do you prioritize system function via restoration to a desirable state (i.e. is restoration cost effective)</p>		
20	Invasibility –constraints and tolerance (physiological, environmental, and interactions w/ other drivers)			

Breakout session 1

Breakout session 2

Breakout session 3