Western Association of Fish and Wildlife Agencies

2015 Western Invasive Weed Summit
Summary and Next Steps

November 17-19, 2015

INTRODUCTION

Recent collaborative efforts by a diverse coalition of conservation partners to conserve the Greater sage-grouse (GRSG) across its range have elevated the public profile of the larger sagebrush landscape. Long-considered "flyover" country, the "sagebrush sea" is in fact one the largest ecosystem types in the United States and provides habitat for more than 350 native wildlife species. In addition, the sagebrush ecosystem supports regionally- and nationally-significant economic activities, including livestock grazing, energy production and outdoor recreation. Sagebrush also holds significant cultural and historic values for Native Americans and the nation as a whole.

With growing public awareness about this productive yet fragile place has come increased recognition that the health of the sagebrush ecosystem is in marked decline. While there are numerous causes of that decline, ranging from urban development to agricultural conversion, the most pervasive threat to the long-term viability of this landscape is non-native invasive annual plants and their role in fueling large, destructive wildfires, particularly in the Great Basin region. Compounding this threat is the synergy between invasive plants and other threats to the sagebrush ecosystem, including impacts from free-roaming equids, improper livestock grazing, and climate change. As the conservation community focuses on GRSG shifts to the larger sagebrush ecosystem as a whole, effective control of invasive annual plants has emerged as the singular need to promote a sustainable future for this uniquely American landscape.

The stakes are enormous: without effective control and management of invasive plants, and all the negative ecological effects that come with invasives, habitat loss and degradation will only accelerate in sagebrush ecosystem. As a result, we will see reductions in native wildlife populations, both big game species such as mule deer and non-game species such as sagebrush-dependent migratory birds. These wildlife population declines will ultimately lead to regulatory actions by state and federal wildlife agencies that will result in lost economic opportunities for communities across the region. If unchecked, invasive annual plants will continue to spread and will ultimately dominate the sagebrush ecosystem, fundamentally altering the natural composition and function of the ecosystem, resulting in a cycle of invasion and wildfire, adversely affecting wildlife and humans on many levels.

While local, state and federal government efforts to combat invasive annual plants are numerous and, in many instances, successful on a local scale, no comprehensive, cohesive strategy to combat and ultimately defeat invasive plants in the sagebrush ecosystem exists. In the absence of such a unified strategy land managers at all levels must confront these challenges in a piecemeal fashion. A piecemeal approach exacerbates the technical, policy, communication, and operational challenges and significantly inhibits our ability to effectively control

non-native invasive annual plants, break the current wildfire cycle, and conserve the sagebrush ecosystem. It follows that any strategy to address these challenges must be highly focused; closely coordinated; and, built on a robust platform of strong science, dedicated funding, and ongoing communication with policy makers at all levels of government. Moreover, the public must be informed about the problem and the need for and importance of, a durable campaign to arrest the spread of invasive annual plants in the sagebrush ecosystem and secure the ecological, economic and social values of this landscape for generations to come.

WESTERN INVASIVE WEED SUMMIT

To begin to meet this challenge, wildlife, wildfire and invasive species managers from across the sagebrush ecosystem came together in Boise, Idaho in November 2015 for the Western Invasive Weed Summit. Sponsored by the Western Association of Fish and Wildlife Agencies (WAFWA) the Andrus Center for Public Policy at Boise State University, and other partners, the purpose of the Summit was to convene agencies and organizations working to control invasive plants in the sagebrush ecosystem and "…develop an action plan to guide invasive plant management in the West."

Central to the Summit was the 2015 WAFWA report "Invasive Plant Management and Greater Sage-Grouse Conservation" (Ielmini et al., 2015); one of a series of seminal WAFWA publications commissioned by the U. S. Fish and Wildlife Service (USFWS) to assess threats the invasive plant-wildfire nexus poses to greater sage-grouse and its habitat. The report, published in advance of the Summit, provided an overview of the primary threats from invasive plants across the range of the sage-grouse; inventoried the constellation of agencies and organizations working to control invasive plants and the programmatic "infrastructure" within which that work occurs; and, importantly, highlighted a series of challenges and barriers currently precluding the development and delivery of an effective range-wide strategy for invasive plant control and associated recommendations for addressing those challenges and barriers.

Policy-level leadership for federal and state land and wildlife management agencies, together with leading scientists and managers in the invasive plant and fire fields, opened the Summit and issued a clarion call for action by all stakeholders to "take up Aldo Leopold's lance", declare war on invasive plants in the sagebrush ecosystem, and neutralize this pernicious threat to wildlife and people across 11 Western states where GRSG are found. Indeed, one senior official likened the scope and scale of the effort necessary to defeat invasive annual plants to the Manhattan Project, America's secret crash program during World War II to develop an atomic weapon before its enemies could do the same.

For three days, Summit participants, including senior leadership from state and federal wildlife and land management agencies, scientists, state and local weed control officials, fire and rangeland managers, ranchers, Native American tribes, nongovernmental organizations and others worked through a series of facilitated small-group breakout exercises aimed at further refining both the challenges and barriers and associated recommendations for resolution, as articulated in the WAFWA report, specifically:

- Information management and science
- Leadership, coordination and communication
- Policy and regulatory
- Program management and operational capacity

On the second day of the Summit, participants spent time considering these problems and solutions in a geographic context. Three breakout groups were formed focusing on the following: 1.) Great Basin – where the invasive plant-wildfire nexus is currently most prevalent; 2.) Rocky Mountain (eastern) portion of the range of the GRSG, where invasive plants are a growing concern, but are not yet at the same critical level as in the Great Basin; and 3.) WAFWA breakout group focused on additional refinements to the overall WAFWA invasive plant management report.

The rationale for this approach was to harness the collective expertise and wisdom of the conservation and fire and weed control professionals and focus that knowledge and experience on discrete topical and geographic areas. The results of these breakout session will become the raw material for an "Action Plan" that will offer land, fire and wildlife managers a comprehensive menu of strategies and tactics to address the invasive weed problem in the west. Furthermore it will support the development of west-wide policies to effective control and management of invasive plants, with common goals, shared resources, defined timelines, and strong scientific underpinnings. The ultimate goal is that all agencies and organizations working in the sagebrush sea will work collaboratively and conclusively to meet challenges posed by invasive annual plants to the future health and productivity of America's sagebrush ecosystem.

Day-1 Breakout Groups: Challenges and Barriers

Four Breakout Groups were established. Participation in these groups was voluntary as participants were asked to pick a group they would like to join. Hence the groups consisted of individuals with both interest and expertise in the subject. Breakout Groups were asked to use the "Think, Pair and Share process to evaluate the Challenges and Barriers listed in the WAFWA Invasive Plant Management and Greater Sage-grouse Conservation Report (WAFWA 2015). Specifically, participants were instructed to determine the following for each of the Barriers:

1.) Is the Barrier relevant;

2.) Is the Barrier stated properly, if not make the appropriate modifications;

3.) Are there additional Challenges and Barriers that need to be articulated, if so draft the appropriate language; and

4.) Rank (if possible) the Challenges and Barriers in order of importance (what needs to be addressed first etc.)

Using "Think, Pair, Share" process (Appendix III), each of the groups addressed the Barriers and summarized their responses by group. Each group then reported out on the Barrier. Outcomes were captured on flip charts, paper and computer Appendix I.

Group 1: Information, Management and Science

Facilitators: Sandy Gregory (BLM), Joan Suther (BLM)

Note takers: Dawn Davis (USFWS), Jake Losinski (BSU), Sean Finn (GNLCC)

The participants agreed that all four Barriers in the WAFWA Report (2015) were relevant, but that they all needed slight modifications. It was agreed that Barrier 1 and 3 were similar enough in context that they should be merged. Furthermore, participants agreed that one additional Barrier - specifically addressing limitations of researcher-practitioner communication and collaboration - needed to be added. Although the WAFWA Report (2015) did address the communication issue, the discussion was too understated (Page 14, Column 2, Paragraph 3) according to participants. Thus, Breakout participants agreed to the following:

Barrier 1: Lack of standardized surveys, inventory and monitoring and monitoring activities/capabilities and inadequate collection, retrieval and sharing of invasive plant data. (Combine Barrier 1 and Barrier 3 and rephrase).

Discussion: The real problem is lack of resources not lack of emphasis; entities at all scales are very much *emphasizing* surveys, inventories and monitoring but lack of coordination and resources for survey, inventory and monitoring activities as well as a lack of data storage and sharing opportunities is a key limiting factor. We

need to define the terms survey, inventory, monitoring. Guidance for invasive species field surveys and data interpretation must clearly address the need and purpose for inventories vs. surveys vs. monitoring. Therefore, follow up strategic discussion on this Barrier must address survey, inventory, monitoring individually, starting with clear definitions for each.

Participants called for both linked data collection standards (e.g., consistent collection of a set of core data fields that are linked to existing national standards) and site-level flexibility (e.g., so that local efforts can address site-specific needs). Field reports must include absence or 'negative' data so that stakeholders and partners are informed about what's been surveyed (reduce redundancy) and areas that are weed-free.

Participants recommended the need to 'front load' funding for monitoring (i.e., ensure funding for monitoring effectiveness is detailed in restoration or stabilization proposals) and develop protocols/programs to use the data that start with management relevant question(s) and require that a defined set of core data is always collected.

Barrier 2: Failure to understand, communicate (transfer), develop strategies and implement reestablishment of native or preferred vegetation perennial vegetation at a scale meaningful to sage-grouse. (Barrier 2 rephrase).

Discussion: Restoration of native plant communities require sustained effort because establishment and persistence of desired perennial plants in arid systems takes years or decades. Establishing deep-rooted shrubs requires persistence and commitment both to ensure treatments are adequately applied and that results at a site can help inform subsequent invasive weed management actions on-site and elsewhere.

We need to define 'treated.' As a community of practice, we need to standardize and classify actions to facilitate assessment in an adaptive management context. Participants also asked, "How do we define success and failure?" We need to define success in order to efficiently establish and evaluate objectives. Also, remove the stigma of 'failure' and redefine lack of establishment in a learning context.

Need to ensure we have abundant seed sources that are available when needed and (genetically) adapted to local environments and climates. Ecological site descriptions are key tool to help identify local environments and provide a template for matching seed source to local condition. We are missing a critical opportunity to design experiments into post-fire restoration including establishing control plots, blocking suites of treatments, and expanding replicates to landscape scales.

Barrier 3: Poor communication among managers and researchers to ensure initial questions and research decision processes continue to match manager's needs and produce usable information and tools. (Barrier 3 added).

Discussion: Nearly every group reporting identified an important disconnect between scientists and managers. The communication Barrier was identified as "2-way" and examples cited both the need for practitioners to more accurately communicate high priority questions that can be addresses through science and monitoring and for researchers to effectively communicate they kinds of information research can deliver as well as actionable interpretations of research findings.

In its most basic form we need opportunities for managers need to communicate what is needed to scientists. Participants recommended this be a focus early on in the process; managers need early input into the questions asked; so that research development is tightly tied to decision processes.

There is a critical need to translate science (e.g., technology, seed, etc.) to managers for efficient application. Participants identified this as a specific deterrent to implementation of science to decision-making and adaptive management. Researchers also must learn to communicate more clearly about uncertainty for managers.

Barrier 4: Lack of certainty for actions under a changing climate (Barrier 4 unchanged from WAFWA (2015).

Discussion: Participants suggested that uncertainties about future climate could be considered as more of a challenge than a barrier. Some voiced that climate is not a primary barrier yet but that climate models need to be considered in ongoing resistance and resilience approaches to sagebrush conservation and weed management. In other words, some participants suggested that other factors (see Appendix 1) have higher temporal priority than climate change. Nevertheless, the group agrees that a lack of certainty when informing appropriate actions under a changing climate was an important barrier to effective weed management. Furthermore, social and economic response to climate change, as well as environmental response, must be considered when planning and implementing restoration activities

Group 2: Leadership, Coordination, and Communication

Facilitators: Chris Rose (BLM),

Note takers: Rick Kearney (GBLCC)

The participants agreed with all four of the original Barriers. However, each Barrier was restated to better reflect the need.

Barrier 1: Lack of leadership, commitment and accountability has led to inconsistent institutional support and emphasis on invasive species management at nearly all levels of government (local, state, tribal and federal).

Discussion: A major obstacle to dealing with the challenge of invasive plants is a lack of leadership at the national level to work with state, local and tribal authorities to develop a cohesive strategy based on a shared vision. The National Invasive Species Council (NISC), a group established in 1999 under Executive Order 13112, has not succeeded in carrying out its responsibilities to develop and maintain an updated Invasive Species Management Plan nor to oversee the activities of federal agencies in carrying out invasive species management actions. The absence of a unified national strategy involving public and private organizations has prevented many groups from seeing how their individual actions relate to other groups and/or contribute to a larger effort.

In addition to the above reality, a chronic lack of organizational and financial support continues to impair the scope and effectiveness of most government invasive species management (ISM) programs. Controlling the spread of invasive weeds is not seen as central to any agency's mission and, therefore, inadequate manpower and financial resources have been provided to this activity. For the control of invasive species to be most effective, federal agencies must establish ISM as a priority goal, dedicate the necessary resources to its achievement and hold leaders at all levels accountable for achieving ISM objectives.

Barrier 2: Coordination and collaboration with stakeholders and affected communities have been inadequate.

Discussion: Executive Order 13112 tasked the NISC to develop the Invasive Species Management Plan through a public process and in consultation with Federal agencies and stakeholders. The coordination and consultation to date has not reached the level needed to produce a cohesive ISM strategy. While there has been effective coordination at the local level in many places, this has not extended to the regional or national levels. Much greater emphasis must be placed on communication and coordination across organizational, geographic and social boundaries to achieve better efficiency.

Barrier 3: Lack of effective and strategic communications and engagement with target audiences (includes a need to identify target audiences, key messages, desired outcomes and common language in communications)

Discussion: An effective national ISM strategy will require the support of key federal and state legislators, private organizations, and the general public. To achieve this support, an overarching communications strategy is needed that includes target audiences, key messages, common names and definitions, etc. The goal of such a strategy would be to raise awareness and support for ISM activities among target audiences and the public. The strategy must include clearly defined goals, outcomes and measures of effectiveness.

Barrier 4: Lack of integration of social sciences into invasive species management to address landscape health problems.

Discussion: The sheer size and complexity of dealing with the invasive species situation will require changes in both public attitudes and individual behaviors. Integrating social sciences into ISM programs will be necessary to address the perceptions, motivations and social obstacles that have impaired the implementation of ISM.

Group 3: Policy and Regulatory

Facilitator: Matt Kales (USFWS), Warren Ririe, (USFS)

Note Takers: Terry Rich (BSU), Todd Hopkins, (GBLCC)

The Group agreed that the original two Barriers were accurate. However they felt that there needed to be re-stated to more accurately reflect the Challenge. In addition they offer some additional Barriers that need to be considered. Barrier 1 and 2 (below) are the restated Barriers and new Barriers are listed as #3-7 below.

Barrier 1: Lack of effective legal and regulatory framework for invasive species management.

Discussion: Generally the Barrier is worded appropriately. The legal framework exists, however "*effective implementation"* is difficult – there are different NEPA approaches in each federal agencies. Moreover, there is poor differentiation regarding levels of infestations and priorities for management. All agencies interpret NEPA differently – there is a lack of leadership and piggybacking across multiple NEPAs is a concern. Also, directives "no net increase" for 5 years, followed by a 5% reduction per year thereafter needs some teeth. Phased implementation or stepwise implementation is probably the most useful approach.

Barrier 2: Insufficient incentives, evaluation, monitoring, compliance, and inconsistent enforcement (re-worded).

Discussion: The focus should be on incentives. Additionally, to be effective we need a National Policy that both federal and state agencies abide by (e.g., state-fed policy on invasives management). Weed-free hay, soil, rocks for roads is an issue. How to get the states to consistently implement a unified approach?

Barriers 3: Lack of a National Invasive Species Policy with measurable outcomes led by a single responsible entity (new barrier).

Discussion: We need to guard against "too many "invasive species cooks in the kitchen". We need a unified leadership approach.

Barrier 4: Lack of clear roles, responsibilities and coordination of organizations at multiple levels (new barrier)

Discussion: "Sage-grouse is the poster child for the failure of a national invasive policy".

Barrier 5: Lack of a consistent and effective approach for appropriating funding tied to a comprehensive invasive species and restoration goal (new barrier).

Discussion: A streamlined processes for moving funds among and between agencies, states, and cooperating partners, to accomplish invasive species goals is needed. The challenge is to quickly and efficiently move money where it can be most effective – to a public or private entity.

Barrier 6: Insufficient effectiveness monitoring tied to adaptive management (new barrier).

Discussion: Monitoring for some endpoint or threshold – not just for monitoring sake is a significant need.

Barrier 7: Lack of consistent and transferable data on invasive species (new barrier).

Discussion: New science is not being implemented into the regulatory framework.

Group 4: Operational Capacity and Program Management

Facilitator: Alan Clark (UTDNR)

Note Takers: Lindy Garner (USFWS)

This Breakout Session was composed of almost all federal agency personnel. There was representatives from state agencies, county, University Extension agent, and Non-Governmental Organizations (NGO's). The group agreed that they found the six original barriers still relevant. However, they added four additional Barriers and felt that the narratives were lacking a full description of the issue, or were not as complete as they should be to accurately describe the issue.

Barrier 1: Highly variable management prioritization of high risk invasive plants

Discussion: Programs do not emphasize sagebrush restoration when targeting invasive plants across the range of the GRSG. There was an emphatic agreement with the first half of the barrier statement regarding variable prioritization, but felt the second half of statement was more relevant in that no one was following up treatment with restoration. Yet, knowing that, they felt the most important barrier was the lack of prioritization, or all-hands-on-deck attitude.

Most of the group felt the second half of the barrier statement should be taken off and concentrate on this issue of prioritization.

Priorities and responsibilities are not well defined. Some deal with any or all-invasive plants while some only address them if they are listed as a noxious weed. Significant concern by states and others that invasive plants should be addressed, not just cheatgrass or just annual grasses; the group felt it should be a broader approach of invasive plants threatening integrity of sagebrush grasslands, and need to have priorities and responsibilities much better defined.

Most of group agreed to cross out second half of the original barrier statement (e.g., "Programs do not emphasize sagebrush restoration when targeting invasive plants across the range of the GRSG"). However, if this statement was to be deleted, the narrative needed to better capture and discuss the issue of differing management emphasis across jurisdictions. The group felt strongly that the issue of varied mandates was significant for treatment priorities, much less whether there is a comprehensive restoration program. This results in a lack of emphasis on sagebrush grasslands (public--vs.—Ag—vs.—shrub steppe—vs.—recreation) ultimately leads to varied mandates.

There is a big difference with how much emphasis is placed on treatment projects between invasive plants and noxious weeds. Within a state, the noxious weed lists are coordinated, but between states there are different lists and priorities. The group felt the barrier is a lack of specific risk assessment and prioritization being supported at local levels. Since many invasive annual grasses are generally not listed as noxious weeds, they don't get

prioritized for use of resources, or can't utilize state resources because of state weed laws requiring them to only use resources on listed noxious weeds. If states and counties are going to be required to implement as cohesive federal-state linked program for non-listed invasive plants, additional, new funding must be identified. It also needs to be recognized that local input on noxious the weed list, as well as setting of priorities is critical, regardless if the species is on the noxious weed list.

The challenge is how do we make species that are not on the noxious weed list a priority, how can states and counties legally spend resources on these species, and what other mechanisms can we develop to coordinate with everyone for these species to be a priority.

Barrier 2: Lack of internal structure and capacity for weed management programs at all levels

Discussion: There is not "a lack of" internal structure. Rather the group felt it was "inadequate and inconsistent" internal structure, and capacity. It is also important to consider culture and accountability for weed management, at all levels (e.g., Lack of internal structure, capacity, culture, and accountability for weed mgmt. at all levels).

Inconsistent structure often results from a lack of guidance or a cookbook for what a good invasive species program should look like. We lack a clear definition of the foundational elements. There is little value put on native rangeland ecosystems, thus we need to put a higher institutionally value on those ecosystems to gain organizational recognition for capacity. There is a lack of emphasis at all levels for invasive species management. Rather the emphasis is on fuel and fire prevention that are often moving targets resulting in little or no funding for weed management. There needs to accountability at all levels.

Barrier 3: Inconsistent and inadequate federal funding at the field level, which transfers the burden to state and local governments to get treatment work accomplished on the ground.

Discussion: There is a lack of consistent and focused federal funding at a base level. Federal agencies are always shifting funds between programs, which gives the impression that the invasive work is discretionary. What is needed is streamlined, line item based, consistent funding at local level to support a comprehensive, base program. It is critical to show that invasive species management are important and deserve the same urgency as wildfire. There is a great concern that if we don't re-align programs adequately staff the programs and develop well-defined priorities (based on invasion ecology and restoration) our efforts will continue to fail.

Barrier 4: Inconsistent, fragmented and undervalued prevention operations.

Discussion: The term "under-valued" really highlights the issue and conveys an important reality that must be recognized.

Barrier 5: Lack of an effective Early Detection and Rapid Response (EDRR) system across the landscape.

Discussion: The primary issue is the lack of emergency funding, a streamlined NEPA process, and the lack of systematic surveys (monitoring) to "know" when and where an invasive plant should be considered as an EDRR species. What about changing "effective" to "consistent"; often we can be effective, but only as long as money is there, but if money goes away or is inconsistent then cannot be effective long term

Barrier 6: Inadequate restoration strategies, implementation, and approaches.

Discussion: This barrier and its wording was not adequately specific to please most of the group. They felt restoration meant a lot of different things to different people. Hence, they recommended that it be reworded (e.g., "inadequate strategies, NEPA implementation, and approaches for restoring resistance and resilience.

Barrier 7: Inadequate restoration expertise and capacity exist in weed programs.

Barrier 8: Lack of consistent collaboration between federal and non-fed partners.

Barrier 9: Lack of prioritization for invasive species management on the part of agency leadership.

Barrier 10: Lack of a national priority being placed on shrublands and grasslands (Create a Healthy Grassland Restoration Act)

Day-2 Breakout Groups: Great Basin; Eastern Portion of the Range of GRSG; Original WAFWA Report

Three Breakout Groups were established. The topical breakout groups were: A.) Great Basin; B.) Eastern Portion of the Range of GRSG; and C.) WAFWA, 2015 Invasive Report. Similar to Day-1, participation in these groups was voluntary, as participants were asked to pick a group they would like to join. Hence, the groups consisted of individuals with both interest and expertise in the geographical subject area. Breakout Groups A. and B. were asked to focus/consider the existing environmental and political conditions within those geographical delineations. Breakout Group C was asked to focus on the larger "big picture" environmental, policy and funding issues identified in the WAFWA Report. Each Group was then asked to consider the modified list of challenges and barriers developed on Day-1 and develop short and long-term actions that were necessary to address and/or ameliorate those challenges and barriers.

The Breakout Groups spent the entire day developing these actions. To facilitate developing these actions, each Breakout Group divided their participants into small 4-7 member table-groups. These small groups developed detailed actions. Once the small groups had developed their list, the entire group gathered, evaluated the various actions and collectively selected in priority the top-3 long-term and short-term actions that needed to be employed in the geographical/topical area to address the challenges and barriers. The results of this priority setting can be found below. A complete list (including the small table groups) of the recommended actions by Breakout Group can be found in Appendix II.

Recommended Short-term and Long-term Actions

GREAT BASIN

Facilitator: Sandy Gregory (BLM) Joan Suther (BLM)

Note Takers: Dawn Davis (USFWS), Jake Losinski (BSU), Sane Finn (GNLCC), Priya Nanjappa (AFWA)

Short-Term (3 and 4 tied)

1. Develop a strategy for secure funding of weed management at multiple scales:
    a. Federal, state and local level.
    b. Contributions by stakeholders for fees in use arrangements.
2. Develop a national policy with a strategic plan for invasives that includes:
    a. Socioeconomic values
    b. Geographic barriers
    c. MOU to develop organizational structure and roles
    d. Inventory of existing policies
    e. Identify and designate and prioritize national intact landscapes (NIL)
    f. Best management policy
3. Streamline process to pool/utilize funds across fed, state, private, local, NGO, etc. towards invasive species management goals (like "service first").
4. Develop new and implement metrics for assessing bunchgrass readiness to tolerate grazing.

Long-Term

1. Development of new or innovative restoration techniques / species and associated technology transfer:
    a. Early serial species (native/annual/forb)
    b. E.g., Seed pillows, coatings
2. Establish a mechanism for periodic data sharing, tech. transfers, successes and failures for adaptive management, funding, policy and communication.
3. Develop statewide/regional strategic plans involving all stakeholders to address weeds.

EASTERN RANGE

Facilitator: Chris Rose (BLM)

Note Takers: Lindy Garner (USFWS)

Short-term

1. Concentrate treatments in areas that have a high probability of success-13 (Operational lack of funding).
2. Standardize data collection and reporting across all jurisdictions for survey inventory and monitoring- 13 (Information Management and Science).
3. Develop overarching vision and national strategy to include all levels of stakeholders (NISC, and ISAC) (Leadership, Coordination, and Communication).

Long-term

1. Line item in budgets for invasive species management will be in place- 18 (Operational Lack of Funding).
2. Implement agreed upon standards for database reports/ outputs accessible to all partners for data sharing/ exchange/ analysis-12 (Information and Science).
3. Workforce planning to establish full-time positions dedicated to invasive species management (especially at the field level)-8 (Operational Lack of internal Capacity).

WAFWA REPORT

Facilitator: Matt Kales (USFWS), Alan Clark (UTDNR)

Note Takers: Rick Kearney (BLM), Carolyn Swed (USFWS)

Short-Term (3 and 4 tied)

1. Convene a group (list specific entities) to identify ways to streamline the NEPA process for invasives projects, including the potential development of Categorical Exclusion authority, programmatic analyses, templates, training, strike forces, etc. This action was re-drafted from a set of 4 similar actions proposed by different groups "WAFWA, WGA, NASDA, and other partners" were suggested entities.
2. Convene a meeting with county, state, and federal agencies and other appropriate groups working with sage-grouse priority areas to identify existing databases and define and establish a data

exchange mechanism and objectives. This effort should be pared with a corollary initiative to develop scientific standards, protocols and methods for invasive species assessment and monitoring to be used for (a) determining the most critical locations for prevention emphasis, and (b) accurately tracking spatial dynamics of weed populations over time as well as the impact of weed treatments on those dynamics.

3. Form and fund a program for restoration of at-risk core sage-grouse habitat with a multi-discipline approach at a scale relevant to sage-grouse (e.g., EQW, BAER, or a scaled-up version of the Utah's Watershed Restoration Initiative).
4. Create a cooperative initiative for protection/restoration of sagebrush ecosystem, led by states and feds and informed by stakeholders, and identify a funding mechanism to incentivize the cooperative.

Long-Term

1. Establish dedicated funding for invasive weeds with measurable outcomes that include treatments, survey, and monitoring.
2. Establish a national EDRR funding mechanism (source) with consistent long-term high (adequate) level of funding.
3. Identify gaps for locally adapted seeds and fund contracts for productions.

Next Steps

The goal of the Summit was to capture the collective wisdom (public and private) of the professionals working in invasive plant management to clearly identify the challenges and barriers to effective prevention, control and management of invasive plants in the sagebrush biome. Moreover, once agreement was reached on what the challenges were, the Summit participants developed a list of actions necessary to address the challenges and barriers. The short term and long term actions reported in this summary report above serve as guideposts for developing an Action Plan that agencies and private concerns can use to address the invasive plant species threat in the west.

Invasive species management is an example of one of those pervasive management problems in the West that everyone has concern and responsibility for, but no one organization has ultimate responsibility or authority over. Therefore, to effectively address the problem we must develop a collaborative process that draws on all the entities to develop a dynamic Action Plan (guided by the results of this Summit) that individual agencies can agree, and where those agencies volunteer to implement appropriate parts of the plan. Once this plan is developed and adopted by the agencies, a multi-organization implementation team needs to be established to track implementation progress, identify problems and generate consensus solutions, and share resources where practical to accomplish appropriate and effect weed management.

Since the Summit, a multiagency Western Invasive Weed Action Plan Team has been created. This group will meet in early March 2016 to begin work on an initial draft of a Western Invasive Weed Action Plan. The draft Action Plan will be distributed to the invasive weed management community at large to receive input, prior to finalization. And finally, discussions have begun between the federal agencies, WAFWA and the Western Weed Coordinating Committee (WWCC) regarding the establishment of a standing Action Plan Implementation Committee.

To be successful in managing Greater sage-grouse, rangeland fire and the sagebrush biome as a whole will take a paradigm change never seen before. The days of each agency going their own way to address landscape scale management problems are over, as it has become clear that this approach is what has got us to where we are

today. To be successful in addressing landscape scale threats like invasive plant species, it will take everyone (public and private) working together in an epic collaboration. The paradigm shift in weed management starts with the ideas generated from this Summit and developing an effective collaborative approach to invasive weed management in the West.

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Direct all questions to: Ken Mayer, WAFWA Fire and Invasive Initiative Coordinator (ken.e.mayer@gmail.com)

APPENDIX I: Challenges and Barriers Breakout Sessions - raw notes

> Note: Barriers that have been re-written are shown *in italics* with the changes included, as are new barriers.

Group 1: Information Management and Science Challenges and Barriers

Facilitators: Sandy Gregory, BLM; Joan Suther, BLM

Notetakers: Dawn Davis, FWS; Jake Losinski, BSU; Sean Finn, GNLCC

The Breakout Session on Information Management and Science Challenges and Barriers, held on the afternoon of Nov. 17 was attended by approximately 55 persons who self-selected into nine discussion tables. Attendees were instructed to use the Think, Pair, Share process (See Appendix 3) to evaluate the Challenges and Barriers to Information Management and Science, listed on pages 13-14 in Invasive Plant Management and Greater Sage-grouse Conservation (WAFWA 2015). Specifically, participants were instructed to determine the following for each of the four identified Barriers:

#1 Is the Barrier relevant?

#2 Is the Barrier stated properly? If not make the appropriate modifications;

#3 Are there additional Challenges and Barriers that need to be articulated? If so draft the appropriate language;

#4 Rank (if possible) the Challenges and Barriers in order of importance (what needs to be addressed first etc.)

Using Think, Pair, Share, each of the 9 groups addressed Barrier 1 and summarized their responses by group. Each group then reported out on Barrier 1. Outcomes were captured on flip charts, paper and computer. Due to time constraints and recognition that 9 groups generated much redundancy addressing Barrier 1, we modified the process and assigned Barriers 2-4 to only 3-4 of the groups. Following the Think, Pair, Share process each group reported on the Barrier(s) they addressed.

Summary of Tasks 1 & 2 (Appropriate modifications of Barriers to Information Management and Science)

Following report out and discussion, participants agreed that all four Barriers in the WAFWA Report (2015) were relevant but that they all needed slight modifications. It was agreed that Barrier 1 and 3 were similar enough in context that they should be merged. Furthermore, participants agreed that one additional Barrier - specifically addressing limitations of researcher-practitioner communication and collaboration - needed to be added. Although the WAFWA Report (2015) did address the communication issue, the discussion was too understated (Page 14, Column 2, and Paragraph 3) according to participants. Thus, Breakout participants agreed to the following:

Barrier 1: *Lack of standardized surveys, inventory and monitoring and monitoring activities/capabilities and inadequate collection, retrieval and sharing of invasive plant data.* (Combine Barrier 1 and Barrier 3 and rephrase)

Barrier 2: *Failure to understand, communicate (transfer), develop strategies and implement reestablishment of native or preferred vegetation perennial vegetation at a scale meaningful to sage-grouse.* (Barrier 2 rephrase)

Barrier 3: *Poor communication among managers and researchers to ensure initial questions and research decision processes continue to match manager's needs and produce usable information and tools.* (Barrier 3 added)

Barrier 4: Lack of certainty for actions under a changing climate (Barrier 4 unchanged from WAFWA (2015).

Synthesis of additional challenges and barriers articulated by Breakout Group participants

Both the Think, Pair, Share process and following reporting and discussion generated supporting and divergent concepts specific to these four Barriers. The following summarizes those concepts.

Reporting in support of Barrier 1: Lack of standardized surveys, inventory and monitoring and monitoring activities/capabilities and inadequate collection, retrieval and sharing of invasive plant data.

Participants agreed that the term 'lack of emphasis' (WAFWA 2015) was not appropriate because the real problem is lack of resources. It was mentioned several times that entities at all scales are very much emphasizing surveys, inventories and monitoring but that lack of coordination and resources for survey, monitoring and inventory activities as well as a lack of data storage and sharing opportunities was the key limiting factor. Not surprisingly, priority recommended actions put forth from the Summit (see below) emphasize a need to secure additional funding and support and to get more strategic in our collective approach to invasive weed management.

A second unanimous concern was the need to define the terms survey, inventory, monitoring, understand that they are not all the same thing and to clarify the goals, strategies and techniques needed for each. Breakout participants agreed that the document confuses presence/absence surveys with other forms of monitoring. Guidance for invasive species field surveys and data interpretation must clearly address the need and purpose for inventories vs. surveys vs. monitoring. For example, approaches to early detection surveys and treatment effectiveness monitoring are much different and the challenges and barriers to these likely differ substantially. Broad lumping of divergent elements like this hinders our ability to address each effectively. Therefore, follow up strategic discussion on this Barrier must address survey, inventory, monitoring individually, starting with clear definitions for each.

Much discussion was focused on a need for standardized data collection techniques. Participants agreed this was a very challenging and complex topic and dependent on concise definitions (previous paragraph). The group recognized this data standards issue calls for both linked data collection standards (e.g., consistent collection of a set of core data fields that are linked to existing national standards (like the National Resource Inventory) so that analysis of field conditions are comparable across geographies and can be rolled up into meaningful and accurate regional summaries) and as well as site-level flexibility (e.g., so that local efforts can address site-specific needs). It was widely agreed that all invasive weed survey and monitoring programs should be required to report bounding coordinates for survey data (i.e., accurately define area surveyed) and report absence or 'negative' data so that stakeholders and partners are informed about what's been surveyed (reduce redundancy) and areas that are weed-free. Likewise, participants cited a critical lack of pre-disturbance data and called for consistent base surveys to help frame the extent and speed of annual grass invasion. Some participants also voiced a need to simplify field data collection to enhance effectiveness at scale. This concern could be interpreted as contrary to the former suggestions for field data collection (i.e., we need abundant and complex data from surveys), but participants felt confident that an appropriate team of experts in sampling

design, statistics, and field implementation would be able to develop scaled protocols that are appropriate for local and regional data syntheses. Indeed, one priority action for this Summit is to convene such a body of experts to define scientific standards, protocols and methods (see below).

Participants called for a common database for reporting results of inventory and monitoring. Indeed, a high priority, short-term goal proposed by the WAFWA Report group was to convene experts to identify standards for database design and craft field definitions. Such data standards would help avoid duplicative effort and enhance regional awareness of what others are doing. Some participants suggested that a single 'master' database not needed, that it could be unwieldy in size and complexity especially given the large numbers of projects expected to contribute to it. Instead, they offered, a federated or distributed network of databases would be sufficient and practical. It was additionally suggested that each partner organization/agency should identify a point person as quality control coordinator. The appointee would be charged with focusing on data consistency for all the organizations invasive plant survey data. Such a position would necessitate direct funding specifically for data managers/management to improve quality assurance/quality control; also direct funding specifically at data managers/management; data management element needs dedicated funding

6. Invasive species is never the first priority; invasives management always considered as secondary to fire, commodities, and recreation, therefore funds for weed control redirected to those higher priorities

7. Identify point person from each organization/agency as quality control coordinator; focus on consistency to improve quality assurance/quality control; also direct funding specifically at data managers/management; data management element needs dedicated funding

8. Better use of remote sensing for coarse resolution surveys and monitoring.

9. Success has not been defined … the question has not been defined. Need some unifying goal at the broadest scale to facilitate standard actions and data collection/storage. Must scale to local issues/question but also needs to scale up.

10. Concern that Washington DC priorities do not consider, reflect or match local priorities. Priorities must be set at local level and scale up to regional and national, not the other way around.

11. Scale issues also at local level: perceptions of threat and action differ among managers and jurisdictions (i.e., tribes vs. federal managers vs. county weed control)

12. Private lands and privacy laws & issues must be directly addressed. How do we ensure valid privacy concerns and assemble landscape coordination and data collection at same time?

13. Need a strategic approach to monitoring; often there is none but even when monitoring data is collected it sits in a drawer and not used for assessment or adaptive management; front load funding for monitoring and develop protocols/programs to use the data that start with management relevant question(s) and require that a defined set of core data is always collected (tie to National resource Inventory or other established standard)

14. 'Cultural' issues regarding use of data. Much data is not used to inform decisions. Why collect data that won't be used? Why are we not using data we have?

15. Need more apparent opportunities to collaborate; many local actors aren't aware of where/how to network.

16. Need to cross-reference state (and other) noxious weed lists; jurisdictions need to be cognizant of their neighbor's concerns and activities so parties are not working at cross purposes.

17. Need better communication and messaging to the public to raise awareness and garner support for weed management.

18. Need more funding.

Reporting in support of Barrier #2 (Failure to understand, communicate (transfer), develop strategies and implement reestablishment of native or preferred vegetation perennial vegetation at a scale meaningful to sage-grouse.)

1. Restoration of native plant communities require sustained effort; Need better commitment to establish deep rooted shrubs

2. Need standard definitions and actions for 'treatment'; what does 'treated' mean? Standardize & classify actions

3. Need to evaluate objectives - are they appropriate? Influence how we define success and failure.

4. Need to ensure we have abundant seed sources that are available when needed and (genetically) adapted to local environments and climates; ecological site descriptions are key tool to help identify local environments

5. We lack knowledge transfer about native seed ecology – the knowledge is there, it's just not communicated well enough

6. Need for pre-disturbance vegetation community condition data/information so we can set reasonable targets for restoration post disturbance.

7. Better communication between managers and scientists so managers have input into research design and researchers are able to take advantage of restoration activities.

8. Missing a critical opportunity to design experiments into post-fire restoration (ESR) including establishing control plots

9. Defining success and reasons for failure. For example, statistic referencing 90% failure is not in context; set up a framework for reporting successes and failures so we can document success and communicate; remove stigma of 'failure' and redefine in a learning context

10. Need to directly address the importance of soil biotic crusts as element influencing success/failure

11. Time horizons for monitoring need to be lengthened (10-15 years minimum) as a more accurate measure of success and failure.

12. This barrier needs to be fully within the context of adaptive management.

13. Need research and technology transfer on new and emerging techniques (i.e., seed banks, seed coating, timing, etc.)

14. Sagebrush community succession needs to be considered in seed mixes, not just climax species. Consider a portfolio approach to investments that tests seed mix and adaptive management.

15. Climate considerations important here (cross-reference with Barrier 4), especially if we're trying to establish perennial vegetation at sites no longer suitable or soon to be unsuitable for a given species.

16. Terminology is important: "desired non-natives" is inappropriate; we may tolerate them but they are not the long-term goal; consider terms like 'acceptable'.

17. Need to more specifically address of livestock grazing (including feral horses) impacts post-treatment.

Reporting in support of new Barrier #3 (Poor communication among managers and researchers to ensure initial questions and research decision processes continue to match manager's needs and produce usable information and tools.)

1. Need better communication among managers and researchers to ensure initial questions and research decision processes continue to match manager's needs

2. Disconnect between scientists and managers – need better coordination / communication; Better communication among scientists and managers – applied science and opportunities for management driven experimental design

3. Translate science to managers for use (technology/seed/etc.); managers need to communicate what is needed to scientists

4. This barrier needs to be clearly identified as a specific deterrent to implementation of science to decision-making and adaptive management.

5. Focus on early collaboration early in the process; managers need early input into the questions asked; gets to the use of the data

6. Barrier between researchers and managers implementing treatment; lack of reporting of seeding negative results by management (better communication)

7. Fix issues of communication collaboration among researchers and managers; collaboration amongst those who need to share the data

8. Clearer communication about uncertainty for managers; focus on knowns (like increased temperature) to facilitate effective communication from researcher to manager (but don't completely ignore uncertainty)

Reporting in support of Barrier #4 (Lack of certainty for actions under a changing climate)

1. Could be considered as more of a challenge than a barrier; climate not a primary barrier yet. Climate models need to be considered in ongoing resistance and resilience approach to sagebrush conservation

2. Explicitly define climate change in terms of what we do know and what remains unknown; for example, we know it's going to warm up, so work with that & other known's; focus on best info (temp increase) when assessing vulnerability

3. We need a multi-scale perspective to identify perimeters and hotspots within - before addressing climate change; identify hotspots and target action

4. Models are too coarse and difficult to apply to local settings. Need improved approached to using climate models for site specific actions.

5. Timing restoration to weather trend is a more immediate needs that consideration of longer term climate trend.

6. Develop seed mixes that include a range of precipitation tolerances as a way to hedge uncertainty of precipitation and soil moisture; also mixes that can withstand climate trends over 30-50 years

7. Social, economic, and environmental response to climate change all must be considered when planning and implementing restoration activities.

8. Use species distribution models to predict issues related to climate change; focus on cheatgrass persistence vs. elimination under a range of climate scenarios; build cheatgrass models based on soils and apply to various climate change scenarios to assess potential threats for future fire under various scenarios; explicit niche models for invasive species

9. Develop climate risk maps to capture probabilities and use in management

10. Need a strategic vision for where weeds are and how to prioritize/attack those weeds. This feeds into changes due to climate change because climate change may disrupt healthy ecosystems and provide opportunities for invasions.

11. We don't have good guidance on how to incorporate climate change resistance and resilience into NEPA or communicate potential difference between models, scenarios, etc.; we need better guidance on how to incorporate climate change into restoration policy and science.

12. Develop adaptation strategies to address climate change scenarios; recognize/acknowledge that climate change may disrupt healthy ecosystems and provide an opportunity for adaptable species (cheatgrass) to invade; climate change will shuffle the deck and support some species over others; adaptive strategies to interrupt or prevent invasive species

13. Identify climate variables that are most important drivers for invasive plant species establishment, persistence, and adaptability.

14. Redefine climate change to less sensitive terms - think about elements of climate change (like drought) that are more proximate and relatable to public

Group 2: Leadership, Coordination, and Communication Challenges and Barriers

Facilitator: Chris Rose, BLM
Note taker: Richard Kearney, GBLCC

Barrier: Lack of leadership, commitment and accountability has led to inconsistent institutional support and emphasis on invasive species management at nearly all levels of government (local, state, tribal and federal).

Discussion: A major obstacle to dealing with the challenge of invasive plants is a lack of leadership at the national level to work with state, local and tribal authorities to develop a cohesive strategy based on a shared vision. The National Invasive Species Council (NISC), a group established in 1999 under Executive Order 13112, has not succeeded in carrying out its responsibilities to develop and maintain an updated Invasive Species Management Plan nor to oversee the activities of federal agencies in carrying out invasive species management actions. The absence of a unified national strategy involving public and private organizations has caused many groups to see how their individual actions relate to those of other groups and contribute to a larger effort.

In addition to the above, a chronic lack of organizational and financial support continues to impair the scope and effectiveness of most government invasive species management (ISM) programs. Controlling the spread of invasive weeds is not seen as central to any agency's mission and, therefore, inadequate manpower and financial resources have been provided to this activity. For the control of invasive species to be most effective, federal agencies much establish ISM as a priority goal, dedicate the necessary resources to its achievement and hold leaders at all levels accountable for achieving ISM objectives.

Barrier: Coordination and collaboration with stakeholders and affected communities have been inadequate.

Discussion: Executive Order 13112 tasked the NISC to develop the Invasive Species Management Plan through a public process and in consultation with Federal agencies and stakeholders. The coordination and consultation to date has not reached the level needed to produce a cohesive ISM strategy. While there has been effective coordination at the local level in many places, this has not extended to the regional or national levels. Much greater emphasis must be placed on communication and coordination across organizational, geographic and social boundaries to achieve better efficiency.

Barrier: Lack of effective and strategic communications and engagement with target audiences (includes a need to identify target audiences, key messages, desired outcomes and common language in communications)

Discussion: An effective national ISM strategy will require the support of key federal and state legislators, private organizations, and the general public. To achieve this support, an overarching communications strategy is needed that includes target audiences, key messages, common names and definitions, etc. The goal of such a strategy would be to raise awareness and support for ISM activities among target audiences and the public. The strategy must include clearly defined goals, outcomes and measures of effectiveness.

Barrier: Lack of integration of social sciences into invasive species management to address landscape health problems.

Discussion: The sheer size and complexity of dealing with the invasive species situation will require changes in both public attitudes and individual behaviors. Integrating social sciences into ISM programs will be necessary to address the perceptions, motivations and social obstacles that have impaired the implementation of ISM**.**

Group 3. Policy and Regulatory

Facilitator: Matt Kales, USFWS

Flip charter: Terry Rich, BSU

Recorder: Todd Hopkins, GBLCC

Original Barrier: Lack of effective legal and regulatory framework for invasive species management.

(OK as worded. The framework exists, but *effective implementation* is difficult – different NEPA between agencies, etc.) Insufficient differentiation about levels of infestations and priorities for management. All agencies interpret NEPA differently – leadership issue and piggybacking across multiple NEPAs. Also, needs some teeth, like "no net increase" for 5 years, followed by a 5% reduction per year thereafter. Phased implementation or stepwise implementation is probably most useful approach.)

Original Barrier: Insufficient evaluation, compliance, monitoring, and enforcement.

Reworded Barrier: Insufficient incentives, evaluation, monitoring, compliance, and inconsistent enforcement.

(Focus is on incentives here. Enforcement can be a red flag for private landowners especially if the Feds won't abide by rules set for themselves = "Don't do as I do, do as I say"). Barrier is not having a National Policy that's not just federal, needs to be state-fed policy on invasives mgmt. Weed-free hay, soil, rocks for roads is an issue. How to get the states to consistently implement a unified approach?)

New Barrier: Lack of a National Invasive Species Policy with measurable outcomes led by a single responsible entity.

Too many "invasive species cooks in the kitchen." One leader for all is needed

New Barrier: Lack of clear roles, responsibilities and coordination of organizations at multiple levels.

Suggested that NISC should define these roles and responsibilities. "SG is the poster child for the failure of a national invasive policy".

New Barrier: Lack of a consistent and effective approach for appropriating funding tied to a comprehensive invasive species and restoration goal.

A streamlined processes for moving funds among and between agencies, states, and cooperating partners, to accomplish invasive species goals. Challenge is quickly and efficiently moving the money where it can be most effective – to a public or private entity

New Barrier: Insufficient effectiveness monitoring tied to adaptive management.

Monitoring for some endpoint or threshold – not just for monitoring sake

New Barrier: Lack of consistent and transferable data on invasive species.

(Science out there that is not getting into the regulatory framework)

Group 4. Program Management and Operational Capacity

Facilitator: Alan Clark, UT DNR

Note taker: Lindy Garner, FWS

This Breakout Session was composed of almost all federal agency personnel. There was no representation for private landowners or tribal representatives. There were about eight state personnel, at least three county representatives, one extension agent, and at least one or two non-governmental representatives for about 45 people.

As we went through each barrier, comments from each sub-group were captured.

Barrier: Highly variable management prioritization of high risk invasive plants;

Programs do not emphasize sagebrush restoration when targeting invasive plants across the range of the GRSG

Emphatic agreement with the first half of the barrier statement regarding variable prioritization, but felt second half of statement was more relevant in that no one was following up treatment with restoration. Yet, knowing that, they felt the first most important barrier was the lack of prioritization, or all-hands-on-deck attitude.

Most of the group felt the second half of the barrier statement should be taken off and concentrate on this issue of prioritization.

Priorities and responsibilities are not well defined. Some deal with any or all-invasive plants while some only address them if they are listed as a noxious weed. Significant concern by states and others that invasive plants should be addressed, not just cheatgrass or just annual grasses; felt it should be a broader approach of invasive plants threatening integrity of sagebrush grasslands, and need to have priorities and responsibilities much better defined.

Most of group agreed to cross out second half of barrier statement, but if not going to cross it off or separate it, then the narrative needed to better capture and discuss this issue of differing management emphasis across jurisdictions. Felt strongly that this is a huge issue of varied mandates for treatment priorities, much less whether there is a comprehensive restoration program, so we just don't get emphasis on sagebrush grasslands yet. (Public versus agriculture versus shrub steppe versus recreation leading to varied mandates)

There is a big difference of how much emphasis is placed on treatment projects between invasive plants and noxious weeds. Within a state the noxious weed lists are coordinated but across states there are different lists and different priorities. They felt the barrier is lack of specific risk assessment and prioritization being supported at local levels. Since many invasive annual grasses are generally not listed as noxious weeds they don't get prioritized for use of resources, or can't utilize state resources because of state weed laws requiring them to only use resources on listed noxious weeds. If going to require states and counties to do something on non-listed invasive plants then there must be additional, new funding.

A new barrier is need to have local input on noxious weed list, or need local input to put priorities in place regardless if the species is on the noxious weed list.

Context of barrier as stated is the importance of scale to set shared priorities

Agree with taking out second half

Yes, agree with barrier. The current process of state or fed list is a regulatory approach and maybe issues like species not being on the lists requires a different approach. How do we make species not on noxious weed list a priority, how can states and counties legally spend resources on these species, what other mechanisms can we develop to coordinate with everyone for these species to be a priority.

Need different approach for invasive annual grasses. Is terminology or the lack of understanding of terminology the barrier…

Note takers comment: As we started to go to the next barrier, all groups mentioned and agreed that they found all the current barriers as relevant, they just often felt the narratives as lacking description of the issue, or were "off-the-mark" a bit about the issue.

Barrier: Lack of internal structure and capacity for weed management programs at all levels

There is not "a lack of" they felt it was Inadequate and inconsistent internal structure, capacity, (and felt it important to add culture and accountability) for weed mgmt. at all levels

One group re-wrote the statement as Lack of internal structure, capacity, culture, and accountability for weed mgmt. at all levels

"Limiting" internal structure; we have some so not lacking, just not enough. They wanted to separate fuels mgmt. in the body of the narrative. Strategies section may need to be on long term strategy rather than annual appropriations and think about regional mitigation strategies to go after invasive weed treatments

Added "inconsistency in structure" response of not having a cookbook for what a good invasive species program should look like. We lack definition of what are the foundational elements. There is no value put on native rangeland ecosystems, need institutionally higher value placed on those ecosystems then would more likely be able to show capacity needed (so new barrier? of no value or solution is to explain we need to show the value); "Inadequate" instead of lack of and "inconsistent"

Lack of stand-alone emphasis at all levels for invasive species (hear about fuel and fire and moving targets) but we are showing this initiative for weed management should be the focus but they are always changing and no funding for weed mgmt.; lack of accountability but accountability pretty high at local level and discuss the differences among the levels

Need to discuss how this applies to private entities when talking accountability

What do we mean by adding "culture"; corporate culture, org culture, field office culture, and having accountability from bottom all the way to the top because right now differing accountabilities among all levels of federal government

Barrier: Lack of federal funding at the field level, which transfers risk to state and local governments

Reworded Barrier: Inconsistent and inadequate federal funding at the field level, which transfers the burden to state and local governments to get treatment work accomplished on the ground

Inadequate and inconsistent

Reduced federal funding…understanding not changing the barrier, just editing; many don't like the word reduced

Don't like "transfers risk" to increasing the burden or just scratch the entire second half of the statement and just say lack of consistent federal funding; could say inadequate and inconsistent federal funding at the field level

Lack of consistent and focused federal funding at base level. Federal agencies are always shifting funds between pots, since discretionary. We need streamlined, line-item, consistent funding at local level for comprehensive, base program

We need to show the importance of viewing invasive species management with same urgency as wildfire. Talked about what a program should look like, how do we define a comprehensive program? There is a concern that if we don't re-align programs for comprehensive staff, well-defined priorities based on invasion ecology and restoration that even with more funding, if put to the current programs, we may just spend more money on failures.

Just say lack of federal funding and keep it simple

Talk about federal funding has certain colors and discourages us from working holistically; call a spade a spade

They questioned if there is money there if we channel it correctly; key is mechanism by which you increase it, do you shift it with a priority or never prioritize and just not enough money, therefore the lack of funding is true

"not enough federal funding….", wants to leave "which transfers the burden to the state and local levels

Barrier: Inconsistent and fragmented prevention operations

Reworded Barrier: Inconsistent, fragmented and undervalued prevention operations

Didn't really like the word "fragmented"

"prevention operations" are just under-valued attitude; is the term too subjective;

Agree the term "under-valued" highlights the real issue and adds an important concept to the statement

Barrier: Lack of an effective early detection and rapid response (EDRR) system across the landscape

One person had the odd feeling that this doesn't fit in an invasive annual grass document because already so bad, but he was coming from Great Basin area and others jumped in and said it is an issue for eastern portion and some areas of the great basin. They also re-iterated that we should be talking invasive plants, not just annual grass.

Problem is actually lack of emergency funding, NEPA and lack of systematic surveys (monitoring) to "know" when and where any invasive plant is an EDRR species or not. Likely the lack of funding, NEPA and monitoring are another set of barriers; felt authors needed to address monitoring, NEPA and emergency funding in narrative or as solutions to this barrier

What about changing "effective" to "consistent"; often we can be effective, but only as long as money is there, but if money goes away or is inconsistent then cannot be effective long term

Consistent means stability, ongoing, the effectiveness is in eye of beholder and depends on their definition of success; effective is a subjective term because measure of success may differ,

What do we do with EDRR, we don't have time or funding, and not time for following through, it is lack of execution of EDRR; and consistency takes all of that into account

Disagreement on whether the word of effective coming out or staying in;

Ineffective can be a variety of reasons like consistency, lack of funding, design, capacity therefore think effective better word

Minority report: felt strongly by some that word consistent should be in ("felt undervalued") instead of effective or at least in addition

Barrier: Inadequate restoration strategies, implementation, and approaches

The second half of the first barrier is covered here…that is why the group felt the restoration aspect should not be in the first barrier of this section and left only discussing the prioritization component

Question was, has NEPA been addressed? Yes,

For some targeted restoration NEPA is not a barrier, but if restoration inadequate it could be just because NEPA was not done

This barrier and its wording was not near specific enough to please most of the group. They felt restoration meant a lot of different things to different people, so they felt that it should be reworded to "inadequate strategies, NEPA implementation, and approaches for restoring resistance and resilience; what are you restoring to…so thought there was ambiguity, and maybe looking at it as a programmatic barrier would help that

Is this barrier mainly addressing programmatic aspect so no need to address the science of restoration here? There is inadequate of getting it done, or is it inadequate tools, methods and information? They felt more of programmatic structure to address restoration; there is an overwhelming barrier to a successful approach; keep this as a programmatic barrier but recognize there is an operational barrier handled in the other group

Felt the science group, not program level, should look at problems of restoration to see if looking at weed programs, e.g., restoration may not even come into play on weed treatment projects, one would then have to know whether entire area invaded and may need to just contain versus some areas do restoration but only if feasible

Not change the wording but realize weed programs are geared for treatment overall and first, rather than restoration like fire programs. However, there can be a restoration component if the infestation is extensive and broad in scope, and so need to also deal with the barrier that many weed programs don't have comprehensive programs that include restoration after treatment (but this one was discussed in earlier barrier).

Take out the word NEPA

~~Inadequate strategies, implementation, and approaches for restoring and maintaining resistance and resilient landscapes~~. Maybe keep this one now because we don't have enough capacity in current programs

Maybe remove the word resilience because sometimes just maintaining or protecting; also from site scale sometimes just resistance trying to keep; restoration is an ambiguous term depending on time scale, if use word resistance and resilience you make it more powerful;

Current weed programs just don't use a restoration component, they only focus on treatment

Reworded Barrier: Current weed/noxious/invasive plant programs have a disproportionate focus on treatment. ~~over restoration~~ (they would prefer if it was a comprehensive program that included methods of follow through for restoration, rehabilitation, or re-vegetation)

Concern is that counties or whomever don't recognize restoration as a key part of a weed program and that is hurting us; but there was a concern counties don't get funding for that and mandate is to treat

Maybe change restoration to ecosystem management

Huge component of weed program is restoration or rehabilitation and if we aren't doing that then we need to fix it; if talking restoration then have to think about different sites because some places not restoring just re-vegetating and word restoration not correct word because just site rehabilitation

Maybe …focus on treatment over achieving long-term objectives

Still a barrier in that they are not comprehensive weed programs in their ability for restoration, lack of expertise, and lack of capacity

~~Inadequate strategies, implementation, and approaches for restoring and maintaining resistance and resilient landscapes.~~ Maybe keep this one now because we don't have enough capacity in current programs and treat it as a minority report; need comprehensive holistic programs\

New Barrier: Inadequate restoration expertise and capacity in weed programs

New Barrier: Lack of consistent collaboration between federal and non-fed partners. This may go in another report area

New Barrier: Lack of prioritization for invasive species management on the part of agency leadership. If had stronger upper level support would help increase funding

New Barrier: Lack of a national priority being placed on shrublands and grasslands (we had healthy forest, could we not have a healthy grassland restoration act)

Litigation…major challenge…so gun shy…help find way to build better defensible plans; Litigation on federal actions on federal lands and affects funding availability

Concept or paradigm shift where fire dollars or suppression dollars don't view annual grasses as a higher risk compared to other fuels, so lot of fire money for fuel reduction but no money used to treat weeds; so barrier

Current NEPA regulations are a poor fit for invasive species management needs

Summary

7-Highly variable management prioritization of high risk invasive plants;

28-Inadequate and inconsistent internal structure, capacity, culture and accountability for weed mgmt. at all levels

30-Inconsistent and inadequate federal funding at the field level, which transfers the burden to state and local governments

7- Inconsistent, fragmented and undervalued prevention operations

4-Lack of an effective early detection and rapid response (EDRR) system across the landscape

23-Inadequate restoration expertise and capacity in weed programs

2-Current weed/noxious/invasive plant programs have a disproportionate focus on treatment

3-Lack of consistent collaboration between federal and nonfederal partners.

4-Lack of prioritization for invasive species mgmt. on the part of agency leadership

2-Lack of a national priority being placed on shrublands and grasslands

1-Litigations of federal actions on federal lands

1-Suppression funds don't view 1 hour fuels as highly as woody fuels for prioritization

10-Current NEPA regulations are a poor fit for invasive species management needs

APPENDIX II:

Raw Notes for Developing Actions to Address/Resolve Challenges and Barriers breakouts, Wednesday November 18, 2015

Group 1: The Great Basin -

18 November 2015, Morning Session – Great Basin

Facilitators: Sandy Gregory, BLM; Joan Suther, BLM;

Recorders: Todd Hopkins, GBLCC; Dawn Davis, FWS

Assistants: Priya Nanjappa, AFWA; Mackenzie Case, BSU)

Charge to the Group

#1 Review the Challenges and Barriers and establish which one pertain to the Group's Topic area.

#2 Rank the Challenge and Barriers in order of priority for the topic.

#3 Develop actions necessary to address the challenges and barriers.

#4 If possible, develop an over-all ranking of actions.

#5 Prepare a list of the top 3 short and long-term actions to report to the entire group the following day.

SMART principles:

Specific

Measurable

Achievable

Relevant

Timebound

ISSUE 1 – INFORMATION MANAGEMENT & SCIENCE

Barrier 1 – Lack of Emphasis on Surveys, Inventories, & Monitoring Activities

Group 2 (Sherry):

Short-term goals: (achieve by Nov 2016): 1) Consistent data collection and methods/protocol; 2) Consistent reporting format for all organizations; 3) Long-term funding source for all data collection and management;

Long-term goals: 1) Focus on funding that needs to be separate from sage-grouse and fire; 2) public awareness campaign is needed; 3) standardized data collection system for data sharing and accomplishment reporting.

Group 1 (Matt Germino):

Short-term goals:

1) Cross-walking data types (county vs. Federal) and identifying common threads (e.g., presence/absence; ways invasives are distributed i.e., cheatgrass is different than forbs); how to aggregate data; consider how data are rolled up by states for leks and can we draw an analog from that for invasives? Iteratively set up objectives for the data to ensure data is collected correctly.

2) Data structure and organization (including metadata).

3) Need a consortium triggered by MOU that engages administration that incentivizes the collection and sharing of data; motivated through rewards

Long-term goals:

1) Developing ways of engaging citizen science to get collection underway; technological advances using cell phone aps (e.g., to upload photos).

2) Communication and outreach for tool develop to advance monitoring.

Group 3 (Jason Pyron):

Long-term goals: 1) Long-term funding and standardized approach; 2) Need a long-term standalone program responsible for beginning to complete restoration; program would also define success; Managing livestock grazing and permits associated with it to protect seedings

Short-term:

Define appropriate terms thru the creation of a common glossary

Develop a range assessment ap that can be implemented by the average citizen

Identify important/key questions that inventory and monitoring data would support future decision-making

Identify and require an appropriate % of ESR and/or restoration budgets to direct to monitoring.

Long-term:

Commit to provide direction and fiscally support for monitoring and implementation; develop data collection and information management for invasives that is on par with what we have w/ fire; identify core data needed to prioritize and inform decisions; identify fund, and develop tools for developing remote sensing for invasive grass management;

Identify 4-5 core questions that need to be answered following every land management project involving invasive species, i.e., drives adaptive management

Barrier 2 – Failure to Re-establish Desired Perennial Vegetation

Group 1 (Shawn Espinosa):

Develop guidelines for treatment adaptive management triggers to assess success/failure

Prevent losses of seeding/planting investments; specifically re: resumption of grazing before bunchgrasses are mature enough to w/stand; Develop tools to assess bunchgrass readiness to assess tolerance to grazing

Develop grass banks to increase flexibility and ensure restoration success (retirement, buy out of permits); would allow permittees a place to go during big fire years and would ensure seedings were viable

Establish nurseries; ensure growers seed prices; by 2018

Use best available data to determine pre-disturbance vegetation data; by 2018

Use and testing of the FIAT process

Group 2 (Sherry):

Short term:

Baseline data of existing plant communists at a landscape scale – compile existing data Jornada, AIM, DIMA, etc…

Establish a committee to evaluate the effectiveness of new technology in re-vegetation and seeding methods

Establish line item funding by FY18 for standalone weed program

Improve on existing seed storage capacity, and availability and storage capacity for bare root/plant materials

Improve local distribution of seed and other native plant material and ability to store them

Consistently availability of herbicide for weed treatment

Long-term:

Develop a reliable seed source of geographical appropriate and suitable site adaptation for restoration.

Establish a large-scale vegetation map so we have baseline and priorities for restoration

Funding to support restoration of native plant communities

Research to support adaptive management

Establish clearinghouse for reporting (e.g., WRI)

Barrier 3 – Inadequate Collection, Retrieval, and Sharing of Invasive Plant Data

Barrier 4 – Lack of Certainty for Actions Under a Changing Climate

ISSUE 2 – LEADERSHIP, COORDINATION, AND COMMUNICATION

Barrier 1 – Government Coordination and Emphasis for Invasive Species Management is Insufficient…

Group 6 (Philip Milburn):

Short-term goals: 1) regional all lands all hands coordination meetings related to invasive species specifically (e.g., Utah) – all levels of representation; improve implementation across all jurisdictions; 2) Lack of capacity at finer scales in terms of who does the coordination; capacity needs to be increased and coordination needs to be defined in job duties 3) Database is inadequate – cross-walk or develop new databases; Significant hurdle in Federal regulations, MOU, etc. moving forward.

Group 4 (Ted Koch):

Short-term goals: 1) Adding to performance plans of managers of all levels requirement to maintain or trend toward native plant communities; 2) Develop strategy from national strategy for the Great Basin; 3) Task NISC to simplify figure 2 on page 26 of the WAFWA weed report

Long-term goals: 1) Establish base/permanent funding at adequate levels; 2) integrate the NISC Great Basin strategy from above to longer term strategies linked to long-term goals (e.g. uselink to Sec Order 3336)

Group 5 (Katie Powell):

Short-term goals: 1) Develop strategic work plan to address invasive annual grasses in the Great Basin based on FIAT prioritization so we are not starting from scratch and not working across entire Basin; 2) Develop local work plans to implement FIAT projects; 3) Development of consistent prioritized mechanism for dissemination of funds; 4) collaborate with all partners to strategically implement projects across jurisdictional boundaries

Long-term goals: 1) Develop future plans for other invasive species issues within sage steppe habitats; 2) collaborate with all partners to convene and leverage available funding sources; 3) obtain consistent, sustained funding to implement these strategies, potentially thru a regional or national MOU

Barrier 2 – Very Limited Coordination and Collaboration with Non-traditional Stakeholders

Group 6 (?):

Piggy back on sage-grouse local work groups or create new work groups to engage locals; local work groups could develop work plans that could be aggregated to a regional level; ties to recommendations from first barrier of all hands all lands concept.

Barrier 3 – Lack of Effective Communication and Engagement with the Public

Group 5 (Katie Powell):

"Beat the Cheat" Campaign; need to bring in marketing skills to develop national/regional campaign that can also be applicable to local area

Use other models (e.g., public health); small tangible steps to make a difference

Engage stakeholders in effective communities to roll-out FIAT plans

Dedicate staff time at local level to communicate and collaborate with communities

Ensure that biologists/range specialist are engaged w/ weed specialists

Re-align priorities

Group 6 (?):

State level communications coordinator to develop newsletter and host annual field trips to tour areas affected by invasive species and garner support for funding

Initiate weed awareness campaigns; check stations for invasive weed seeds

Barrier 4 – Low Level of Public Awareness

Group 4 (Steve Hanser):

Combined barriers 2-4

Short-term:

Engage social scientists and other publics; requires a cultural change; looking at social movement behind the change and recognizing the scope of the problem

Start engaging social media to generate support among the public

Group 6 (?):

Initiate weed awareness campaigns; check stations for invasive weed seeds

ISSUE 3 – POLICY AND REGULATORY

Barrier 1 – Lack of Effective Legal and Regulatory Framework for Invasive Species Management

Group 8:

Short-term goals: 1) Assemble comprehensive list of laws, policies; task existing groups with coordination; 2) reward local level coordination – look for examples that are working; 3) Look at structure of SO 3336 and LUP Amendments and task the existing groups to address invasive species in a coordinated way;

Long-term goals: 1) Explore the incentive structure to address invasive species; 2) create agency policy to coordinate data sharing; 3) as mitigation crediting services develop, integrate invasive species component as an essential component of mitigation crediting

Need to coordinate internally/externally, streamline funding, reviewing consortium models to facilitate across state funding.

Support NISC to establish policy with measurable outcomes.

Utilize WAFWA MZ conservation teams to develop regional landscape level prioritization for invasive weed and restoration planning; funding through a multi-program channels

Group 7 (Jay Kerby):

1) Cross-state coordination of CWMAs; 2) Develop additional regulatory support for re-occurring investments (SO does this for BLM but there is a need for other partners like NRCS/SGI to address priority actions); 3) collaborative targeting and information sharing across boundaries/agencies

Group 10 (Sarah Kulpa):

Short-term goals: 1) Use national EDRR framework to help develop interagency frameworks (templates) that can be adapted for each state; 2) re-assess the criteria for what is "weed free"

Long-term goals: 1) Quality control for weed free that inform and set a standard for weed free forage laws. 2…Land management agencies need to be a part of the mission to treat non-natives. Feds need to set the example 3) For all agencies at the national level, have a program area and an appropriation for funding invasives (not under other programs). Other organizations can still participate but there is a need for a central pool of funds to pull from like a National Interagency Restoration Center (NIRC)

A: Needs to be development of a national policy for invasives that include and socio-economic evaluation; need to convince people the value of perennial grassland

Need to commit funding to invasives

C: Direct funding code for invasive species

Nat'l leadership should coordinate funding needs similar to fire; if Barrier C is addressed there would not be a need for Barrier D

D: Prioritize ease of transfer of funds and expand existing authorities outside jurisdiction when working toward similar goals

E: Develop/establish simple monitoring protocol to see if we are meeting goals; consider controls in treatment design that do not affect project goals

F: Identify where there is overlap; Federal agencies need to be able to share data and establish a geospatial database which would give us the ability to track trends in invasive species

Group 9

Short-term goals:

Reduce redundancy at national and regional levels; maintain groups that are functioning or re-organize so they are functioning.

FICMNEW recreate a mission statement and sign an MOU or other tool to focus on consolidating or strengthening policy

Connect FICMENW to state and regional committees to focus more like fire/fuels programs – promote resiliency in areas that are functioning and restore infested areas as opportunities arise

Long-term goals:

Focus policy and funding at the landscape level. Planning and management to make landscapes more resilient/resistant minimizing spread of invasions and restoring infested areas

Identify places where integrated teams work and use those places to develop BMPs; develop partnership coordinators to develop concept of multi-scale organizations (by place, not agency)

Barrier 2 – Insufficient Evaluation, Compliance Monitoring, and Enforcement

New Barriers

Group 8 (Jay Kerby):

National policy w/ a defined geographic boundary; outcomes are strategic plan and simplify diagram of weed management responsibilities

Prioritization of geographies critical for weed prevention; Nat'l Intact Landscapes (NIL Weeds); biophysical/bioclimatic modeling to project forward so EDRR can be more effective

Within 1-3 years expand the service first concept to enable shared invasive species goals

ISSUE 4 – PROGRAM MANAGEMENT AND OPERATIONAL CAPACITY

Barrier 1 – Highly Variable Management Prioritization of High Risk Invasive Plants

Group 11 (?):

Combined highest priority barriers

Long-term goals: 1) develop a strategic plan w/ all partners at a region scale for comprehensive pest management work; 2) work to develop a funding agreement (at the DC level)

Short-term goals: 1) convene a workshop at each state and work with county weed supervisors; use as a central focus for strategic planning at the local level; prioritize treatments at local level.

Lumped Barriers

Short-term: Hold annual workshop to address available funding, identify needs, etc.

Long-term: Develop a statewide strategic plan to address how we will manage weeds across all ownership; stress actions to be taken such as type of treatments, restoration, funding mechanisms and sources, capacity, development of expertise, EDRR, new tech implementation, knowledge transfer, post-grazing management.

Group 13 (Terry Rabot/Don Kemner):

Long-term goals:

Find a revenue stream including congressional support

Dedicated program toward weeds

Private land needs; additional NRCS funding dedicated towards funding to increase capacity of SWCDs (goal = 75% of districts w/in next 5 years)

W/ recent RODs, BMPs should address weed control where development is occurring; state management plans should address this issue on state lands; how is this being addressed on private lands (regulate at state or county level?)?

Short-term goals: ensure that a consistent proportion of federal dollars that are appropriated…dollars are set aside for operation capacity

Group 12 (Sue Phillips):

If structure/capacity could be addressed in a coordinated way from the Federal level to state to county that structure could help identify a reliable funding stream. Federal money could come down through USDA/DOI to counties; Funding would need to create reliable multi-year funding (e.g., 10-yr dedicated funding); Ensure new funding does not rob Peter to pay Paul; Have stakeholder groups identify funding sources that are dedicated to these efforts.

Short-term:

Determine strategy for stakeholders to address and lobby for new funds; establish consistent funding for long-term projects that is made available directly to states for weed removal

Identify and prioritize 3 yrs worth of projects to treat and restore lands using a FIAT-like approach; infestation overlays with GRSG habitat

Establish a simpler network structure

Long-term:

Create valid targets for GRSG management areas to implement before next FWS status review

BLM & FS to utilize RACs; long-term culture changes

Effective long-term control of feral horses

Barrier 2 – Lack of Internal Structure and Capacity for Weed Management Programs

Barrier 3 – Lack of Federal Funding at the Field Level, Which Transfers Risk to State and Local Gov'ts

Barrier 4 – Inconsistent and Fragmented Prevention Operations

Barrier 5 – Lack of EDRR

Barrier 6 – Inadequate Restoration Strategies, Implementation, and Approaches

Wednesday Late Afternoon Session 11/18/2015

Charge to the groups:

Task #1. Tables were asked to develop strategies and actions that will lead to work on the ground in the Great Basin to address invasive weed threats.

Task #2. We asked each set of tables that had worked on the same topics to work as a larger group and select their top three long-term and short-term actions. This was a consensus activity, not a vote. There were four tables in each of these larger groups.

Task #3. The groups were asked to articulate these actions on new flip charts that would be shared with the entire 100+ group.

Task #4. Last, each person received 4 dots and they were asked to vote on their top two short-term and top two long-term actions.

Task #1

Group 1, Table 1

Develop guidelines for treatments that contain triggers for adaptive management

Prevent losses of seeding and planting investments, especially regarding resumption of grazing before bunchgrasses are mature enough

Develop metrics for assessing bunchgrass readiness to tolerate grazing

3. Establish grass banks for flexible and restoration success

Through retirement or buyout of grazing permits

Establish new nurseries across GB with incentives for set prices on seed by 2018

Use best available info to establish pre disturbance vegetation condition by 2018

Use and testing of the FIAT process

Group 1, Table 2

Short:

Baseline data of existing plant communities on a landscape scale

Evaluate the effectiveness of new technology in re-vegetation and seeding methods and complete a tech transfer

Establish line item funding by FY18 for a standalone wee program

Improve on existing seed storage and capacity

Establish more storage capacity for rooted plant materials

Improve local distribution of state and local plant material storage

Not consistent avail of herbicide to treat invasive weeds

Long

Develop geographical reliable seed source for restoration

Establish large-scale vegetation mapping for baseline vegetation data and priority areas for protection

Long term $$ to support restoration

Promote research re-vegetation methods in support of Ag

Clearinghouses for project reporting like WRI in UT

Group 1, Table 3

Short:

Define appropriate terms though common glossary

Long: Commit to provide direction and $$ at the National level for completion of survey inventory and protocols but have local flex for implementation

Develop data collection and management. for in on par with the fire work

ID core data needed to prioritize and inform decisions

Identify a funding tool for remote sensing of invasive grass mgmt.

Short:

Develop range assessment application implemented by the average citizen (app)

Identify important key questions invasive and monitoring data would support for future decision making

Identify and require minimum percentage of ES&R or restoration budgets for monitoring

Long:

ID 4-5 core questions to answer following every mgmt. project associated with invasive species for adaptive management

Group 2, Table 4

Short:

Engage social scientists to help effect change and public awareness

Engage the social media to help public understand the change

Group 2, Table 5

"Beat the cheat" Kick Cheat Gr-ass"

Short:

Bring in marketing folks for national or regional scale education campaigns

Engage public and stakeholders using models from public health which empowers the public

Engage stakeholders during implementation of the local FIAT work plans

Dedicate local staff time for communications and collaboration with communities

Ensure biologists and range managers are engaged with local weed experts

Each agency could re-align some portion of their priorities that have been identified in the local/regional work plans

Group 2, Table 6

Short:

Create and engage local work groups that focus on invasive weeds. Invite all stakeholders from ranchers to county commissioners, local elected officials, etc…

Have a state-level communications coordinator for quarterly newsletter to media.

Host field trips for local/state legislators to areas affected by invasive species to educate them and garner support for funding

State and county agencies and local workgroups initiate weed awareness campaigns (e.g., WY does this) using billboards, public service messages, weed free zones, etc…

Long:

Aggregate the local work group plans up to a state level plan with members of all federal and state land management agencies.

Group 3, Table 7

Have a national invasive species policy with a strategic plan for the GB with measurable outcomes and responsibilities

Priority geographies for National Intact Landscapes (NIL)

Biophysical or bioclimatic modeling for weeds so we know what is coming

Short:

Expand the Service first concept to enable shared invasive species goals

Group 3, Table 10

Develop national policy for invasives including a socio-economic evaluation

Convince Congress to put $$ for invasive like they do fire

Create a National Invasive Policy and Plan and fund it

National leadership coordinate on funding needs (like Fire does)

Prioritize the ease of transfer funding between organizations

Establish core metrics for effectiveness monitoring and have monitoring be part of all projects

Develop simple standardized protocol for effective mon

Consider controls in treatment design that don't affect the project goals

ID where overlap is on invasive data to ID core metrics across agencies

Fed agencies need to share data and have database on invasive

Track trends in invasive species data

Group 3 Table 8

Short:

Develop a UAV policy across agencies to modernize inventory, monitoring, enforcement, and compliance

Long:

Coordinate on streamlining funding and use and application

Reviewing of consortium models for pooling funding and partnership organizations

Support NISC to establish policy with measureable outcomes with policy statements from professional groups

Use WAFWA management zone conservation teams to develop regional landscape prioritizing for weeds, and then use this for a funding program

Group 4, Table 11

Short:

Hold an annual statewide workshop on all weeds to address funding, treatment needs to create a work plan for the fiscal year until a longer term strategic plan is completed

Long:

Long terms statewide strategic plan for control of noxious and invasive weeds including all stakeholders to address how will manage weeds collectively across all ownerships to achieve control and reduction. The plan should stress actions to be taken with respect to:

Types of treatments

Prioritization of treatments

Accountability for all treatments

Restoration in conjunction with treatments

Funding mechanisms and sources

Operational capacity

Development of expertise

Early detection and response

Monitoring and evaluation

New technology and implementation

Contracting for "knowledge transfer"

Communications plan

Post treatment grazing management

Group 4, Table 9 (?)

Develop integrated veg. management teams to complete NEPA planning at a landscape scale

Identify places where this works and has been done

Long: use those places (above) and develop BMPs

Look across all organizations to see shared positions for Integrated Pest Management (inventory what's there)

Long: Partnership coordination to support these multi-scale organizations

Group 4, Table 12

Short:

Strategy for stakeholders to lobby about specific weed issues

Identify and prioritize 3 years worth of projects in GB to treat and restore lands

Long:

Establish long term funding, user-based stakeholder funding

Long:

Create valid targets for each SGMA to implement weed restoration projects before the nest status review for SG

BLM and FS to utilize the RACs as more than a formality. Look for opportunities to involve RACs in invasive species projects like prioritization

Effective long-term removal of horses and burros to be at or below AML

Group 4, Table 13

Short:

Additional NRCS funding dedicated towards the soil conservation districts to increase capacity of cooperative weed management areas (CWMA) to increase weed control on private lands. Goal: Accomplish this for 75% of districts within 5 years

Long

Establish programs and staff at district or field offices dedicated to management of noxious and invasive weeds including restoration and monitoring

Additional NRCS and CWMA capacity and infrastructure to provide weed control and education to meet identified needs.

Question: Development: how are weeds from development being addressed at state or county levels?

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Task #2

Top Three Long and Short Term Actions - by Group

Group 1

Short:

Establish a larger aggregated data set. Establish a committee w/ in 6 months – what data is out there crosswalk the data for a building block to use the data

Establish standard data collection metrics and reporting system,

Develop and implement metrics for bunchgrass readiness to tolerate grazing

Long:

Develop new of innovative restoration techniques and tech transfer to do it

Develop seed storage and propagation capacity – improved seed storage, rooted stock, and incentive structures for doing this.

Group 2

Short:

Convene local work groups to develop implementation plans and leverage existing resources to address invasive annual grasses that mirrors a regional strategy and the FIAT prioritizing process

Develop a national strategic communications plan/campaign that incorporates social media with consistent key messages tailored to the local scale including consistent definitions – what invasive are etc…

Long:

Develop a collaborative 5 yr budget plan that supports regional and local work plans

Establish mechanisms for period data sharing tech trans, successes and failures for AM funding a policy and communications

Group 3

Develop national policy with start plan with socioeconomics, geographic barriers, MOUs, inventory of invasive species policies, ID and designate intact landscapes

Modify existing coordination bodies to focus on invasive species

Promote strategies like Service first for ease of movement of funds among agencies and outside partners

Group 4

Short:

Conduct annual state and regional workshops

Utilize a FIAT-like process to prioritize weed treatments

Develop a strategy for secure funding for weed management at multiple scales (federal state and local levels).

Deal with the spaghetti map of the WAFWA report

Long

Develop stateside or regional strategic plans

Establish valid weed mgmt. targets. Goals to achieve or the WAFWA mgmt. zones for targets before the next FWS review

Use the RACs to help in providing information and education out to stakeholders regarding decisions

Establish personnel and programs dedicated to weed management at the district field office level

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Task #3.

Read out top short and long-term actions to the entire group.

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Task #4.

Great Basin Breakout Session Final Votes

Charge: *Develop strategies and actions that will lead to work on the ground in the Great Basin to address invasive weed threats.*

Top short-term actions include securing funding at multiple scales, mechanisms for moving the funding to priority organizations, development of a national policy and strategic plan, and development of metrics for bunchgrasses that indicate grazing tolerance. While development of the strategic plan (#2 above) can occur in the short term, implementation of plan will occur in the long term. (# Votes shown in bold)

Develop a strategy for secure funding of weed management at multiple scales (37)

Federal, state and local level

Contributions by stakeholders for fees in use arrangements

Developing national policy with a strategic plan for invasives that includes (24)

Socioeconomic values

Geographic barriers

MOU to develop organizational structure and roles

Inventory of existing policies

Identify and designate and prioritize national intact landscapes (NIL)

Best management policy

Streamlined process to pool/utilize funds across fed, state, private, local, NGO, etc. towards invasive A species management goals (like "service first") (22)

Develop new and implement metrics for assessing bunchgrass readiness to tolerate grazing (22)

Top long-term actions included developing new restoration techniques and technology transfer, establishing mechanisms for data sharing, and stepping down the national strategic plan to regional or statewide scales.

Development of new or innovative restoration techniques/species and associated technology transfer (49)

Early serial species (native/annual/forb)

E.g. Seed pillows, coatings

Establish a mechanism for periodic data sharing, tech. transfers, successes and failures for adaptive management, funding, policy and communication (18)

Develop statewide/regional strategic plans involving all stakeholders to address weeds (17)

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Group 2. The Eastern Portion GSG Range

Eastern Portion of the Range Summary, Western Invasive Weed Summit (11/18/15)

All Barriers were considered relevant in the eastern portion of the range but different in how they should be considered and implemented. There is a difference in the urgency, fire risk, and ecological drivers of the eastern portion compared to the Great Basin, but that does not discount the need for attention and resources.

So the entire group felt strongly an umbrella statement needed to be made

<u>OVERARCHING CONCERN IDENTIFIED:</u>

Despite the fact of the significant urgency in the Great Basin…

The eastern portion of the range is discounted by some, yet invasive species are a significant and growing problem that needs focused action to protect the best remaining intact sagebrush habitat. There is a tremendous amount of opportunity to deal with this cost effectively if we act now. We must recognize that there is significant value of treating infestations (small and diffuse) before an ecological threshold has been crossed;

ounce of prevention is worth pound of cure; keep clean areas clean; prevention areas and maintenance of quality sagebrush grasslands.

Due to the persistence of extensive intact habitat the eastern range comprises the best prospects for long-term GRSG survival

Ranked the barriers and selected the top four:

26-Lack of federal funding at field level transferring the burden to state and local (Operational Capacity and Program Management)

20-Lack of emphasis on surveys, inventories, and monitoring activities; Inadequate collection, retrieval and sharing of inv plant data (Information Management and Science)

18-Lack of internal structure and capacity for weed mgmt. program (Operational Capacity and Program Management)

16-Lack of leadership, commitment and accountability have led to inconsistent, institutional support and emphasis on invasive species management at nearly all levels of govt. (Leadership, Coordination, and Communication)

Group then developed significant list of short term and long term actions but there were duplicates and few conflicts of whether one should be considered short term or long term. So broke into 3 bigger groups to reduce duplicates and resolve conflicts. Then voted.

Top 3 Short-term Actions

Concentrate treatments in areas that have a high probability of success-13 (Operational lack of funding)

Standardize data collection and reporting across all jurisdictions for survey inventory and monitoring-13 (Information Management and Science)

Develop overarching vision and national strategy to include all levels of stakeholders, NISC, ISAC-6 (Leadership, Coord, and Comm)

Top 3 Long-term Actions

Line item in budgets for invasive species management will be in place-18 (Operational Lack of Funding)

Implement agreed upon standards for database reports/outputs accessible to all partners for data sharing/exchange/analysis-12 (Information and Science)

Workforce planning to establish full-time positions dedicated to invasive species management (especially at the field level)-8 (Operational Lack of Internal Capacity)

Other Short Term Actions

Leadership Coordination and Communication

Facilitate continued collaboration of natural resource professional and stakeholders; develop MOUs/interagency team

Deal with accountability issues through performance measures

Establish a high-level interagency/partner team that will guide the implementation of the action plan from this summit, achieve alignment across jurisdiction and lead to successful invasive species management in the eastern region of the sagebrush ecosystem

Operational Lack of Funding

Education on why legislation is needed to deal with current funding barriers

Re-allocation of funds towards invasive species priorities

Begin process to establish a line item budget for invasive species management with federal agencies and research

Operational Lack of Structure and Capacity

Establish inventory of existing operational resources; identify additional needs

Create educational campaigns for all levels to build support for increased structure and capacity

Select focal sage grouse areas across the eastern region as pilot/demo areas for interagency stakeholders collaboration

Bring on interns/seasonals focused on cheatgrass management within priority focal areas

Create shared invasive species positions within sagebrush ecosystem that are funded by multiple groups

Information and Science

Identify existing data and its utility moving forward

Identify existing databases to collect and track treatments, restoration and conservation efforts at landscape scale

Ask management questions to help guide researchers and field staff to collect necessary data metrics

Hire more seasonal staff and re-emphasize priorities from leadership to commit staff time resources to invasive plant management in sagebrush ecosystem

Convene task force to develop set of minimum standards for data collection and reporting; include definitions and scale

Request additional resources to achieve increased survey/inventory/monitoring to meet desired (predefined) goals and/or thresholds

Define restoration success/effectiveness; how do we define success, success after 1 year, 5 years, vegetation response?

Prioritize and commit to surveys, inventory and monitoring

Other Long Term Actions

Operational lack of federal funding

Identify new revenue streams (not dependent on appropriations) (likely at state level or non-federal)

Develop approach for appropriating funding tied to a comprehensive invasive species management; line authority funding to invasive species management so that it cannot be assessed or re-directed

Consider adjusting reclamation bonds to restoration bonds

Operational lack of internal capacity

Restructure with clear responsibilities for all parties with follow-up or accountability

Leadership, Coordination and Communication

NISC/ISAC (restructure/reemphasize)

The team will have developed a common EDRR framework, monitoring, and data sharing protocols as well as a common research agenda.

Implement methods to measure outputs and develop appropriate responses

Implement organizational structure for deployment of adequate personnel and resources

Engage the Western Governors Association and federal leadership to get long-term buy-in

Develop National invasive species policy with measurable outcomes led by NISC

Information and Science

Create and implement communication strategy to engage targeted partners

Prioritize and commit to surveys, inventory, and monitoring

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Group 3: WAFWA Invasive Plant Management and GSG Conservation Report

Top 3 Short Term Actions:

1. Convene a group (list specific entities) to identify ways to streamline the NEPA process for invasives projects, including the potential development of Categorical Exclusion authority, programmatic analyses, templates, training, strike forces, etc. [This action was redrafted from a set of 4 similar actions proposed by

different groups (groups 2, 3, 5 and 6); Edit marks: “WAFWA, WGA, NASDA, and other partners” were suggested entities] (11 votes)

2. Convene a meeting with county, state, and federal agencies and other appropriate groups working with sage-grouse priority areas to identify existing databases and define and establish a data exchange mechanism and objectives. This effort should be pared with a corollary initiative to develop scientific standards, protocols and methods for invasive species assessment and monitoring to be used for (a) determining the most critical locations for prevention emphasis, and (b) accurately tracking spatial dynamics of weed populations over time as well as the impact of weed treatments on those dynamics. [Group 3 deferred an action to support this action] (10)

3 (tie). Form and fund a program for restoration of at risk core sage-grouse habitat requires multi-discipline approach at a scale relevant to sage-grouse [Edit marks: “(i.e. EQIP, BAER)”, “(G4 #2)”, “Proj Mgt Op Capacity Recommendation 1” and “like the scale up of Utah’s Watershed Restoration Initiative”] (9)

3 (tie). Create a cooperative initiative for protection/restoration of sagebrush ecosystem, led by states and feds and informed by stakeholders, and identify a funding mechanism to incentivize the cooperative. (9)

Other Short Term Actions (number of votes):

Do a stakeholder analysis including an assessment of values and motivational traits (the results of the study can be a stand alone product and create a campaign) (6)

Develop incentives through third party, state, federal, or Farm Bill-like programs to provide financial support for treatments and post treatment restoration. (5)

WWCA, WAFWA, WGA and federal agencies create a national strategy for sage-grouse priority habitat and invasive plants with measurable outcomes (15 mo) [Note added: “Leadership Coord Rec. 2”, and “see Group 6 #1”](5)

Task NISC at the Department level to coordinate a high level multi-federal agency working group and charge them with a comprehensive review of past invasive species management plans and develop a new plan based on the review with obtainable tasks and timelines. Develop a template for the establishment of regional invasive plant management strategies that consist of assigned responsibilities, funding, invasive plant assessment s and action plans. Link regional strategies to GRSG. [Note added: Recommendation: Program Management and Operational Capacity] (4)

Fund infrastructure for regional seed storage and production of locally adapted seed [Note added: “Info Mgt Sci B2] (4)

Team to analyze and synthesize available information re: prevention, treatment, and restoration post treatment for cheatgrass and medusahead (i.e., Chambers et. al). (3)

Develop funding mechanisms at state and federal levels to significantly increase program capacity to accelerate invasive plant prevention and control activities at all levels with the goal of achieving a measurable net

reduction of priority invasive plant populations each year and curtailing the exponential rate of spread of those priority populations, across the range of the GRSG [Note added: “Operations Recommendation 2 “not modified”] (3)

Clear expectations for federal land managers with specific, measurable criteria for performance plans that are focused on prevention, restoration and improving ecological conditions. (3)

Revise ESR/BAER policies to directly include researchers in planning process and engage researchers in CWMAs. (3)

Increase amount of funding for the NFWF Pulling Together Initiation from the current federal agency sponsors, and increase the number of new sponsors (federal and non-federal) and increase funding within agencies for CWMA support. [Group 4 cited “Operations Recommendation 5 - modified: added specific elements” here] (2)

Connect with existing state/local weed education programs to develop outreach strategy and unified message regarding sagebrush ecosystems. (1)

WAFWA and their partners should identify the scale and scope of the cooperative initiative for protection/restoration of sagebrush ecosystem (i.e., sagebrush ecosystem or invasive plant management or landscape scale or national scale) (1)

Top 3 Long Term Actions:

1. Establish dedicated funding for invasive weeds with measurable outcomes that include treatments, survey, and monitoring. (12 votes)

2. Establish a national EDRR funding mechanism (source) with consistent long-term high (adequate) level of funding. [Note added: “Group 4 (Operations) Recommendation 3 modified”] (11)

3. Identify gaps for locally adapted seeds and fund contracts for productions. [Info Mgt Science B2] (9)

Other Long Term Actions (number of votes):

Direct research to identify and develop new techniques and technologies to treat cheatgrass and medusahead and restore areas post-treatment. (8)

Revise NISC Management Plan (draft) to incorporate GRSG priorities for invasive weed management and the applicable strategic action items from this weed summit. [Note added: “Group 2 (Leadership) Recommendation 2 “modified action”] (8)

Develop the compelling story for each stakeholder and produce an education campaign [identified as an extension of a short term goal] (7)

Direct monitoring and information collection to documents ecological conditions and changes over time – tied to adaptive management (5)

Implementation of the recommendations from the meeting of county, state and federal agencies including a comprehensive review of all of the barriers associated with data sharing including a centralized system to access the data. [Recommendation: Information Mgmt] (4)

A new approach needs to be developed and funded to provide for Environmental Analysis. A National System for Environmental Analysis should include consistent funding and a format that can address invasive species threats at all levels and across all landownerships, particularly within the range of GRSG, in a timely and efficient manner. [Recommendation: Program Mgmt & Operational Capacity] (4)

Stakeholders should identify their goals and strategies for the cooperative initiative, which will allow them to compete for funding to achieve actions [identified as an extension of a short term goal] (4)

Frame and fund programmatic watershed and invasive plant management that links weed management goals and habitat maintenance and restoration focus areas across local state and federal lands. (3)

Forums/methods/tools for research-management information exchange (2)

Form a strategy for sage-steppe outside of sage-grouse core habitat (restoration and control) [Info Mgt Science B 1&3] (2)

Realign the process for development of and reporting on the National Invasive Species Management Plan with the directives set out in E.O. 13112 [Recommendation: Program Mgmt & Operational Capacity] (1)

Develop a nationally consistent public education and awareness program for the prevention and management of invasive species, similar to the national fire prevention program campaign, coordinated across public and private sectors. [Note added: “Group 4 (Operations) Recommendation 4 “not modified” here] (0)

APPENDIX III:

Think, Pair, Share Process

All of the groups used the think, pair, share, strategy. It is a cooperative learning technique that encourages individual participation and is applicable when working in large groups and level of experience. Attendees think through questions using three distinct steps:

1. **Think:** Individuals think independently about the question that has been posed, forming ideas of their own.
2. **Pair/Groups:** Individuals are grouped in pairs or sub-groups to discuss their thoughts. This step allows students to articulate their ideas and to consider those of others. The questions can determine the pairs (the pairs can be a smaller group with more than 2 people)
3. **Share:** Pairs and/or sub-groups share their ideas with a larger group, such as the whole class. Often, students are more comfortable presenting ideas to a group with the support of a partner. In addition, students' ideas have become more refined through this three-step process.

This process is important as individuals need many opportunities to talk in a linguistically rich environment. Researchers have found that an individual learning is enhanced when they have many opportunities to elaborate on ideas through talk (Pressley 1992).

The think, pair, share strategy increases the kinds of personal communications that are necessary for individuals to internally process, organize, and retain ideas (Pimm 1987).

In sharing their ideas, individuals take ownership of their understanding and negotiate meanings rather than rely solely on one authority (Cobb et al. 1991).

The Information Management and Science Challenges and Barriers group each were assigned a Barrier and were asked to answer the following questions in there break out group.

Additional benefits of using the think, pair, share, strategy include the positive changes in groups self-esteem that occur when they listen to one another and respect others' ideas. Individuals have the opportunity to express higher-level thinking skills from their peers, gain the extra time or prompting they may need, and gain confidence when reporting ideas. In addition, the "pair" step of the strategy ensures that no one is left out of the discussion. Even an individual who is uncomfortable discussing his or her ideas still has an audience in this step. Finally, while the strategy may appear to be time-consuming, it makes discussions more productive, as individuals have already had an opportunity to think about their ideas before plunging into group conversations.

Four Barriers were discussed within the Information Management and Science Challenges and Barriers. Each group was asked to answer the following questions.

1. Are the Barriers relevant?
2. Are the Barriers stated properly, if not determine appropriate modifications.
3. Are there additional challenges and barriers that need to be articulated, if so draft the appropriate language.
4. Rank (if possible) the challenges and barriers in order of importance (what needs to be addressed first etc.)

Cobb P., T. Wood, E. Yackel, J. Nicholls, G. Wheatley, B. Trigatti, M. Perlwitz. 1991. Assessment of a problem-centered second-grade mathematics project. National Council of Teachers of Mathematics. 3-29.

D. Pimm. 1987. Speaking mathematically: Communication in mathematics classroom, London, United Kingdom. Routledge and Kegan Paul. p. 40-45.

Pressley, M., P.B. El-Dinary, I. Gaskins, T. Schuder, J. Bergman, L. Almasi and R. Brown. 1992. Beyond direct explanation: Transactional instruction of reading comprehension strategies. Elementary School Journal, 92:511-554.

Western Invasive Weed Summit
Follow up Questions

Invasive Plant Management in the West:A Scientific Assessment
Dr. Roger Sheley

1. "Prevention depends heavily on detection of small isolated hard-to-find weed populations. Where are we with methods to help us do that efficiently, especially in large landscapes like the Great Basin?"

Sheley: ***Dr. Sheley has been impacted by the recent takeover of the Malheur Refuge. Please check back.***

2. "Do You Think the Great-brown Grezins plan can be incorporated, using p model or supported by grazing leases on BLM?"

Sheley: ***Dr. Sheley has been impacted by the recent takeover of the Malheur Refuge. Please check back.***

3. "Dr. Sheley talked about the 5% success rate for restoration of degraded habitat. Are there ongoing developments in seed research technology that can increase the success rate?"

Dr. Alan Clark: I listened to that comment with great interest because if true we have wasted about $158 million of the $165 million we have spent in Utah on restoration and rehabilitation over the last 10 years. Our goal is to restore the structure and function of a site, not necessarily the same species. We monitor many of our projects and have had independent scientists look at the results over hundreds of projects. Our success rate is much higher, but it is difficult, can take multiple tries, and most of all takes time. More than once a seeding that would be called a failure in years 1-2 ends up being a success in years 5-10.

4. "Can you speak to appropriate timing of restoration using seral stage appropriated material?"

Sheley: ***Dr. Sheley has been impacted by the recent takeover of the Malheur Refuge. Please check back.***

5. Opening- Around the year 2000, Wisclove et al, published several documents out of the Interior Columbia Ecosystem Management Project that called for the identification and protection of excellent sage-grouse habitat. Now, 15 years later how well has this strategy – their #1 recommendation – been implemented. If not, well, why not?

Sheley: ***Dr. Sheley has been impacted by the recent takeover of the Malheur Refuge. Please check back.***

6. A few years ago, I heard a botanist argue that we should be seeding early successional forbs, many of them annuals, rather than climate species likes sage and blue bunch – why don't we hear more about this strategy?

Sheley: ***Dr. Sheley has been impacted by the recent takeover of the Malheur Refuge. Please check back.***

Landscape Perspective on Invasive Plants and Sage Grouse:
Understanding Impacts and Managing Risks
Jeremy Maestas

1. Has the susceptibility of sage grouse to predation from predators such as ravens and coyotes changed due to landscape disturbance?

Maestas: Habitat fragmentation from a variety of disturbance factors has favored opportunistic species, such as ravens, to the detriment of sage-grouse. Of course, sage-grouse are a prey species that have evolved with some level of predation-caused mortality but the impacts of predation become more pronounced in fragmented landscapes. Long-term solutions to dealing with this challenge include maintaining and restoring large, intact sagebrush landscapes and reducing predator subsidy sources.

2. If perennial bunch grasses are the key to resistance, hasn't over a century of cattle grazing permanently damaged these ecosystems? (Cows Eat Grass)

Maestas: Improper timing, intensity, and duration of grazing can damage individual bunchgrass plants, which is why range management specialists and livestock producers base grazing management systems on principles designed to protect perennial grass health. Just because cows eat grass does not mean ecosystems undergo permanent changes (i.e., irreversible state shifts in the state-and-transition model framework). When broadly assessing impacts of livestock grazing, it is important to separate historic grazing practices (pre-Taylor Grazing Act of 1934) from current grazing management.

Historic overgrazing prior to regulation and modern range management certainly caused ecological degradation severe enough in places to cause stable state shifts, the signs of which are still on the landscape today. In other places, overgrazing may have had more short-term impacts but ecosystems largely stayed in the sagebrush-bunchgrass state. While examples of improper grazing do exist today, most modern livestock management seeks to balance livestock use with carry capacity of the land and plant growth requirements to better protect key forage species, primarily perennial bunchgrasses, which is much less likely to lead to permanent ecological state changes.

3. Sage Grouse numbers have shown significant fluctuations throughout the past 100 years. Has there been any research, or discussion into what the historical triggers were, that had a positive or negative influence on population trends?

Maestas: Indeed, sage-grouse exhibit population cycles (roughly on 10 year interval). While there has been some research and discussion, drivers of the population cycle are not well understood. While populations do fluctuate, there has been a general decline in the overall population trend observed over several decades.

Overview of WAFWA Report
Kenneth Mayer

1. How are you incorporating comments and input provided? Will there be a revision of this report incorporating input from professionals?

Mayer: The original WAFWA Invasive Plant Management Report (2015) was reviewed by more that 30 resource specialist and scientists familiar with invasive plant ecology and management. Inputs from these reviewers were incorporated into the final publication. There are no plans to re-visit this report and make additional changes. Rather, the results of the Western Invasive Weed Summit will be summarized and provided to the public. This summary will include the updates of the Challenges and Barriers provided in the original WAFWA Report and the recommended actions to address these by the Summit Attendees.

Panel: Management of Invasive Plants Across the Range of GSRG
Ted Koch
Dr. Chad Boyd
Alan Clark
BLM

1. We frequently hear about 'moderate grazing' and 'appropriate grazing' being compatible with GRSG habitat conservation and restoration. How would you define 'appropriate grazing' being compatible with GRSG habitat conservation and restoration? How would you define appropriate grazing?

Koch: "Appropriate grazing" could mean compliance with BLM/FS Proper Functioning Condition and Rangeland Health standards, and the sage-grouse Vegetation Standards table in the revised RMP; it could mean compliance with NRCS standards; and in the southern Great Basin it ultimately means providing healthy riparian habitat and stopping expanding cheatgrass dominance.

2. "Language is important" - why do we refer to non-native grasses as desirable, at best they are acceptable and it is native perennial grasses, forbs and sagebrush that are desirable.

Boyd: I think of non-native perennial grasses such as crested wheatgrass as pragmatically desirable. My goal as a research ecologist is to help increase our success with native species to

the point that non-native perennials are not even a consideration…but we aren't there yet. Right now, using crested wheatgrass, we can realize orders of magnitude higher post-seeding seedling density (vs. natives). Given that perennial grasses (native or otherwise) are our best defense against exotic annual grasses, I think they have high value in increasing resistance to annual grass invasion on low to mid elevation sites.

3. How do you ensure local approaches use the best science in the decision-making?

Clark: Our (UT) goal in rehabilitation and restoration projects is to ensure that we use sound methods and good science not necessarily the best science because many of our challenges are complex and not completely understood or researched.

With that said, we employ an interactive peer review process for all project proposals. Range scientists at the Great Basin Research Center, as well as experienced managers on regional teams and those with various agencies, are involved in the initial review of the proposals. Any participant can ask questions or make suggestions through the on-line interactive database process and the exchange is tracked in the comment section and available to others to follow and review. Each proposal is then presented at an open meeting of the regional team with further opportunity for questions and responses before the ranking committee ranks it. This open process fosters improvement in projects.

Finally, we emphasize monitoring project results and hold regional team field trips during summer to look at the results. Project managers want to be successful and are always looking for suggestions from peers and examples of other's successes. In addition to the project review process we hold workshops open to any participants where scientists present the latest findings on selected topics to improve our knowledge of what works when and where.

4. Focusing on bunchgrasses as a key component to compete with invasive annual grasses in fairly flat areas is common; however, there are places for forb and shrubs in re-vegetation plans on steeper terrain for erosion control (both wind and precipitation) as they compete with broadleaf invasives and fix nitrogen into depleted soils.

Boyd: I have nothing against using broadleaves and shrubs in restoration. In fact, we do a fair bit of research trying to figure out how to better establish sagebrush on difficult sites. I focused on perennial bunchgrasses because, pragmatically speaking, they are the plant functional group that best competes with exotic annual grasses, and exotic annual grasses are the biggest restoration/management problem we face in most low to mid elevation sites across the range of sage-grouse.

If the goal is to increase resistance of a plant community to annual grass invasion, that goal will be best realized by promoting the abundance of large perennial bunchgrasses. Other plant functional groups will be more important for other goals (e.g., planting sagebrush in sage-grouse winter habitat).

General Questions

1. We need to advocate for integrated pest management approach across vast landscapes and access to best tools-- streamline the federal process for agencies to use new herbicides-- Test promising herbicides and break log jam in approving new classical biological control agents (e.g., eriophyid mites for cheatgrass).

BLM: As we begin working more and more across the landscape, our Federal, State, and County partners will all need to work together using an Integrated Pest Management/Integrated Vegetation Management approach when addressing noxious weeds and other undesirable plants. These efforts must combine cultural and physical practices, along with biological and chemical options in such a way as to minimize potential economic, ecological, and sociological impacts. Increased coordination when conducting species inventory, working through project planning, and the actual implementation of treatments will lead to a more effective means of addressing the challenge at hand.

In addition to a new potential herbicide active ingredient option, the recent registration of a biopesticide, the D7 strain of Pseudomonas fluorescens, sold under the trade name D7®, along with an additional strain ACK55, which is currently under review for registration, offer a unique management tool. Both biopesticides are for the management of three invasive grass species, downy brome/cheatgrass (*Bromus tectorum L.*), medusahead rye (*Taeniatherum caput-medusae* [L.] *Nevski*), and jointed goatgrass (*Aegilops cylindrica L.)*.

In light of the critical situation federal western lands are facing with two of the three listed invasive grasses and their susceptibility to wildfire, the Secretary of the Interior made a request to the EPA for a special consideration regarding the review of the registration package for the Pseudomonas fluorescens strain ACK-55. In addition to the biopesticides, work is being done to identify potential classical biological control agents for the management of invasive grasses. Though work is progressing, the Technical Advisory Group (TAG) has not received any petitions regarding any available candidates for consideration.

Mechanical options have been used for years in addressing this issue, timing and various types of equipment have proven to be effective under certain conditions, timing and with different plant species. Targeted grazing has been incorporated into the management of several invasive species, including downy brome/cheatgrass. Researchers are working on identifying ways in which each of these various management options can be incorporated into a management process.

2. How do we best address fire Paradox? Fire management creates a difficult paradox- whereas we need to protect and conserve large, intact sagebrush dominated ecosystems (from fire and other landscapes alterations) our activities might make it worse (e. g., weeds in green lines), and fire is an important ecosystem process that can help maintain native perennials and systems productivity.

BLM: We manage the "fire paradox" by focusing on managing vegetation. If we have healthy native sagebrush ecosystems, fire can effectively play its traditional, healthy role. If we have ecosystems influenced by invasive species such as cheatgrass, fire will likely facilitate the further

decline of those ecosystems. Focus on the vegetation, not the fire. Then when fire burns; make informed decisions about whether and how to manage that fire.

Management of wildland fire, and the related program of fuels management, should be grounded in the resistance and resilience concepts described in US Forest Service General Technical Report RMRS-GTR-326 (Chambers et al. 2014). Ecosystems that exhibit high inherent resilience may have opportunities for ecological benefits where fire plays a more or less natural role. In these systems, benefits of fire could include reducing conifer expansion and stimulating perennial plant response. Conversely, ecosystems having a low inherent resilience may have far fewer management options. In these scenarios, disturbances such as mechanical fuels treatment or wildland fires may promote type conversion of sagebrush to annual grasses and remove sagebrush seed sources over large areas.

The extension of ecological principles to restoration is also critically important. Recovery of biological integrity of a burned or disturbed site is challenging when threatened by invasive species. By using multiple entries to revegetate sites at the appropriate time, with genetically appropriate materials, adapted for local, or climate change adjusted conditions, potential to reach restoration success is increased. In summary, managers need to be mindful of ecological response when making fire management decisions.

Koch: We manage the "fire paradox" by focusing on managing vegetation. If we have healthy native sagebrush ecosystems, fire can effectively play its traditional, healthy role. If we have ecosystems influenced by invasive species such as cheatgrass, fire will likely facilitate the further decline of those ecosystems. Focus on the vegetation, not the fire. Then when fire burns; make informed decisions about whether and how to manage that fire.

3. Many of the speakers talked about site/ecological potential but didn't specifically mention Ecological Site Descriptions (ESDs). Do the speakers feel they are valuable tools for our work?

BLM: Absolutely - ESDs contain critical information for making informed decisions at the project scale. However, ESDs are not currently available for all areas. There are efforts underway to fill this gap. There are other sources of information available on potential vegetation.

The *Landscape Fire and Resource Management Tools Project,* better known as LANDFIRE provides numerous vegetation products for both existing and potential vegetation. In LANDFIRE, vegetation is mapped using predictive landscape models based on extensive field referenced data, satellite imagery and biophysical gradient layers using classification and regression trees. Vegetation products use NatureServe's *Ecological Systems* classification and the NatureServe Explorer website provides descriptions for each Ecological System including species, distribution and classification information.

The LANDFIRE website provides links to three potential vegetation files: Biophysical Settings (BPS), Biophysical Settings models and Descriptions; and Environmental Site Potential. BPS write-ups describe vegetation that may have been dominant on the landscape pre Euro-American settlement. BPS models and descriptions include state-and-transition models

representing pre-settlement reference conditions and the Environmental Site Potential write-ups describe vegetation that could be supported at a given site based on the biophysical environment.

In addition, LANDFIRE includes existing vegetation products. The Existing Vegetation Type defines community complexes. Existing Vegetation Cover describes vertically projected cover in the live canopy area for a specific area and Existing Vegetation Height depicts average height of the dominant vegetation. This information from LANDFIRE and NatureServe can help us update and improve existing ESDs and provide some base line information for developing new ones where ESDs do not currently exist.

Clark: I agree. Much of the discussion on seed mixes and treatment methods revolves around the ESDs for the project site.

4. Speaker made reference to the importance of scale with respect to both the needs of the Grouse as well as the need to increase our scale of weed treatments and restoration. Please expand upon the issue of scale.

Maestas: This is definitely a tough one to wrap your head around, but an important concept nonetheless. It is entirely possible to spend a tremendous amount of resources treating weeds and restoring high quality sagebrush patches with little-to-no measurable benefit for sage-grouse. Also, understanding scale is about recognizing that grouse use incredibly large areas during their life cycle and vegetation treatments seeking to benefit these birds must be comparable in scope.

Focusing collective efforts across private and public lands in one high priority region may be more beneficial than a thousand random acts of kindness scattered across the range to achieve the cumulative effect needed. Understanding the scale issue helps us manage expectations for project outcomes and better design strategic treatments of appropriate size to have a chance of producing meaningful benefits. Strategic efforts to manage invasive species in the name of sage-grouse conservation must start with a landscape assessment of what one is dealing with.

The scale issue is partly about understanding context (i.e., what does the watershed look like around your project area) and how that may affect your ability to meet objectives for benefiting landscape species like sage-grouse. The Fire Invasive Assessments (FIAT) was used to develop collaborative implementation plans to address threats to sage-grouse resulting from invasive annual grasses, wildfires, and conifer expansion in Priority Areas for Conservation (PACs) at a landscape scale.

By identifying the focal habitats within the six PACs, management strategies were prioritized (within or near these important habitats), by patterns of resistance to invasive annual grasses and resilience after disturbance, landscape sagebrush cover, and conifer expansion. Prioritizing weed management in a landscape that is otherwise intact is much more likely to produce near-term benefits than focusing efforts in highly fragmented areas that may require decades to become functional again. Using this approach, county, state and federal agencies are able to prioritize their funding, and manpower. We can stop cheatgrass at small scales. We need to transition to doing that over large scales.

Clark: Our program in Utah is called the Watershed Restoration Initiative because we emphasize restoration at the watershed or landscape scale. Very few of our projects are one and done type efforts. It is common for projects to have phases that last 5-10 years. We provide funding and support that ensures project managers are thinking big and, once funded, know that future funding is likely to continue. Our focus areas and project ranking system encourages other landowners and land managers to do similar projects on adjacent ownerships.

Koch: We can stop cheatgrass at small scales. We need to transition to doing that over large scales.

5. Annual Grasses are the big bully. Don't lose sight of the other invasives identified in the WAFWA report these invasive species were identified by on the ground manger as problems.

BLM: Yes, we talk about cheatgrass specifically because much of the public can identify with that better than, "invasive species," and because it's the most widespread and affecting species. Nevertheless other invasive species are also important to address.

It is estimated that there are over 50 million acres of invasive annual grasses on public lands in the Great Basin area and because of their role in changing fire regimes and the conversion of shrubland plant communities to annual grassland communities and the associated impact such conversion has on the local fauna, we should be concerned and identify management plans/programs to address the situation based upon a science-based effort utilizing all available management options.

A century ago we lost the native California Annual Grasslands to non-native annual grasses and without intervention we could again see community conversion of dryland shrub types at landscape scales. But annual invasive grasses are not the only species impacting public lands. Nonnative perennial forbs, along with invasive woody species are altering plant communities, though not on the same scale as the invasive annual grasses. But the impacts are just as pronounced and long term.

Over 32 million acres of other noxious and invasive weeds infest the Great Basin, Sage-grouse habitat, especially riparian habitats that see explosions of weeds like Leafy Spurge, (*Euphorbia esula*) or Russian Knapweed (*Acroptilon repens*) are extremely difficult to control once they have established and provide little benefit to the quality of sage-grouse habitat. Without restoration and proper management following treatments, other noxious and invasive weeds will immediately occupy areas currently infested with invasive grasses.

In the Great Basin our attention should focus on invasive annual grasses because of their role in changing fire regimes and converting shrubland plant communities to annual grassland types. A century ago we lost the native California Annual Grasslands to non-native annual grasses and without intervention we could again see community conversion of dryland shrub types at landscape scales. Non-native perennial forbs are converting plant communities at smaller scales. But they should not be ignored. Sage-grouse habitat, especially riparian habitats that see

explosions of weeds like Leafy Spurge, (*Euphorbia esula*) or Russian Knapweed (*Acroptilon repens*) are extremely difficult to control once they have established and provide little benefit to the quality of sage-grouse habitat.

Koch: Yes, we talk about cheatgrass specifically because much of the public can identify with that better than, "invasive species," and because it's the most widespread and affecting species. Nevertheless other invasive species are also important to address

6. Among all the "ologists" that are being engaged (range, science, fire science, ecology) are we engaging social scientist to help us engage landowners in collaborating on protecting and restoring sagebrush habitat? While there are challenges in the biological sciences, perhaps the greatest challenge is to engage people on the landscape.

Koch: Totally agree – engaging people is our biggest need and opportunity. Landowners typically engage in management only at the very local scale. The challenge to engage landowners at other scales requires understanding the context of the lands that individuals manage. For many years weed managers have engaged in programs at county levels and through weed management areas to try to incorporate issues of scale. The task now might be for weed managers to engage at even larger scales and coordinate priorities, and funding for treatments across priority sage-grouse habitats.

Social science and the engagement of multiple publics will be important in protecting and restoring sagebrush ecosystems. Technology transfer and information sharing is a foundational element of this goal. A number of existing partnerships must be built upon to best engage landowners. Science findings can be disseminated using programs such as the Joint Fire Science regional consortia and Landscape Conservation Cooperatives. On-the-ground accomplishments can be realized through Cooperative Weed Management Areas (CWMAs) and Conservation Districts. Partnership models such as the Sage-Grouse Initiative and Rangeland Fire Protection Associations are additional examples of existing groups that must be used to engage people on the landscape.

Clark: My experience is that the best way to engage people in these efforts is to put a successful project on the ground and let surrounding landowners see it across the fence and realize that the same thing could be done on their land and funding and assistance is available to make it happen. I do not sell projects. Landowners, land managers, and public land grazers engage their neighbors and peers.

7. Phasing in lower stocking levels and changing season of use helps success rates in rehab and restoration- How can we accomplish this within the rigid grazing regulations?

BLM: We are actively pursuing providing more grazing permit flexibility with those "Collaborative Ranchers" who have already demonstrated a willingness and ability to effect conservation on lands they graze. We will build this tool. Through the Secretarial Order, the BLM and other agencies are working to pilot the concept of targeted grazing as a tool to use outside of the normal grazing regulations. Instead we might potentially work through the procurement process and provide incentives to graze cheatgrass in specific areas during specific

periods of time. Newly seeded sites need adequate time to establish and recover after disturbance. Research collaboration between USGS, BLM and others is currently engaged in developing metrics to understand the resilience of newly revegetated areas. The focus of this work is on measurable aspects of vegetation that help determine the capability of an area to withstand grazing pressures and still provide the ecosystem goods and services at levels to sustain biological and ecological processes.

Koch: We are actively pursuing providing more grazing permit flexibility with those "Collaborative Ranchers" who have already demonstrated a willingness and ability to effect conservation on lands they graze. We will build this tool.

8. How will the various components of collaborative, public private, sagebrush conservation (life management, invasive species management, sagebrush restoration) come together and be managed going forward? Who's ready to lead the effort?

BLM: Going forward, the various components of vegetation management on public lands will come together in the land use planning process. We must be able to report on the success of our management actions in reaching our land use plan goals for vegetation. To be able to do that, we must have vegetation objectives for native plant communities in land use plans that are specific and measurable. The focus will be managing for specific native plant communities with measureable composition, cover, height, and bare ground components as well as community connectivity and patchiness. We must include adaptive management strategies that allow for change if specific objectives are not being met when monitoring data is evaluated for planning areas.

Secretarial Order 3336 helped to align many on-going efforts related to collaboration, research, and multi-agency management practices. A task force formed from the Secretarial Order developed a management strategy with taskings, action items, due dates, and responsible parties. Collectively, these components serve as a template for a coordinated effort related to sagebrush conservation. Beyond the Secretarial Order, it is noteworthy that federal agency cooperation has never been stronger related to the importance of sagebrush and sage-grouse conservation. This is evident in allocation decisions, research emphasis, and broad scale analyses which support conservation decisions.

Koch: A dearth of clear leadership is one of our greatest challenges right now. We all need to step up.

Clark: Our initiative in Utah has grown because we started with a few champions who could provide that leadership but not direction. We need to build collaboratives, where people participate because they get something from participating beyond what they bring. I think these types of efforts have to be bottom-up decision-making and management, not top down or it becomes too bureaucratic and competitive. The leaders have to take as their job to remove roadblocks, provide resources, and give credit to others.

9. Speaker made reference to the importance of scale with respect to both the needs of the Grouse as well as the need to increase our scale of weed treatments and restoration. Please expand upon the issue of Scale in this issue.

BLM: Understanding the scale issue helps us manage expectations for project outcomes and better design strategic treatments of appropriate size to have a chance of producing meaningful benefits. Strategic efforts to manage invasive species in the name of sage-grouse conservation must start with a landscape assessment of what one is dealing with.

10. We have consistently seen barriers and goals discussed this week as being similar to those addressed in Senate File 2240 and H.R. 1485 Will WAFWA make an effort to review the legislation and potentially support the effort based on the summit results?

Mayer: As a general rule, WAFWA does not take political positions on legislation, because it is an organization/association of multiple state wildlife agencies across the west and Canada. Hence, support or opposition of H. R. 145, for example, is the purview of the individual member states. However, WAFWA can and has offered technical reviews of the potential effects of legislation. To date, WAFWA has not been asked to review either Senate File 2240 or H. R. 1485.

11. FIAT - What sorts of NEPA Options are you looking at? Are there cross boundary options in the works- FS, BLM, and States?

BLM: Cross-Cutting Action Item 4 in Secretarial Order 3336 - An integrated Rangeland Fire Management Strategy is to "Develop and implement efficient and appropriate National Environmental Policy Act (NEPA) and other environmental compliance process." The teams working on this action have several tools that include templates for EAs and consultations that should be available to the agencies shortly. Agencies will be encouraged to work collaboratively across boundaries and NEPA can be done jointly. However, the decisions based on the NEPA have to be issued separately by agency.

12. FIAT - implementation areas cross-jurisdictional boundaries. Will the NEPA cover multiple ownerships? Including clearance (i.e., Archeology, ESA, ETC.)?

BLM: Whether the NEPA will cover areas that cross-jurisdictional boundaries or not will be a local decision. The respective field units are being encouraged to do so and in several cases, working in partnership is a criterion to receiving funding. The partnership effort can include working on the clearances as well. Given that the circumstances will be different for each project, these decisions have to be made by those working together on the project.

Currently, BLM field offices can prepare environmental assessments for local projects directly tiering to the 2007 Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS) and the Final Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report (PER). Other agencies can utilize the information within the documents by incorporating by reference the analyses and information in

the herbicide risk assessments, including the information within the Biological Assessment for the consultation in pursuant to Section 7 of the Endangered Species Act. All of the relevant information within the document can be used to complete an agency's own site-specific level analysis.