

FINAL MEETING NOTES



Idaho Sage-grouse Advisory Committee

November 29 and 30, 2011

Pocatello, ID

Attendance

The following individuals attended some or all of the meeting on November 29 and 30, 2011: Rick Baxter (BYU), Jon Beals (Idaho Governor's Office of Species Conservation), Chris Colt (USFWS), Neil Crescenti (Idaho Department of Lands), David Delehanty (ISU), Jack Depperschmidt (DOE), Dave Ellis (Challis LWG), Karen Fullen (Natural Resources Conservation Service), Gene Gray (West Central), Steve Goddard (Idaho Wildlife Federation), Steve Hanser (USGS), Neil Hillesland (Mountain Home group), Kristy Howe (ISU), Ron Kay (ISDA), Don Kemner (Idaho Department of Fish and Game), Sonya Knetter (IDFG), Zachary Lockyer (ISU), Rob Lonsinger (IDFG, South Magic Valley LWG), Paul Makela (Bureau of Land Management), Ty Matthews (USFWS), Rob Mickelsen (US Forest Service), Ann Moser (IDFG), Edmund Murrel (Shoshone Paiute Tribe), Rochelle Oxarango (Idaho Wool Growers), Wendy Pratt (East Idaho Uplands LWG), Jason Pyron (USFWS), Quinn Shurtliff (WCS), Kathleen Rapley (USFWS), Mike Remming (Jarbidge LWG), Mike Roach (US Senator Risch), Dean Rose (IDFG), Richard Savage (ICL), Patrick Seymour (IDL), David Skinner (North Magic Valley LWG), Alison Squier (Facilitator), and Natalie Turley (Idaho Power).

TUESDAY NOVEMBER 29, 2011

Welcome, Introductions and Review Agenda

Don Kemner welcomed everyone to the meeting and thanked everyone for coming. Alison Squier reviewed the agenda, asked if there were any additional agenda items (there were not) and led introductions.

Review SAC Purpose, Expectations and Establish Ground Rules

Alison reviewed the purpose and role of the SAC. The Idaho Sage-grouse Advisory Committee (SAC) was established in 2003 by the Idaho Department of Fish and Game to help all Idahoans, and especially the Sage-grouse Local Working Groups (LWGs) throughout the state, by making sure they have the funding, support, and information they need to put meaningful sage-grouse conservation on the ground. SAC members include representatives from all of Idaho's active LWGs, representatives of conservation groups, livestock industry representatives and representatives from state and federal agencies.

The SAC provides a forum for LWGs to work together to advise the state, share knowledge, and locate funding for sage-grouse conservation. The SAC also provides advice to the Idaho Department of Fish and Game Director and Commission on sage-grouse conservation and management issues, shares information and perspectives with other state and federal agencies, and Congress, and develops recommendations for sage-grouse conservation project funding.

Alison explained that the last time the SAC reviewed their working ground rules was in 2009, and asked the SAC members to establish new working guidelines for the group for 2011-2012. SAC members identified the following ground rules for 2011-2012:

- Raise your hand to speak
- Listen to other people
- Respect the opinions of others
- Don't throw verbal bombs
- Turn off your cell phone in the meeting
- Don't interrupt other people
- Stay on task, stay on subject
- No speeches

All participants agreed to abide by these ground rules.

Updates from Local Working Group Representatives and Other Participants

The following SAC members and other meeting participants provided updates:

- **Neil Hillesland** (Mountain Home) said they collared 11 birds from 3 leks. They are monitoring them every week. They are monitoring them on the ground and from the air. One collar fell off; 1 other bird was found dead. The collared females were nesting. They waited until they left the nest. They determined that all the eggs had hatched and did a nest evaluation and determined the habitat structure around the nest. After 2 weeks one of the hens travelled 2 miles; she lost her brood. Another hen they flushed had 3 chicks. During the summer they lost another male and one hen. When possible they flushed the birds and counted non-collared birds with them. They are continuing aerial and on the ground monitoring and are hoping to collar 12 more birds.
- **Ann Moser** (IDFG) added that folks at Mountain Home have been meeting about once a month. Mostly the group is working on educating themselves about sage-grouse and sage-grouse habitat.
- **Dean Rose** (Curlew LWG) reported that with their plan done interest in participating has diminished somewhat. At the last meeting the local County Commissioners came to seek input on the road location. They didn't have any projects this last year. The Forest Service and BLM are both doing work in the area.
- **Richard Savage** (ICA, reporting for Upper Snake LWG) we're down to 2 meetings per year. The last one was in June. The main thing the group has focused on is the hunting recommendation and dealing with ravens. Our group reached consensus that it was time to take action on ravens.
- **Jon Beals** (OSC) said they've been busy with lots of sage-grouse policy work. About a year ago BLM put out breeding density maps. After that folks started calling OSC. They started looking at different processes that are in place, the State of Wyoming has put together a core area strategy. OSC has been coordinating with surrounding states. There will be a meeting Thursday morning, December 1, at 10 am in the Capitol conference room in Boise. At least 115 people have been invited to visit with a representative from Wyoming (Bob Budd). This is being cast as an exploratory discussion to get input from lots of people and better understand what they've done in Wyoming and whether that model might work in Idaho.

- **Gene Gray** (West Central LWG) said they had their regular July picnic. The telemetry project ran out of money in August. They had an informal meeting in October. They haven't had another meeting this fall and may not meet in the winter, but they will probably meet in the spring. Gene provided a summary of NRCS (sage-grouse initiative) and other projects in they are working on in the West Central planning area. Those included a Sage-grouse Initiative (SGI) funded modified grazing system to create residual cover with deferred pastures during the nesting season (25,000 acres); modified fencing to exclude livestock from leks during breeding season including addition of new fences and removal of old decrepit fences (SGI funding); rehabilitation of 300 acres from annual grasses to native bunchgrass, forb and sagebrush (SGI funding); establish sagebrush and perennial grasses on 20 acres in introduced perennial grass stand (SGI funding); mark existing fences near leks (2,000 markers) and add ramps to 30 existing water troughs (SGI funding); convert 250 acres of alfalfa fields to perennial grass (crested wheat) and native forbs and allow sagebrush to establish; use Lawson aerator on 3000 acres; and sagebrush seeding and forbs in CRP stands (CRP funding).
- **Rochelle Oxarango** (IWGA) said there's not much to report for the wool growers. She requested that after the updates we add some additional discussion of the Wyoming core area strategy to the agenda.
- **Jack Depperschmidt** (DOE) said they are working on a candidate conservation agreement draft. At this point DOE no longer wants to construct a wind turbine complex on INL.
- **Rob Mickelsen** (USFS) said at this point they don't have a lot of on the ground things to report. Most of the discussion is at the Washington D.C. office level. They are figuring out a strategy for review of Forest Plans on sage-grouse habitat. If it is determined that the Forest Service needs to amend the existing plans or add conservation measures, they will figure out what to do at that point. This will likely occur on the Sawtooth, Curlew, Challis, and maybe Boise forests. At this point the overall approach is to rely on the BLM analysis.
- **Dave Ellis** (Challis LWG) said their meetings have become pretty sporadic. Because of facilitator funding issues, they are only meeting a couple times a year. The last meeting was in in late June. The next meeting is January 10. The LWG had a marking/telemetry project that was funded through the SAC. Dave wasn't able to get together with Vince Guyer prior to the SAC meeting to get an update on that. But based on information provided at the summer meeting it didn't look like they got that many birds. Through South Carmen Grazing association, they have changed grazing on one allotment. The changes weren't targeted specifically at sage-grouse but they have benefited tremendously in terms of additional residual cover for nesting. The association is also working on an additional fence on that allotment that was funded through the SAC. Dave said they should be able to get that finished next spring. Dave commented that his place is about the farthest north in Idaho where we have sage-grouse; he saw a sage-grouse behind his place this summer.
- **Wendy Pratt** (East Idaho Uplands LWG) said their LWG planning area is in the extreme southeast corner of the state. They got their plan done, which is good and bad. Wendy said she's discouraged because she's the only non-agency person that's left that comes to the meetings. She doesn't know how to get people to come. The northern part of their area where they are doesn't have many birds and is closed to hunting. The south part is where the telemetry study is going on. This spring they collared 50 birds and another 18 this fall. They did the aerial survey in the spring in the northern part of the planning area. The research is still going on. Wendy said the ranchers that she's mingles with are somewhat open and interested in learning about

what's happening. Maybe that's enough. They said they felt like they needed to meet four times a year to keep things alive. They are supposed to have their facilitator back in January. The IDFG representative has been facilitating, but it's not the same as having Wendy facilitate.

- **Rob Longsinger** (South Magic Valley LWG) said he echoed everything Wendy said. Their group is still working on their plan. They are meeting once a month although during certain times of the year they miss a month. They've had very little involvement from anyone but agency personnel. They have one sportsman who comes. Their concern has been how do we get folks involved. The group is missing a large constituency. It seems like it is the sage-grouse recovery groups whose own numbers are endangered. There was an article in the Magic Valley Times about this; unfortunately the author didn't include any information about how people could get involved. The group has been pursuing funding for sage-grouse habitat improvement projects. They are looking primarily at juniper encroachment projects. NRCS is contributing and RMEF has also received funding to support that project. One thing the group identified as a need, in addition to participation, was development of a monitoring project to look at the effectiveness of these habitat restoration projects.
- **Mike Remming** (NRCS, Jarbidge LWG) said that he is no longer with IDFG and is now working for NRCS as a soil conservation technician. He will be working with CRP and SGI. This is probably his last report as the Jarbidge LWG representative. Brad Lowe is currently facilitating the Jarbidge LWG. They finished marking fences this summer. Those fences are within one mile of active leks. Mike spent about 8 days on a tractor doing the Dixie harrow project. This work is to complete a project on state land that was started about 8 years ago. This time they were given an OSC grant to do the other half section. They changed the seed mix a little, beefed it up. The LWG is meeting in December and at that point will pick a new SAC representative.

Mike also mentioned that he'd talked to Rich Yankee from the Shoshone Basin LWG who couldn't make it to the meeting since his wife is sick. It was a bad phone connection but Rich said the LWG had written a letter in opposition to the China Mountain wind farm because of the migrational movement of sage-grouse in the area.

- **Paul Makela** (BLM) said that BLM recently announced the national initiative to amend most BLM land use plans within sage-grouse range. The idea is to get the resource management plans (RMPs) updated with current science etc. regarding sage-grouse. Since the SAC last met BLM has also completed the mapping or modeling of preliminary priority habitat areas as well as preliminary general habitat areas. That effort is going to help inform the resource management plan process, as well as provide spatial context for national interim policy while BLM is updating the resource management plans over the next few years. On a related issue, in November, the state Director issued an instruction memo triggering the annual update of the Idaho sage-grouse habitat planning map. Those edits will be made locally through the BLM offices. The final GIS data from the update will be once again posted on www.insideidaho.org for access by the public. One comment Paul said he heard the last few years from local BLM biologists, is that they don't get much input from other partners/agencies on those local habitat map edits. Paul said that if you're aware of any needed edits to work with the local BLM biologist to get those incorporated this year. Please try not to wait until the last minute. They have until the first week in February to get field edits done.
- **David Skinner** (North Magic Valley LWG) said he's not the usual SAC representative, but neither of them could make it to the meeting. He said their LWG is now meeting quarterly. They have a draft plan that's finished but they're still in the process of getting it finalized. They received

funding approval from the SAC to do a wintering grouse study. The proposed study was related to the relocation of a local airport. However, the EIS for that site has been cancelled. Also, there are quite a few larger SGI contracts being working on in the area. They still plan to move forward with the wintering study.

- **Don Kemner** (IDFG) said he's been working to try to find funding for LWG and SAC efforts. This week they submitted a grant application to BLM for funding for LWG facilitation. They hope to find out if that's approved soon. Don explained that that proposal is for \$10,000 to help with LWG costs. Earlier this fall IDFG finalized a grant with USFWS that will provide \$20,000 for LWG facilitation. He will talk about funding in context of the funding updates. In the BLM planning process that Paul referred to, part of that process includes a national technical team. This includes participation of folks across sage-grouse range including IDFG, BLM, range scientists, etc. A meeting of those people was convened at the end of August. They spent a week working on conservation measures that will be considered in the upcoming BLM process. That group will probably play additional roles as BLM roles out this planning process.
- **Natalie Turley** (Idaho Power) said Idaho Power has been working with state and Federal agencies to study the effects of tall structures on sage-grouse. Dr. Terry Mesmer put together a report on sage-grouse; he found that there hasn't been any peer-reviewed research papers published on the effects of power lines. They are working on coming up with research protocols. In April or so they got together with technical experts to try to come up with research protocols. Brett isn't here today because he is meeting with an oversight committee looking at this question on how to actually get this going on the ground, how to get funding, pick study sites, and look at effects across sage-grouse range.
- **Kathleen Rapley** (USFWS) explained that Kendra Womack (who has previously attended meetings with the SAC) resigned at the end of December to stay home with her baby. Jason, Tye and Kathleen are working together to cover for her for the time being. Jason is also still working on the CCA with INL. The West Central CCAA effort is currently at a standstill.
- **Karen Fullen** (NRCS) reported on the 2011 sage-grouse initiative. When the SAC last met Karen said she was excited that they had 3 to 4 times as many applications in 2011 as the previous year. She said they initially thought they maybe even had enough applications to spend all the funding. However, what turned out happening was that at that time field office was still looking at feasibility of applications. It turned out that many of those applications were on BLM land, but BLM didn't have a NEPA document in place so half of the applications dropped out. Under WHIP, NRCS funded 5 applications all in Washington County covering about 17,000 acres. Under the EQIP program they funded 28 applications on about 107,000 acres. They ended up spending \$1.7 million and sending back \$1.3 million. Some good news came in late June when they received funding under the Grassland Reserve Program covering 8 perpetual easements in the Pioneer Mountains. To help deal with BLM's NEPA situation for the future, NRCS has requested to be a cooperating agency. They are getting started with the NEPA work, it won't be done in time for the 2012 projects, but it will set us up for the future. They still have \$20 million of Grassland Reserve Program applications on the books.

In terms of 2012 funding, the Agriculture Department has an appropriation bill that's passed. The pot of money that pays for staff salaries and running the office has been cut again. They are still encouraging early retirement, buy outs, reducing staff where possible, and leaving positions unfilled. EQIP funding did get a slight increase; other programs are getting cut a little (except

conservation/stewardship). Karen said she thought we would probably never get all the Grassland Reserve Funding that we need.

- **Jason Pyron** (USFWS) gave an update on the Owyhee LWG since Donna couldn't make it to the meeting (Alison noted that Donna send in an update that she was going to read). They are finishing up mastication work. They are doing additional mastication on George and Donna's property. They are continuing to work with TNC on a project to identify a new methodology to measure shrub and grass canopy cover. It will be interesting to see how it comes out. Looking at whether they can find a better way to do line transects. They are also comparing the cost per acre of different techniques and using remote sensing information to figure out cost per acre.

Jason said that in the Challis area they got about 20 birds collared last year. They had trouble getting hens collared as usual. They're learning a lot about bird movements over mountains and large distances. They are looking to collar an additional 20-30 birds this spring with a focus on hens. They've been doing winter collaring as well. The idea behind all of this is to incorporate this information into the range wide NEPA analysis. They met with BLM staff and will be completing these evaluations from information gathered last summer and this summer. Hopefully that information will get wrapped into some regulatory mechanisms within the planning documents.

- **Donna Bennett** (Owyhee LWG) wasn't able to attend the meeting but provided the following update by email. The last Owyhee LWG meeting for this year of 2011 was November 17, with 19 attendees. At their meeting a year ago, they decided they needed to update their LWG Plan. Carl Rudeen, USAF and Michelle Kemner IDFG were nice enough to volunteer to look at the 2004 Plan and incorporate updates to it. At each meeting since then, they have presented additions to the Plan, until the November meeting when they presented the nearly completed copy. Carl and Michelle have also been updating the LWG brochure, at this point only the sections on funding and accomplishments still need work. Jason Pyron (USFWS), organized school tours of leks on April 13 and 20, and May 3. Students from Rocky Mountain High, Eagle High, Borah High and Rimrock High visited the Castle Creek Lek and habitat on Reynolds Creek. Representatives from the LWG went along on the tours. The LWG sponsored a field trip to tour the juniper mastication projects May 25. The interest in mastication is growing, with the ranchers as well as agency folks. Ranchers are willing to contract for mastication if money is available. They can see a possible solution, however small, to this problem. The Gateway West draft EIS has been a topic of discussion at each of the Owyhee LWG meetings, and with the LWG input the County drafted an alternative, which would bypass completely Sage Grouse leks and most of the private farm ground. Comments were due October 31. The two mastication projects are nearing completion. The project on Stanford's property two years ago has been a great success. The meadow grasses are coming back, even where the chips were heavy on the ground. The machine this time is smaller and works better on smaller trees, but the results are as good and in some respects better than, the track hoe. On both sites, the results have been great. Art Talsma, with The Nature Conservancy, has a series of video clips on the juniper mastication produced by Mountain Visions which will be available on an interactive website. The videos feature the actual mastication process as well as the justification for juniper removal. Two lop and lay projects using NRCS funds have also been developed. The results weren't quite as good as the mastication, the trees are down on the ground and now must either be cut into firewood or burned at a later date. The method is considerably cheaper than the mastication, but the visual result of the mastication is far better. They will be monitoring the ground water in the spring to see if the springs improve. The wetland meadow project at Jack's Creek is ready to

go as soon as the contractor can get started. We are hoping to have this done by mid December, depending on weather.

- **Edmund Murrell** (Shoshone Paiute Tribe) introduced himself. In 2010 the Tribe finished a study on the effect of West Nile virus on sage-grouse that was funded by USFWS. It was a 3.5-4 year study. They found out that the first year or two West Nile hit hard with a 30-40 percent decrease in population but they started to bounce back and now mortality is closer to 10-15 percent. Last year they had a wind turbine proposal made to the Tribe that was going to happen at one of their best lek sites. Edmund said it seems like most of the wind turbine sites they've located on the reservation are associated with lek sites. It was felt that this project and the roads and power lines would really be very destructive, so the Tribe decided to turn that proposal down. In large part that decision was based on sage-grouse studies that USFWS had supported about 6 years previous. One was a general study to identify populations and use, and the other was the West Nile study. It shows that if you have information you have a good basis to make some pretty good assumptions on. The Tribe cares; they still have not instituted hunting on the sage-grouse on the reservation. That was stopped that when they found out that WNV had a negative effect on the birds and haven't reinstituted hunting yet. The Tribe is very concerned about overall habitat quality, not just on the Duck Valley Reservation but on the periphery too. The Tribe's reservation land is 20-25 mile square.

Wyoming Core Area Plan Discussion

In response to the SAC's request to provide some additional information on the planned December 1 meeting in Boise to talk about the Wyoming Core Area Plan, Jon Beals provided a little more information about the discussions to date, the December 1 meeting and future plans and offered to answer any questions that he could.

He noted that the Wyoming folks are motivated by different threats than in Idaho, namely energy development and especially natural gas development. Wyoming spent 3-5 years looking at areas where they wanted to preserve habitat. The Idaho focus will be more on fire, etc. One thing that OSC liked about the Wyoming approach was that there were some activities that were grandfathered in, like grazing. The whole purpose of the meeting on December 1 is just to have an exploratory discussion with interested stakeholders.

Discussion and questions:

- Is the core area strategy what Wyoming considers their state conservation plan?
 - Paul Makela responded that Wyoming has a plan but in the core area exercise they went through they delineated those areas that were related to gas and oil development and those areas were excluded. The state has siting authority for oil and gas. In Idaho it's vested in the County. In Wyoming the Governor issued an Executive Order that said what they will and won't do in core areas.
- What is Idaho proposing to do at the Thursday meeting?
 - Jon said that on Thursday the guy who chaired the Wyoming effort is coming to discuss and explain their process. Hopefully there will be other folks there to talk about some of the things that popped up along the way. Think everyone is in agreement that not doing anything is not an option.

- Rochelle said at the Cattlemen’s convention they handed out a letter saying that if they’re successful at this there’s a chance that it would preclude a listing in Wyoming.
 - Kathleen said that in Wyoming core areas are set aside as mitigation.
- Alison asked if any effort was made to set up a web link to allow participation for those who couldn’t make it to Boise.
 - Jon said he would look into it. [He did and they set up an Internet connection so that people could watch the presentation and discussion live.]
- Rochelle asked how would this relate to the existing Idaho state plan?
 - Jon said that that is a point of discussion.
- Ann commented that in Wyoming the whole siting authority issue could apply to any type of land ownership. In Idaho that couldn’t happen. In Idaho we could only deal with what happens on state land.
 - Jon said that’s an issue that’s been tumbling around in people’s minds. We just don’t know right now.
- Dave Ellis said we need to have a mechanism in place to get it onto the lands where the birds exist. If BLM doesn’t have something in place it won’t work. It’s got to go to where the birds actually are.
 - Don Kemner said that’s one of the questions the BLM planning process is starting to try to address.

Update from Office of Species Conservation on the Status of Sage-grouse Funds

Jon Beals said he started working on overseeing the OSC sage-grouse grant about a year ago. He is committed to providing more regular funding updates to the SAC. Since 2001, OSC has received \$3,111,921 from Congress in appropriations for sage-grouse. Jon explained that OSC received the last \$1 million grant in 2010 but that earmarks are no longer an option and OSC is trying to figure out ways to secure some future funding for sage-grouse conservation.

Jon handed out the following summaries of the Sage-grouse Conservation funding breakout (these have been modified for the notes and numbers rounded):

Item	Dollar Amount	Total Percentage
IDFG Conservation (grant funds)	\$2,285,232	~86%
Sage-grouse Initiative	\$20,000	~1%
LWG facilitation	\$51,260	~2%
Conservation strategy	\$82,399	~3%
Illustrated sage-grouse guide	\$16,843	~1%
Mitigation	\$1,895	—
CCAA Feasibility	\$33,602	~1%
CCAA Development	\$67,068	~2%
Habitat studies	\$75,998	~3%
OSC coordination	\$15,573	~1%

Grant Number	Grant Amount	IDFG Conservation	Cooperative Sage Grouse Initiative	Sage Grouse Facilitation Coordination	Sage Grouse Conservation Strategy	Illustrated Sage Grouse Guide	Mitigation CDC	CCAA Feasibility	CCAA Development	U of I Habitat Studies	OSC Sage Grouse Coordination	Total	Grant Balance
SAGEGR_03	\$698,000	\$698,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$698,000	\$0
SAGEGR_04	\$296,303	\$296,303	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$296,303	\$0
SAGEGR_05	\$295,832	\$264,971	\$17,580	\$10,860	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$293,412	\$0
SAGEGR_06	\$295,586	\$196,079	\$2,419	\$31,143	\$65,943	\$0	\$0	\$0	\$0	\$0	\$0	\$295,586	\$0
SAGEGR_08	\$246,100	\$212,350	\$0	\$0	\$16,456	\$1,864	\$1,895	\$13,533	\$0	\$0	\$0	\$246,100	\$0
SAGEGR_09	\$250,000	\$186,920	\$0	\$0	\$0	\$9,351	\$0	\$20,067	\$33,097	\$0	\$0	\$249,436	\$0
SAGEGR_11	\$1,000,000	\$430,607	\$0	\$0	\$0	\$5,627	\$0	\$0	\$33,971	\$75,997	\$15,572	\$561,776	\$438,223
BLMSG1_10	\$30,000	\$0	\$0	\$9,257	\$0	\$0	\$0	\$0	\$10,000	\$0	\$0	\$19,257	\$10,742
TOTAL	\$3,111,821	\$2,285,232	\$20,000	\$51,260	\$82,399	\$16,842	\$1,895	\$33,601	\$67,068	\$75,997	\$15,572	\$2,649,871	\$448,965

Don Kemner showed the following summary of the IDFG funding status. He explained that some of Jon's numbers and Don's numbers are out of date since they talked this morning. Don explained that there is approximately \$220,000 in past RFP commitments, those are project that have been approved, received their funding, or it's sitting in the account waiting to be paid out. They are ongoing projects or they will occur in the near-term. There is another \$1,000 or so in LWG expenses coming in and this SAC meeting will cost approximately \$4,000.

What this total doesn't include is that right now with facilitators under contractor for LWG meetings there's \$28K in upcoming contracted meetings that is not accounted for, plus another SAC meeting before the end of June. Those expenses could come out of \$74,000 that Jon referred to, or it would come from other LWG funding.

Additional Spent OSC Funds—as of November 2011	
10% overhead	(\$31,939)
RFP funding commitments	(\$220,589)
Current expenses	(\$1,100)
Estimate for November SAC meeting expenses	(\$4,000)
Future Expenses (anticipated)	
Remaining expenses on FY12 (July 2011-June 2012)	(\$28,278)
LWG facilitator contracts	
Estimate for next SAC meeting (high estimate)	(\$4,000)
Total	(\$289,906)

Source	Amount	Timeframe
Local Working Group funding		
U.S. Fish & Wildlife Service	\$20,000	Sept 2011-Dec 2012
BLM	\$10,000	Grant application submitted
OSC		Nov 2011 – Sept 2015
IDFG (match to BLM grant)	\$5,000	July 2011-June 2012
SAC Funding—as recommended at June 2011 meeting		
IDFG	\$5,000	July 2011-June 2012
BLM (for facilitation)	\$10,000	January-December 2012
Sources of Matching Funds		
Private participation	N/A	On-going LWG and SAC meetings

Don explained that with the additional adjustments to the funding and anticipated additional funding sources, there is about \$74,000 left that could be spent for LWG facilitation, or on the ground projects, or held in reserve. Initially he asked SAC members to think about what to do with those funds. After discussion the SAC agreed to defer this discussion until the results of the grant applications are known and until IDFG and OSC can pull together a "final" fiscal accounting.

SAC agreement:

- After discussion participants agreed to defer making any decision until IDFG learns the results of the grant applications and has a chance to work with OSC to provide an updated fiscal reports.

Update on USFWS Sage-grouse Review and Listing Decision

Kathleen Rapley provided an update on the 2010 listing decision and upcoming decision framework. She explained that USFWS made the decision based on the 5-factors analysis. The warranted decision was based on factors A and D only.

She provided the following summary of the 2010 listing decision:

- Factor A summary (present and threatened destruction, modification of habitat or range is a significant threat):
 - Fragmentation is the key cause of the decline of sage-grouse populations.
 - Suitable habitat that is fragmented is of little use to sage-grouse.
 - Habitat conversion (fragmentation) due to agriculture, urbanization, roads, fences, power lines, fire, invasive plants, woodland encroachment, grazing, energy development, and climate change all contribute to present and threatened destruction of habitat.
 - These threats vary in intensity throughout the range: in the western part of the range fire and invasive plants are the biggest threats.
 - Degree of impact due to livestock grazing depends on the management practices and local conditions.
 - Rate of sagebrush removal exceeds rate of restoration. Sagebrush is low to recover (up to 100 years). Burns easily and is replaced by annuals in much of the range of grouse.
 - Two strongholds remain where habitat can support sage-grouse (southwest Wyoming and the Great Basin-OR, ID, NV).
 - In the remainder of the range, if threats are not ameliorated, the remaining habitat cannot support sage-grouse populations.
 - With continued habitat destruction resulting in fragmentation, sage-grouse populations will decline, become more isolated and more vulnerable, increasing the risk of extinctions.
- Factor B summary (over utilization is not a significant threat):
 - Harvest does not appear to threaten the species overall.
 - There have been negative impacts on local populations.
 - Sage-grouse hunting is regulated by state wildlife agencies.
 - It is evaluated and adjusted on an annual basis.
 - States have ability to implement emergency closures of hunting (WNV outbreaks).
 - Sustainable harvests depend on quality of habitat and health of populations.
- Factor C summary (disease and predation are not significant threats):
 - Sage-grouse are host to a wide variety of diseases and parasites.
 - WNV is the only disease concern with nearly 100% mortality.
 - Continued water development that provides suitable conditions for mosquitoes will likely increase the prevalence of WNV.
 - Increase in temperatures from climate change may exacerbate the effects of WNV.
 - Where habitat is not limited and is of good quality, predation is not a significant threat.
 - Continued fragmentation (see factor A) will increase effects of predation.
 - Predator removal efforts have not resulted in increased populations in the long term.
 - Raven predation is increasing in some areas due to human activities, but not range wide.

- Factor D summary (inadequacy of regulatory mechanisms is a significant threat):
 - o These include: local land use laws and state and Federal laws.
 - o Regulatory mechanisms on Federal lands have not been effective at addressing threats.
 - o Adequate regulatory mechanisms include implementation and enforcement.
 - o BLM manages 51% of sagebrush habitat within sage-grouse management zones.
 - o FS manages 8% of sagebrush habitat within sage-grouse management zones
 - o Species managed as sensitive species per BLM Manual 6840. Manual requires that RMPs implement actions that will bring species and habitats to a condition where sensitive species policies are no longer needed.
 - o Paul will discuss new BLM policies and RMP revisions.
 - o Sage-grouse designated as a sensitive species on FS lands. However, protection varies based on stipulations within LRMPs, which guide the FS in its activities. Of 33 forests that manage for sage-grouse, 16 do not address sage-grouse management in their LRMPs.
- Factor E summary (other natural or manmade factors affecting the species are not significant threats):
 - o Examples include: pesticides, contaminants, recreational activities, and drought.
 - o Drought is limiting factor only where habitat is degraded.
 - o These factors will continue but are not resulting in local or range wide declines.

Kathleen explained that the USFWS is under multidistrict litigation with Wild Earth Guardians to either list them or take them off the candidate list by 2015. The listing decision for sage-grouse is due in 2015 as part of the multidistrict litigation. USFWS' Region 6, out of Denver, is the lead for the decision. Idaho USFWS and others across the range will assist in decision. USFWS representatives are involved in the Western/Eastern RMP teams. New data will be collected through the annual Candidate Notice of Review. In 2011 there was no change in status. The threats that were originally identified still remain. The analysis process for the listing decision will begin some time in 2012.

Needs for 2015 decision include but are not limited to:

1. Updated/corrected data on fire, restored habitats (used by grouse).
2. Conservation efforts developed/implemented: PFW-Programs, CCAAs, CCAs, SGI (most importantly, how much habitat [sagebrush] has been planted/enhanced). How have these efforts benefited the species, changed trends?
3. What regulatory mechanisms have been developed/implemented?
4. New tools such as the BLMs mapping of high priority habitats and subsequent IM that will provide regulatory mechanisms to direct actions within specific habitats.
5. Coordination from states and others in determining how much habitat is enough? This should correlate to number of birds.
6. How have threats identified in the finding been minimized or removed? (Fuel breaks, restoration, conservation or annuals to natives/perennials...).
7. What is the overall trend in local, regional populations? Why? The goal is to improve the trend of the species by removing/reducing threats (as outlined in the previous warranted decision).

Sage-grouse Priority Area Analysis

Paul Makela (BLM) gave the following presentation on the sage-grouse priority area analysis:

Sage-grouse Priority and General Areas: Idaho

November 2011
Paul Makela and Don Major
Idaho BLM State Office



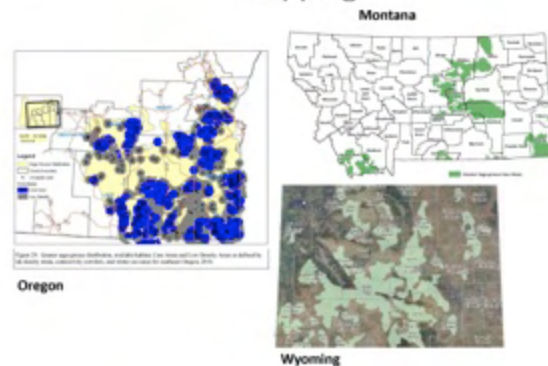
Goal

- *Create a transparent and repeatable, science/biology based analysis framework :*
 - To aid in policy development, provide context for RMP updates, project NEPA etc.
 - That we can readily update with new data (e.g. lek and habitat information; other inputs, human development, climate change etc.
 - Help preclude need to list sage-grouse per ESA

Background

- BLM national 2010 policy set the stage
 - *“habitat of highest conservation value relative to maintaining sustainable sage-grouse populations range-wide.” [Recent terminology: “Preliminary Priority Habitat Areas”]*
- Other states have completed core/priority area mapping (e.g. WY, MT, OR)...

Examples: Other States...Core Habitat Mapping

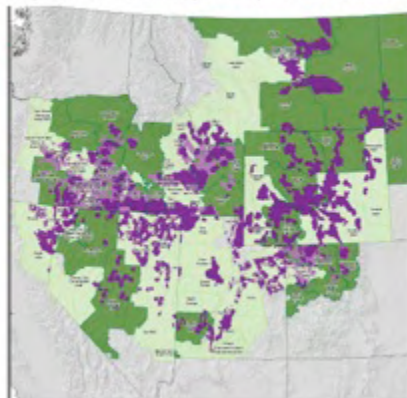


Rangewide Composite of Preliminary Priority Habitat to Date

NV and UT PPH still in progress. Areas shown are based on other habitat data for interim.

Preliminary General Habitat completed for ID, CO, OR.

Reasonable representation.



Background

- Idaho BLM completed draft analysis/report- July 2011.
- Submitted to state wildlife agencies, FWS, USGS, UT/CO BLM for technical review
- Completed revised version in September 2011
 - Incorporated comments and suggestions received.

Analysis Area

Completed in context of WAFWA Sage-grouse Management Zone IV
Idaho shares important habitats with OR, NV, UT, MT

Info for adjacent states in MZ IV helps inform model, provides regional context.



MZ II information in the Bear Lake Plateau modeled separately, due to limited data.

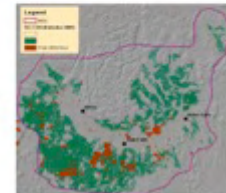
Datasets Used



2010 Lek datasets:
IDFG, ODFW
NDOW, MFWP, UDWR

Currently Occupied Habitat

- BLM NOC 2009
- Seamless rangewide GIS habitat map
- Informed with local /state level biologist input
- ~Good fit with Idaho Key habitat map
- Informed with recent fire information



MZ IV Priority Areas: Methods

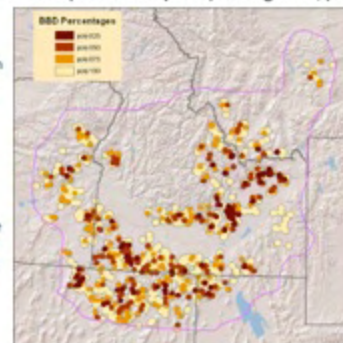
Two Model Components: *Breeding Bird Density (BBD)* and *Lek connectivity*.

- For BBD we used a modified Doherty et al. (2011) approach to delineate high density breeding areas defined by maximum male lek attendance
 - Compared original Doherty et al. method with a modified version
 - Modified Doherty used the Idaho occupied lek rule set (i.e. last 5 years, 2+ males); Original Doherty used past 10 years; 1 bird ruleset.
 - Modified method selected because...
 - More consistency with terminology and definitions in the IDFG lek database, and desire to focus on more recent population information
 - Captures less non-habitat
 - Used 75% Breeding Bird Density (BBD) surface (e.g. top 75% of leks).

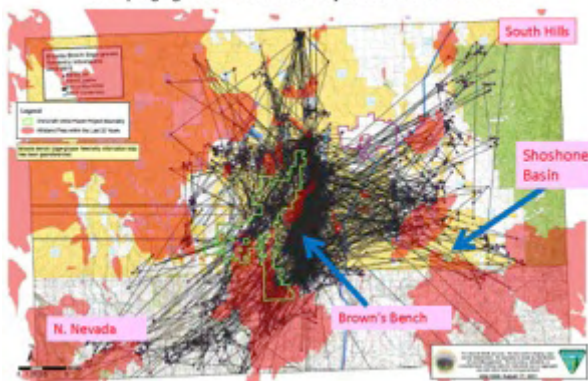
BBD Results

Orange + red + dark red areas capture 75% BBD. A 4 mile buffer applied to leks captures most (~79%) nesting areas, per literature.

Focusing only on the "best" BBD (dark red spots) would not account for important landscape and population connectivity concerns...There fore we needed to incorporate a connectivity model.



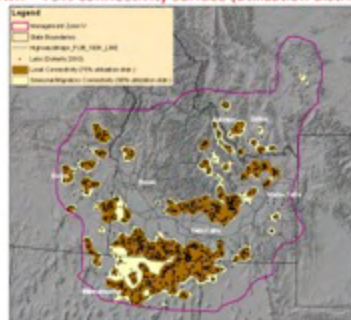
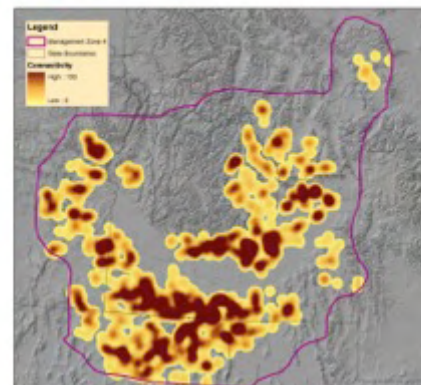
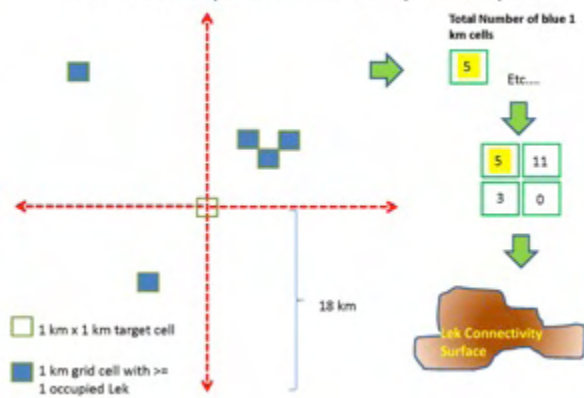
Example: 8 Yrs Sage-grouse Telemetry: Note the landscape nature of habitat use by sage-grouse: We should not just focus on the BBD dots



MZ IV Priority Areas: Methods

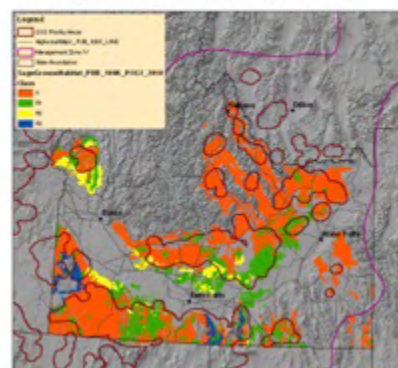
2) Lek Connectivity: modified Hagen (2011)

- Kernel density analysis; 1 km grid cells
- 18 km search radius for 1 km cells with lek presence
 - "Leks separated by >13-18 km could be isolated due to decreased probability of dispersals from neighboring leks" (Knick and Hanser 2011)
- Created a utilization distribution in GIS, showing general areas of lek "connectivity" based on the top 75% of "leks" (as function of 1 km cell distribution...)



Results are spatially consistent with FWS reference to the NV/ID/OR stronghold

Property Address		2016 Attributes						2017-2018 Attributes	
Name	Address	Total Value	Total Exemptions	Percent Exemption	Prop. Percent	Prop. Percent	Average Market Value	Median Market Value	2017-2018 % of Property Tax
A	4140131	643	0	0%	0%	0%	23796	23120	90.000000
L	4140132	648	0	0%	0%	0%	23796	23120	90.000000
S	4140133	650	0	0%	0%	0%	23796	23120	90.000000
J	4140134	651	0	0%	0%	0%	23796	23120	90.000000
S	4140135	652	0	0%	0%	0%	23796	23120	90.000000
S	4140136	653	0	0%	0%	0%	23796	23120	90.000000
S	4140137	654	0	0%	0%	0%	23796	23120	90.000000
S	4140138	655	0	0%	0%	0%	23796	23120	90.000000
S	4140139	656	0	0%	0%	0%	23796	23120	90.000000
S	4140140	657	0	0%	0%	0%	23796	23120	90.000000
S	4140141	658	0	0%	0%	0%	23796	23120	90.000000
S	4140142	659	0	0%	0%	0%	23796	23120	90.000000
S	4140143	660	0	0%	0%	0%	23796	23120	90.000000
S	4140144	661	0	0%	0%	0%	23796	23120	90.000000
S	4140145	662	0	0%	0%	0%	23796	23120	90.000000
S	4140146	663	0	0%	0%	0%	23796	23120	90.000000
S	4140147	664	0	0%	0%	0%	23796	23120	90.000000
S	4140148	665	0	0%	0%	0%	23796	23120	90.000000
S	4140149	666	0	0%	0%	0%	23796	23120	90.000000
S	4140150	667	0	0%	0%	0%	23796	23120	90.000000
S	4140151	668	0	0%	0%	0%	23796	23120	90.000000
S	4140152	669	0	0%	0%	0%	23796	23120	90.000000
S	4140153	670	0	0%	0%	0%	23796	23120	90.000000
S	4140154	671	0	0%	0%	0%	23796	23120	90.000000
S	4140155	672	0	0%	0%	0%	23796	23120	90.000000
S	4140156	673	0	0%	0%	0%	23796	23120	90.000000
S	4140157	674	0	0%	0%	0%	23796	23120	90.000000
S	4140158	675	0	0%	0%	0%	23796	23120	90.000000
S	4140159	676	0	0%	0%	0%	23796	23120	90.000000
S	4140160	677	0	0%	0%	0%	23796	23120	90.000000
S	4140161	678	0	0%	0%	0%	23796	23120	90.000000
S	4140162	679	0	0%	0%	0%	23796	23120	90.000000
S	4140163	680	0	0%	0%	0%	23796	23120	90.000000
S	4140164	681	0	0%	0%	0%	23796	23120	90.000000
S	4140165	682	0	0%	0%	0%	23796	23120	90.000000
S	4140166	683	0	0%	0%	0%	23796	23120	90.000000
S	4140167	684	0	0%	0%	0%	23796	23120	90.000000
S	4140168	685	0	0%	0%	0%	23796	23120	90.000000
S	4140169	686	0	0%	0%	0%	23796	23120	90.000000
S	4140170	687							

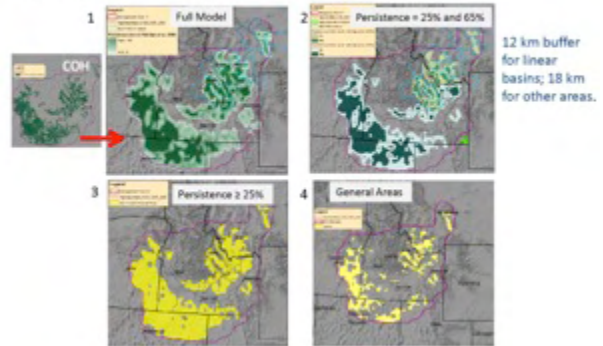


MZ IV General Areas (GAs)

- Areas of sage-grouse habitat occurring outside of the Priority Areas
 - Fills in the gaps between PAs
 - Encompass non-breeding seasonal habitats (not included in BBD / Lek Connectivity components)
 - May not be leks present or leks may be too small to make the cut for the 75% BBD model. Yet provide habitat.
 - May provide population connectivity between PAs; remnant/refugia from fires etc.
 - Some GAs may reflect lack of data/survey effort (e.g. NV/OR/ID intersection).

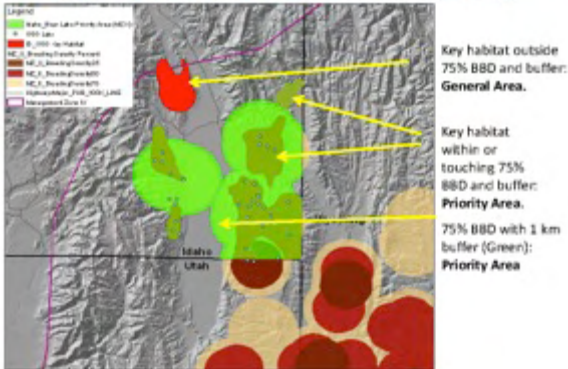
MZ IV General Areas: Methods

Incorporated a **population persistence model** (Aldridge et al. 2008) based on habitat continuity



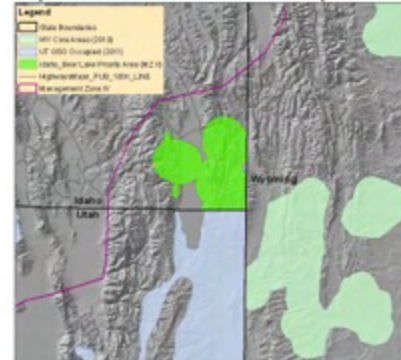
Bear Lake Plateau Priority Area & General Area

Not part of MZ IV model. Extreme SE Idaho. Available information is limited.



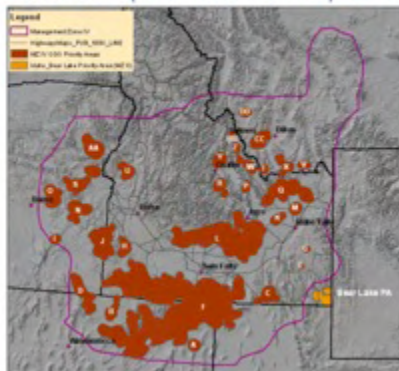
Idaho Bear Lake Priority Area:

Comparison with WY Core and UT Occupied Habitat



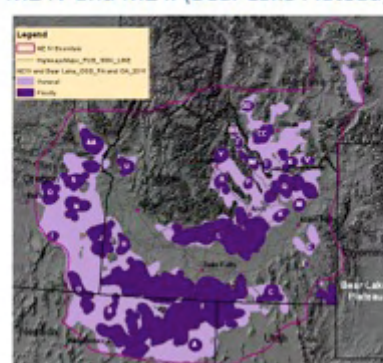
Priority Areas:

MZ IV and MZ II (Bear Lake Plateau) Combined

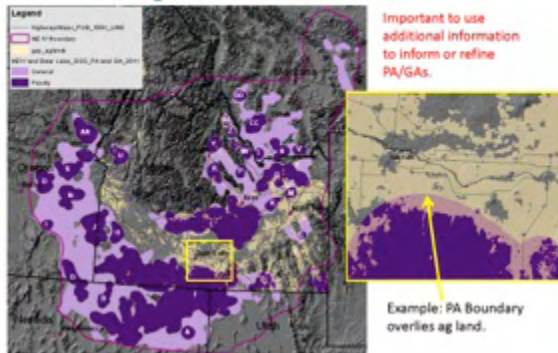


Combined Priority Areas and General Areas

MZ IV and MZ II (Bear Lake Plateau)



Combined Priority Areas and General Areas Agricultural Lands Identified



Further Informing MZ IV PAs

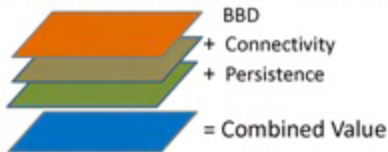
- Added Aldridge et al. (2008) sage-grouse population persistence model to BBD and Connectivity models.



- > 65% value (dark green) = high sage-grouse persistence likelihood long term (contiguous habitat)
- 25-65% value (light green) = low sage-grouse persistence likelihood long term (more fragmented habitat)

Further Informing MZ IV PAs

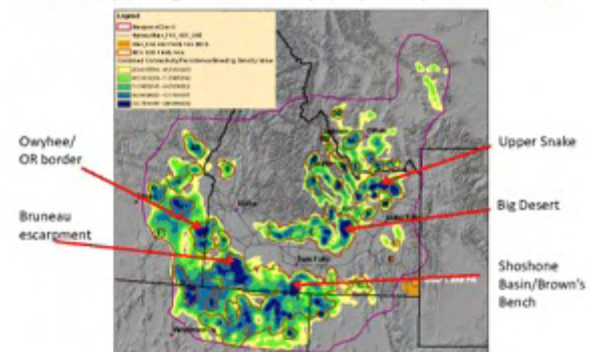
- Examine Combined Value (Normalized data = values 1-100)



- Model output shows gradient of relative "importance" based on high BBD, connectivity and/or persistence values...

Result: Composite BBD, Connectivity and Population Persistence Map MZ IV WITHIN PAs and GAs

Blue areas represent higher Combined Value (i.e., "importance") relative to other areas.

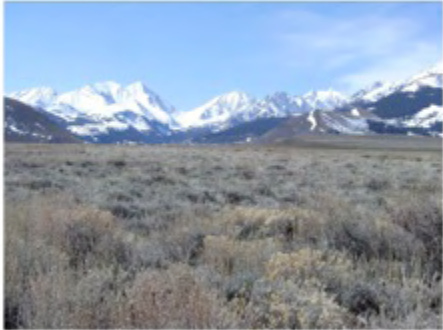


Possible Approaches within Specific PA Polygons- Helpful for RMP, project NEPA

- Habitat Maintenance Focus: Blue areas** (and Bear Lake plateau). High priority to protect from new infrastructure development (wind farms, transmission, etc.), fire etc.
 - Aggressive wildfire suppression, conifer control, maintain rangeland health via permit renewal/S&G.
 - Consider development exclusion zones, ACEC, or other approaches.
- Habitat Improvement Focus: Green/ yellow areas.** Includes fragmented, burned areas.
 - Improve habitat connectivity
 - Restoration seedings/plantings,
 - Fire protection etc.

Policy Considerations and Questions

- Conservation in the Priority Areas is crucial in the MZ IV and Idaho context. **The top 5 PAs (F,L,Q,D,I):**
 - capture about 80% of sage-grouse "population" across all PAs
 - 75% of the sage-grouse population in MZ IV.
 - 71% of Currently Occupied Habitat in MZ IV
- All 30 PAs collectively capture about 94 % of MZ IV sage-grouse population (based on males at leks).
- Idaho PAs harbor about 62% of the MZ IV population
 - OR ~ 8 %
 - NV ~ 23 %
 - UT ~ 4%
 - MT ~3%

Applications of PAs/GAs • Field Offices should begin using the maps and data, per Idaho BLM Information Bulletin 2012-001. – Provides context for conservation planning. – Maps not construed as policy themselves – Complement BLM national Interim Policy – Provide context for pending BLM regional RMP amendment effort – Ability to update with new data	Questions? 
--	---

Paul pointed out that the slide with the “spaghetti map” is to point out that we need to manage sage-grouse on a landscape scale. The map shows point-to-point telemetry movements over a number of years. Paul noted that this (preliminary priority habitat etc.) is the first step in a complex strategy that requires state agency involvement and the collaboration of many individuals and agencies.

Paul pointed out that we need to think about habitat focus and high priority areas to protect from new infrastructure development, etc. We also need to focus on habitat improvement in appropriate areas. Idaho is a major player in sage-grouse management Zone 4. These maps will be used for interim planning and NEPA and will provide the spatial foundation for the BLM Interim Policy. They will be refined/revised as we move forward with the BLM planning strategy.

Discussion and questions:

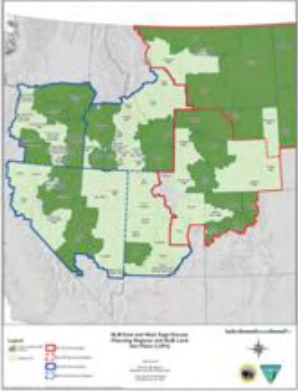
- So is the primary focus of this effort on breeding? It doesn’t appear to deal with other life states.
- Yes, the preliminary priority habitat portion of the map is driven by breeding density and a lek connectivity model, but the associated analysis buffers (4 miles for breeding density, 11 miles for lek connectivity) capture the other seasonal habitats in many areas. The persistence model (essentially an indicator of sagebrush extent) used for the preliminary general habitat map captures much of the rest of the seasonal habitats. The maps will be refined further using additional data as we move ahead over the next several months. How similar are the priority areas you’ve identified to the core areas that Wyoming has identified? Is that where this is going?
- Will this map be adopted as part of the Interim Policy?
 - The Interim Policy that’s coming out has some specific recommendations and stipulations for priority and general areas. This map is the spatial component for that policy, with respect to Idaho. This is a work in progress but I’ve been told that we need to have it as complete as possible by January scoping.
- The Shoshone Paiute Tribe has information that may be helpful to this effort.
 - Ann has information through 2010. Now that Edmund is involved in the SAC we’ve got an interface again to make sure we’re incorporating the most recent available information.

- Is there an overlay looking at how wind energy and power lines related to the priority areas?
 - o We've looked at some of that. A transmission line that comes through one of those priority areas, but parallels a highway may be preferable to an alternative that passes through otherwise in-tact habitat. But we need to consider other local information as well.

BLM Sage-grouse Planning and Policy Update

Paul Makela (BLM) provided the following update on BLM's sage-grouse planning and policy activities:

BLM Planning Update Paul Makela Idaho BLM State Office 	Background • 2010 Federal Register Notice- Listing Decision: – Warranted but Precluded – Inadequacy of regulatory mechanisms a major threat – Per FWS, principle BLM's regulatory mechanism is Resource Management Plans (RMPs) • BLM decided to incorporate explicit objectives and conservation measures into RMPs within the next 3 years (~ May 2014) – Gunnison SG, bi-state CA/NV, and WA DPS not included at this time
BLM's Role • BLM Planning Strategy Objective: <i>"develop new or revised regulatory mechanisms, through RMPs, to conserve and restore the greater sage-grouse and its habitat on BLM administered lands on a range-wide basis over the long term"</i> – Sage-grouse habitat in 73 BLM planning units rangewide (Land Use Plan Areas)	Big Job...Need to Stratify the Effort • National Policy Team- provide overall policy guidance; consistent planning objectives • National Technical Team-Use best science to derive recommended conservation measures for use in the plan amendments • East and West (of the range) Regional Management Teams: to provide overall leadership (State Directors, FWS Regional Deputy Directors, State wildlife agency directors...); coordinate planning within Region – East/West- Different key issues (oil/gas vs. fire, etc.)

 Planning Regions East (Red): MT (most of) WY CO NE UT ND SD West (Blue): ID SW MT W UT OR NV CA	Teams... • Regional Project Managers-Lead East / West Regional interdisciplinary teams • Regional Interdisciplinary Teams- Coordinate EISs/ RMP amendments. Members from subregions. • Subregional (~ state level) Interdisciplinary Teams – Conduct environmental analyses for EIS – State, federal agency specialists – Provides goals,/objectives, management planning considerations, conservation measures>>>regulatory mechanisms – Assistance from contractors
 BLM Sage-grouse RMP Amendment: West Region	 BLM Sage-grouse RMP Amendment: Idaho/ SW Montana Subregion • One EIS covering all ~16 BLM planning units • Team membership from ID, MT BLM, other agencies
Timeline • Complete "Preliminary Priority/ General Area "maps: 9/ 2011 • Issue final BLM Interim National Policy: 12/ 2011 (for PA/GAs) – (incorporated feedback from state agencies, Governors) • Notice of Intent in Fed. Register (for EIS): ~12/9/2011 • Scoping: 1/2012; Complete by ~2/10/ 2012 – 30 day comment – Public meetings – Categorize comments – Scoping report • Draft EIS/ Draft RMP Amendments published 12/ 31/2012 • Final EIS/ RMP Amendments 11/ 30/2013 • Protest Period ends 12/ 31/2013 • Complete Governor's Consistency Reviews: 1/31/2014 • Issue RODs and RMP Amendments 5/30/2014	SAC/ LWG Involvement • Opportunity for comment during scoping • Opportunity for comment during draft and final EIS reviews • SAC TAT: Some agency members will be on the Subregional RMP planning team

Paul explained that BLM's principal regulatory mechanism is the Resource Management Plans (RMPs). They've got teams in each region with coordination occurring from the bottom up and top down. The sub-regional group is where the "rubber hits the road". There will be a series of scoping meetings in January that will provide an opportunity for interested people to provide initial input.

Questions and discussion:

- How come they didn't incorporate eastern Oregon with Idaho?

- That decision was made at a higher level but likely had something to do with incorporating Idaho and sw Montana into Zone 4.
- Are you doing a single EIS or one for each management plan?
 - It will be one EIS covering sage-grouse for all 16 or RMPs in the subregion.
- How will the Interim Policy and permit renewals be connected? We know some permit renewals are already taking place.
 - As I understand it, all of that (permits) will still march ahead under its own time line.
- Are you using RMPs and Land Use plans as synonyms?
 - Yes, they're the same.
- Does everyone understand that the Interim Management instruction memorandum (IM) is the direction for how BLM is supposed to operate through May 2014, during the time frame when BLM is doing this process, then once the RMPs are completed those will replace the Interim Policy.
 - The BLM interim policy issued in December 2011 will guide management on sage-grouse habitat on BLM lands between now and into 2014 when the RMP amendments are anticipated to be completed. After that, the amended RMPs will guide management.
- These scoping meetings are coming up quick. In these scoping meetings does BLM have a proposed action that will be presented?
 - Scoping is intended to solicit ideas from the public. Alternatives will be developed following scoping, and in coordination with the other subregions.

Following are the dates and locations of the upcoming scoping meetings (this information was updated after the SAC meeting). All meetings will be from 5:30 to 7:30 PM:

- Boise, ID - Red Lion Boise Hotel, 1800 Fairview Avenue, Boise ID (January 9)
- Idaho Falls, ID - Red Lion, 475 River Parkway, Idaho Falls, ID (January 10)
- Salmon, ID - Salmon Valley Business & Innovation Center, 803 Monroe Street, Salmon, Idaho (January 11)
- Dillon, MT - National Guard Armory, 1050 Hwy 41, Dillon, MT (January 12)
- Twin Falls, ID - Canyon Springs Red Lion Inn - 1357 Blue Lakes Blvd Twin Falls, ID (January 25)
- Pocatello, ID - The Clarion (formerly the Holiday Inn) - 1399 Pocatello Bench Road, Pocatello, ID (January 26)

Seasonal Habitat Modeling

Sonya Knetter gave the following presentation on seasonal habitat modeling work:

MODELING SEASONAL HABITAT



Idaho Department of Fish & Game
BLM Idaho State Office
Idaho Sage-grouse Advisory Committee Meeting
November 29, 2011

IDAHO SAGE-GROUSE HABITAT PLANNING MAP

Conservation planning tool, a MODEL to help managers plan and prioritize management and conservation actions



Updated annually
Expert opinion
veg. treatments

IDAHO SAGE-GROUSE HABITAT PLANNING MAP

- ✖ Updates have improved utility and accuracy
- ✖ Broad-scale applications due to lack of resolution
- ✖ Mapping scale and accuracy is inconsistent across the state
- ✖ Local expert participation varies



"NEXT GENERATION"



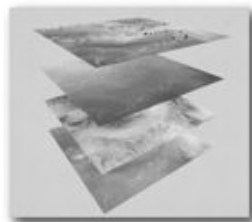
- ✖ Followed Idaho SAC Recommendations (Task 6.5.2.6)
"...explore and review emerging remote-sensing tools and products that would have the capacity and accuracy to refine or replace the Sage-grouse Habitat Planning Map"
- ✖ Modeling approach to seasonal habitat mapping
- ✖ Estimate where seasonal habitat potentially occurs
- ✖ Context for habitat planning, local mapping efforts

METHODS

- ✖ Inductive modeling program MAXENT

Model Inputs:

- Sage-grouse locations
- GIS layers - predictor variables relevant to habitat suitability

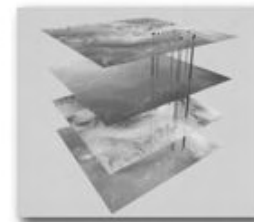


METHODS

- ✖ Inductive modeling program MAXENT

Analysis:

- Statistical function describe environmental conditions underlying locations
- Formed empirically
- Mapped across the study area

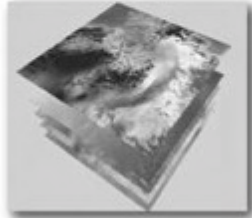


METHODS

- × Inductive modeling program MAXENT

Output:

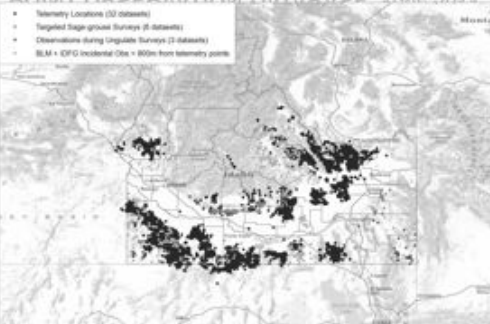
- Model of the distribution of environments predicted to be suitable for occupation



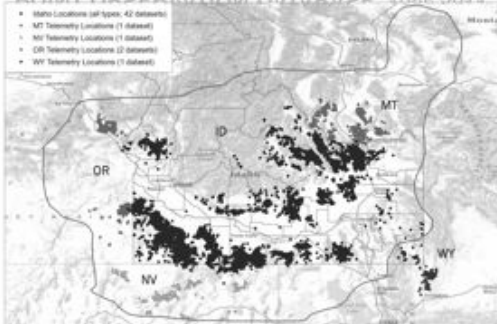
ADVANTAGES OF MODELING APPROACH

- × Objective, transparent and repeatable process
- × Consistent methods across space & time
- × Updated with additional data, fine tuned over time
- × Means of estimating habitat suitability where we lack knowledge of seasonal habitats

POINT OBSERVATION DATABASE 1986-2011



POINT OBSERVATION DATABASE 1986-2011



POINT OBSERVATION DATABASE

- × 31,929 locations (47 datasets)
- × 26,560 High-quality locations for modeling
removed duplicates, imprecise points, points missing dates, and filtered by bird status (only used live locations)

- Breeding - 14,431 (54%)
- Summer - 5,493 (21%)
- Fall - 4,056 (15%)
- Winter - 2,580 (10%)

Periods defined in
2006 Conservation
Plan for the Greater
Sage-grouse in Idaho



METHODS

- × 2 Step Modeling Process

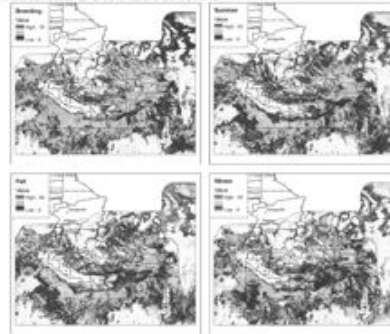


- Bioclimatic Envelope: Climate-based model to define potential sage-grouse habitat, "environmental tolerance"
- Seasonal Models: Bioclimatic envelope, land cover & topography variables to predict likelihood of suitable habitat currently on the landscape

BIOCLIMATIC MODELS

- ✦ PRISM Climate Data, 30-year normals 1971-2000
- ✦ Variables derived from monthly TEMPERATURE and RAINFALL values
- ✦ Annual, seasonal, seasonality variables

BIOCLIMATIC MODELS



SEASONAL MODEL INPUTS

400m grid cells

CATEGORY	VARIABLE
Climate	Bioclimatic model output
Land Cover	% sagebrush in 400m pixel
	% sagebrush in 800m focal window
	ave distance to nearest sagebrush pixel
	% agriculture
Topography	elevation
	slope
	aspect
	terrain roughness index



Data Sources:

Land cover - Northwest & Southwest Regional Gap Analysis Program (ReGAP)
Topography - USGS National Elevation Dataset



FACTORING IN FIRE

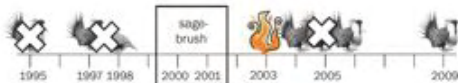
- ✦ Account for habitat changes after timestamp of land cover data (2000/2001)
- ✦ Individual fire effects are difficult to predict
Depends on: timing, intensity, size of fire
type and condition of sagebrush community
weather patterns post-burn
rehabilitation and exotic species establishment
- ✦ Rather than adjust land cover inputs or model predictions in general ways, we used fire to determine which locations were used to inform seasonal models



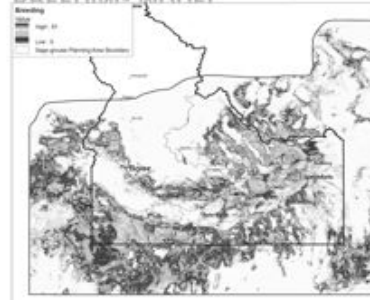
FACTORING IN FIRE

For locations that intersect fire perimeters mapped by BLM and Monitoring Trends in Burn Severity project (1986 - 2010):

- ✦ EXCLUDED if sage-grouse location
 - pre-dates wildfire
 - is < 5 years post-fire (site fidelity)
- ✦ RETAINED if sage-grouse location
 - is ≥ 5 years post-burn



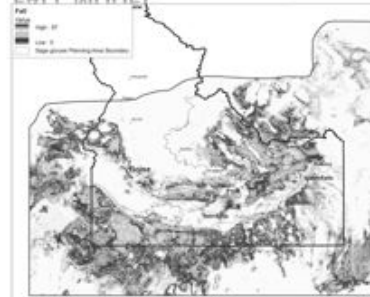
BREEDING MODEL



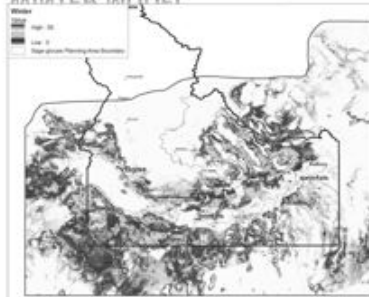
SUMMER MODEL



FALL MODEL



WINTER MODEL



SEASONAL MODELS

× Relative variable contributions

PRECIPITATION	%	SUMMER	%	FALL	%	WINTER	%
precip000	73.8	precip000	73.8	precip000	80.2	precip000	77.7
precip001	20.8	precip001	20.8	precip001	13.3	precip001	20.3
precip	6.8	precip	5.8	precip	5.5	precip001	9.0
precip002	1.2	precip002	1.6	precip002	1.8	precip	4.5
precip003	1.2	precip	1.2	precip	1.2	precip002	0.3
precip004	0.2	precip	1.2	precip	0.2	precip003	0.4
precip005	0.2	precip	0.2	precip	0.2	precip	0.3
precip006	0.2	precip001	0.1	precip	0.2	precip004	0.1

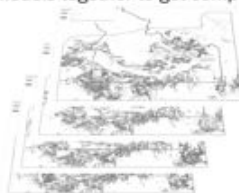
× Evaluated "Goodness of fit" by withholding 25% of locations for testing, significantly better than random predictions

× Evaluate models through comparisons with other models

COMPARISON: HABITAT PLANNING MAP

× No seasonal components

× Added models together to get composite



COMPARISON: HABITAT PLANNING MAP



WHAT MODELS PROVIDE

- ✖ Objective, transparent and repeatable process
- ✖ Easily be re-run and improved with time and additional data
- ✖ Flexible framework for addressing other management questions (e.g., nesting locations, females & broods, different time periods)
- ✖ Provide estimate of distribution where occurrence data are lacking
- ✖ Predictions irrespective of land ownership
- ✖ Testable hypotheses

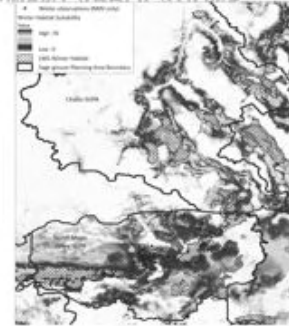
WHAT MODELS DON'T PROVIDE

- ✖ Patterns of occurrence within such landscapes will need to be determined by field observations
- ✖ Quantify habitat quality (key, R1, R2, R3)
- ✖ Habitat quality a function of many factors at multiple scales:
 - Habitat composition and structure at localized "patch scale"
 - Landscape composition and configuration (i.e., fragmentation/connectivity)
 - Disturbance (e.g., fire and invasive species establishment)
 - Food availability
 - Species interactions
- ✖ Will not replace local biologist knowledge

MANAGEMENT APPLICATIONS

- ✖ Provide a context (i.e., base layer) for more local mapping of seasonal habitat

MANAGEMENT APPLICATIONS



MANAGEMENT APPLICATIONS

- ✖ Provide a context (i.e., base layer) for more local mapping of seasonal habitat
- ✖ Prioritize survey efforts
- ✖ Restoration - Identify areas where habitat management can be changed to create habitat characteristics that favor sage-grouse

POTENTIAL MANAGEMENT APPLICATIONS

- ✖ Habitat connectivity / fragmentation by considering potentially suitable versus occupied habitat
- ✖ Facilitate future climate change analyses
- ✖ Used in conjunction with other tools (i.e., models) to help frame conservation planning and prioritization

e.g., BLM Priority Area Analysis

POTENTIAL MANAGEMENT APPLICATIONS

e.g., Overlay breeding density models to highlight areas where directed management actions could have the largest benefit to regional populations

COLLABORATORS

- ✦ **Challenge Cost Share Agreement** - Idaho Dept of Fish & Game
BLM Idaho State Office
- ✦ **Project Leaders** - Leona Swancara (IDFG), Paul Makela (BLM)
- ✦ **Modeling Group** - Sonya Knetter, Leona Swancara, Bill Bosworth (IDFG)
- ✦ **Advisory Group** - project guidance & review

Paul Makela (BLM)	Ann Moser (IDFG)
Don Major (BLM)	Alan Sands (IDFG/TNC)
Tom Rinkes (BLM)	Don Kettner (IDFG)
David Mussil (IDFG)	Tom Hemker (IDFG)
Jack Connelly (IDFG)	

Questions and discussion:

- Has this model been used in other states?
 - No.
- Did you use topography as predicted variable?
 - Yes.
- Can that be used to predict climate?
 - We grouped all of the sagebrush communities together. It doesn't show all the different individual types of sagebrush.
- Is this information out in a report?
 - Not yet. We need to reconvene the group to talk about how we'll disseminate the information.
- This would be really helpful information for the LWGs who haven't done seasonal mapping yet.

Sage-grouse Biology 101

Ann Moser gave the following presentation on sage-grouse biology:

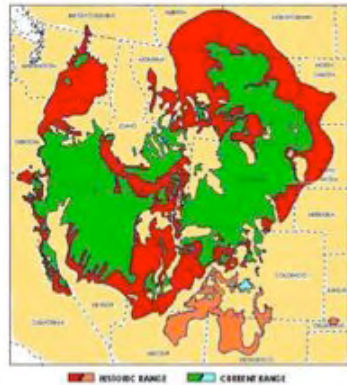
Sage-grouse 101

Ann Moser
Idaho Department of Fish and Game

Classification

- ✦ Sage-grouse are a Gallinaceous bird
- ✦ They are the largest grouse in North America
- ✦ There are 2 species of sage-grouse: Greater and Gunnison

Distribution



Sage-grouse are unique

Compared to other North American game birds:

- Low reproductive rate
 - Average 7-8 eggs
 - Rarely re-nest (~20%)



Sage-grouse



California quail

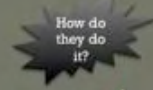
Sage-grouse are unique

- Long-lived
 - 7+ years
- High annual survival rate
 - Higher for females (range 48-78%) than males (58-60%)



Sage-grouse are unique

- High over-winter survival
 - 85-100%



Sage-grouse are a landscape species

Many populations are migratory

- Large movements between seasonal ranges
 - >20 km
- Large annual home ranges
 - >600 km²



Seasonal Habitat Requirements

- Breeding
- Nesting and early brood rearing
- Summer/late brood rearing
- Fall
- Winter

Breeding



As part of the presentation Ann showed a video clip of sage-grouse on a lek. You can view the video at:

<http://www.youtube.com/watch?v=m0M8pZnNlnI>

Nesting



Nest habitat requirements

- Most nests under sagebrush (59-100% range wide)
- Often nest under denser, taller shrubs

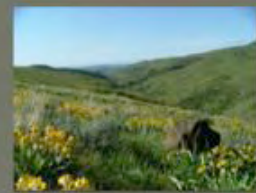


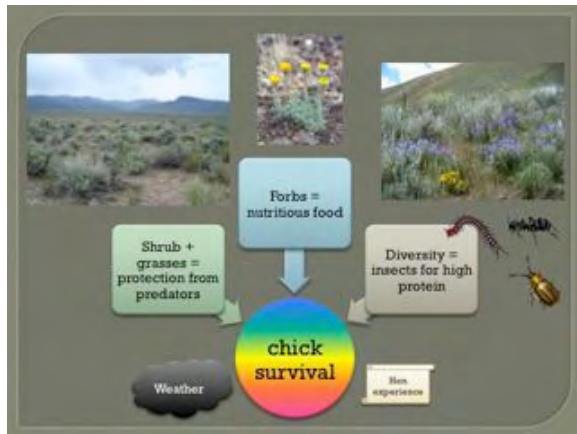
Grass and forb cover also help obscure nest



Early brood rearing

- Chick survival 12-50%, various studies
- Idaho study 25-55% to 3 weeks of age





Late brood rearing

Broods move to areas with green vegetation; sagebrush usually nearby



Late brood rearing

Distances moved vary, depending on juxtaposition of habitats

> In SE Idaho broods moved up to 82 km!



Fall = transition habitat



Winter



Sagebrush available above snow



Ann explained that she wanted to give this presentation in part to remind us why we're all here. She noted that a unique thing about sage-grouse is that they don't have gizzards, so they can't digest hard coated seeds. Sage-grouse are really different from other North American game birds.

They have a high overwinter survival rate, which is unique. Sagebrush is toxic to a lot of animals, but sage-grouse can eat it. Mortality is highest during the breeding period and while they're on the nest. That includes both chick and adult mortality. The highest mortality for males is during lekking. The highest mortality for hens is when they're on the nest because they are not as mobile.

Another unique thing about sage-grouse is that they're a landscape species. You could manage habitat for pheasants in the space of this room. But sage-grouse are migratory; they have to make large movements between seasonal ranges. They do that because they can't get all that they need in one spot so they have to move. Throughout the year the average home range size for sage-grouse is about 600 square km.

Most hens nest within about 4 miles of the lek. But to say "most" is an exaggeration, there are examples of hens going 10 or 20 miles from the leking site. A really important thing for nesting is cover. Most nests are under sagebrush. They could also be under Rabbitbrush or Bitterbrush, or Buckbrush. Often sage-grouse pick the densest, tallest shrubs in the area. They are looking for cover all around with grass and forbs to hide her from predators, cover from ravens and raptors above, and cover from badgers and coyotes coming from the sides. Not only is nest vulnerable, but hen is vulnerable too.

For the first few weeks the hen doesn't move far from where she's nested. There have been lots of studies but it's hard to estimate survival of the chicks. It is only recently where people have put radio transmitters on chicks. The chicks are really little and the transmitters have to be sewn into the chicks. Within 3 weeks up to half the chicks in the brood could be lost. In the first few weeks of life the chicks eat a lot of bugs. Drought is really horrible for sage-grouse because there's nothing to eat, no forbs, no bugs.

During late brood rearing they might move to wet or irrigated areas, or move up in elevation. Basically they're going to go somewhere to get to greener food. There was one study in southwest Idaho where a hen moved her brood up to 82 km. In the fall they just gradually make their way depending on weather and snow conditions to their winter habitat. In the winter they'll often move to a ridge or somewhere where the snow is blown off the sagebrush.

Questions and discussion:

- Can they start eating sagebrush early on, how old are they when they can start eating sagebrush?
 - Don't know. They probably don't eat sagebrush until they have to. Sagebrush takes a lot of energy to digest.
- How old are sage-grouse before they start to fly?
 - They start to fly within a few days. The hen will usually walk the brood to their new location.
- We saw some grouse after the snow came and they were still there quite a bit later. The snow machine folks say the sagebrush is covered over. Another guy who flies has seen them up there. They are probably in a windswept place. Does anyone know how soon they go to winter habitat?
 - Can't give dates, but probably it depends on weather conditions and photoperiod. In Mountain Home all the sudden the sage-grouse were just gone one day before the snow came. They started moving in October.
- There may be transition areas too where they go until mid December but then you don't see them later because there's too much snow. And also the places where they're moving up to windswept ridges are high up. They may also be bouncing back and forth. They can fly big distances without much effort.
- Does the wetness hurt the chicks? Or do they have enough cover that they're okay.

- 2006 was one of the wettest years we've had. Sage-grouse production was phenomenal that year. This year last year we had lots of rain but poor grouse production. It may be that it was too cold.
- Depends how old the chicks are too because when they're really young they can't regulate their body temperature that well. If it is wet the hen may sit on them and brood them to keep them dry but then they don't get to eat.
 - The other thing about late brood rearing habitat; the hens are taking their chicks to the wet areas where the mosquitoes live. They are vulnerable because of their biology and because of their behavior.
- Does anyone know if there's research done on what produces good insect life? I wouldn't think a rested site would be as good for production as an unrested site. I see insects in manure.
 - I think there are some studies on that – moderately grazed may have better production. Not sure.

Wrap Up and Adjourn

In closing for the day, Don Kemner said that he challenged everyone to think about what they learned today and what each of them is going to bring back to share with their LWGs.

WEDNESDAY NOVEMBER 30, 2011

SAC Subcommittee Updates

Funding Subcommittee

Don reported that the funding subcommittee reviewed the spreadsheet of funding opportunities that is sent out to LWGs approximately annually. The spreadsheet includes funding sources such as BLM, IDFG, Grouse Partnership, etc. They had NRCS, BLM, and USFS look at the spreadsheet back in late September and updated it with new information as best they could given that Federal agencies are on continuing resolution. The subcommittee talked about whether it is appropriate to send it out to the LWGs or not. For now they decided to hold onto it until the Federal agencies have better idea of what their budgets are. Also the Intermountain West Joint Venture hasn't announced their RFP yet. These different sources are waiting on Federal funding decisions too.

Yesterday the SAC discussed the OSC budget and development of a recommendation for what to do with the approximately \$74,000 that may be available. Don recommended that the SAC wait on making any recommendations until we know when we have the two grants to fund the LWG facilitation.

The subcommittee also decided that the funding subcommittee task identified in the state plan i.e., development a 5-year funding plan, needed to be delayed given the current uncertainty regarding Federal funding sources.

Conservation and Mitigation Subcommittee

At the last SAC meeting participants requested an update on the status of the mitigation framework as part of this meeting.

For the people who haven't attended previous SAC meetings, Don provided a quick summary of the mitigation framework. He explained that after a project proposal (e.g., wind farm or something along those lines) has gone through whatever regulatory review that's required e.g., NEPA, or County review, and after avoiding sage-grouse habitat and/or implementing best management practices or doing onsite type restoration; after all that, if the authority that's approving the project says there still needs to be some mitigation done, the mitigation framework would provide an instrument that would allow the entity to pay into a bank. Then a mitigation team would turn around and use that money to pay for restoration to be done to mitigate for whatever habitat may have been lost due to the project.

Don reported that the mitigation subcommittee has been working on the framework for a while and gave a presentation to the SAC last October in Salmon. Since that time the committee gave presentations to state and federal agencies in January, including IDFG, BLM, and the Forest Service in one meeting, and a separate meeting with IDFG, OSC, the Office of Energy Resources and the Governor's Office. Everyone said they liked the framework that had been developed to date and encouraged the subcommittee to keep fleshing it out. They also gave a presentation to the Association of Counties at their meeting in February. That was fairly well received with lots of questions. Later Brett Dumas gave a presentation on it to Rocky Mountain Power.

After those meetings the committee went back and worked on more tweaks to the framework. In the spring there were a lot of questions from both state and Federal legal representative, including concerns from the Federal side on how the framework might be used. The subcommittee took this additional feedback into account and made some adjustments to the framework. For the most part the framework is still what you saw last October.

In late summer the committee sent a letter to the state by way of IDFG and OSC saying here's the framework as we have it, we need to know if the state of Idaho feels like it would take this instrument on and be the implementer of the instrument, and if the committee should continue to flesh out more details of the mitigation handbook. The state has been slow in responding and the latest response was a letter from the state saying we don't have a decision and we need more time to think about this. It seems like the state is unsure if they want to take on being the implementer of mitigation framework. Our assistant director Sharon Keiffer has asked for a firmer answer out of the state. One thing the state probably does want to see the committee do is to continue work on is fleshing out how you determine mitigation units. How do you determine what the necessary mitigation would be and turn that into dollars. Everyone on committee is awaiting the reply from the state.

Questions and discussion:

- Paul said that one of the challenges is that the assumption the committee worked under was that if proponent came in with compensatory mitigation that money would come into central pot and a technical committee would make a determination as to where that money would be best spent. A challenge we will have is that with some of the energy projects it is hard to do a NEPA analysis and determine residual impacts if you don't know what the specific mitigation projects are going to be. If you just know that the proponent is going to give you \$10 million and do good things, it is difficult to measure or predict the outcome. A concern from the legal side therefore is how do we make this mitigation strategy work and still be in line with NEPA. There may be more latitude in an EIS to be somewhat generic with mitigation plans as opposed to an Environmental Assessment. With recent case law it is pushing everyone to be more specific in the EIS as to where and when the mitigation will take place.
- Have there been substantive changes to the framework since the SAC last saw it?
 - No big changes. Just some minor adjustments.

- The question of how you determine mitigation units has merit. There isn't a consistent mechanism to determine what appropriate mitigation is. If we had a process that we agreed on that would save a lot of pain.
- If the state chooses not to be the implementer who would?
 - There are private entities in other states that are doing it. California Department of Fish and Game and BLM have an agreement with National Fish and Wildlife Federation to do it in California.
- Have they looked at it from a crediting basis? That's done in North Carolina and that approach might meet the NEPA requirements for BLM.
 - We had some discussion along that line. One of the hang-ups is having funding to go out and implement projects ahead of time. And no one has money ahead of time.

SAC-TAT Subcommittee

Ann reported that the SAC-TAT met the last two mornings. They have been going through the SAC-TAT Chapter 6 tasks that were assigned. Some of them had been started in the past and needed to be finished up.

One thing they've done is draft a new conservation measure to address recreational events like OHV races, mountain bike races, etc. that might occur in sage-grouse habitat. She explained that the SAC-TAT is seeking approval of the language from the full SAC then will send a letter to the affected agencies with a recommendation from the SAC that they implement the conservation measure and a request for confirmation that they received the letter and the conservation measure text.

The SAC reviewed the draft conservation measure language and after some discussion agreed to the following slightly modified language:

- [Enter final language that Ann recorded]

Ann briefed the SAC on the changes to the LWG annual report that the SAC-TAT agreed to. The revised annual report will be requesting updates on changes to threats in your area and asking the LWGs to report back in qualitative rather than quantitative terms.

She explained that the SAC-TAT has also been talking about how to use the map that Sonya Knetter has been working on (earlier presentation) and whether that could be used to replace the current habitat (key area) map. It's not as easy as it sounds since that maps aren't that identical. The SAC-TAT will meet in January or February for a day or two and try to get down to the meat of how these models work together and make a decision on how best to move forward.

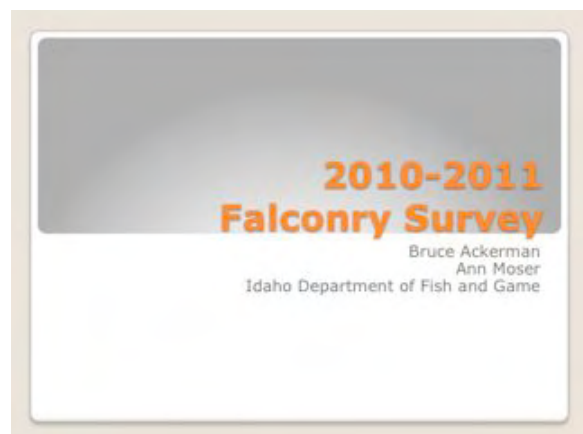
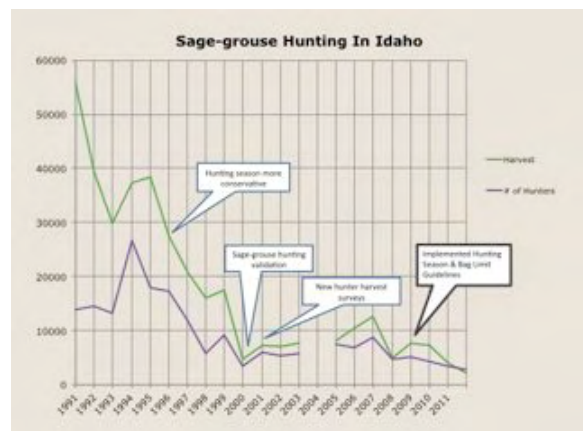
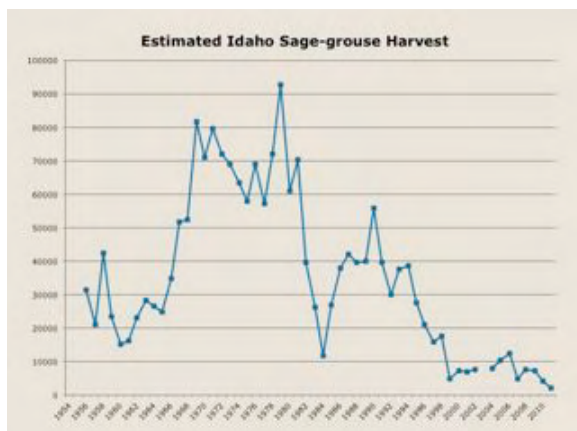
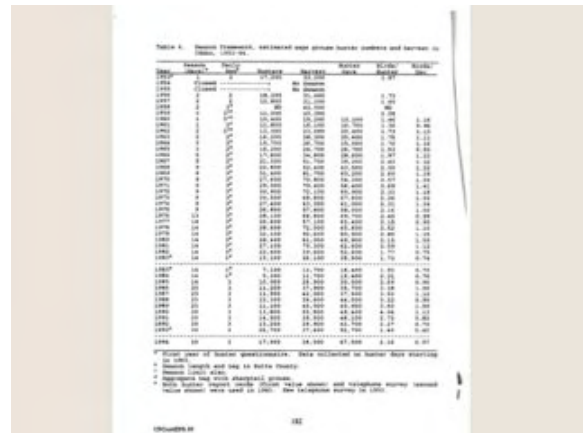
SAC Agreement:

- The SAC approved the new conservation measure addressing recreational events on sage-grouse habitat. The SAT-TAT will draft a letter with the approved language, recommending that the agencies implement the conservation measure, and requesting confirmation that the agency received the letter and conservation measure language. The SAC-TAT or SAC facilitator will send the letter to IDL, Idaho Parks and Recreation, BLM and the USFS. The new conservation measure will be posted on the IDFG web site with Chapter 6.

The Education Subcommittee did not meet and there was no report.

Summary 2011 Hunting Season and 2010 Falconry Season

Ann Moser gave the following presentation on the 2011 sage-grouse hunting season and the 2010 falconry season:



Chapter 6 - Implementation Information Revised October 2009

6.4.19. Falconry

Task	Responsible Party	2006-2008 Accomplishments	Next Steps or Target Deadline
6.4.19.1. Survey falconers annually to obtain monthly sage-grouse harvest data.	IDFG	Estimated annual falconry harvest in 2006.	Next Steps: Next survey spring 2010.
6.4.19.2. Review falconer survey data and updated data on sage-grouse lek attendance, and evaluate the falconry hunting season.	IDFG		Target Deadline: July 2010

- 159 Falconer permits
- 119 responses = 75% response rate
- Asked where the hunted (region), what species they hunted for and how many days
- Also asked for sage-grouse and sharp-tailed grouse harvest by month
- 37% said they hunted upland game animals (includes rabbits)
- 26% said they hunted migratory birds (ducks and doves)

Sage-grouse

2010-2011

Raw # falconers	Est # falconers	Raw # days	Est # days	Raw # birds	Est # birds	Birds/falconer	Days/falconer
20	25	438	551	46	58	2.28	21.8

*only 12 harvested sage-grouse

2005-2006

Raw # falconers	Est # falconers	Raw # days	Est # days	Raw # birds	Est # birds	Birds/falconer	Days/falconer
21	25	501	608	63	76	3.0	23.9

Gun hunters vs. falconers

Type	Days/hunter	Birds/hunter	Birds/day
Gun hunters 2010	1.98	1.15	0.58
Falconers 2010-2011	21.8	2.28	0.10
Gun hunters 2005	2.18	1.56	0.72
Falconers 2005-2006	23.9	3.0	0.13

Ann said that she just got the harvest estimates in on Monday at noon so she hasn't had much chance to work with them. IDFG started collecting data (hunter surveys) in 1953. Ann showed a slide with the typewritten version of the original data sheets to show how far things have come.

She explained that when they do their surveys they ask how many birds the hunters harvested and how many days they hunted. There have been a number of changes in how IDFG estimates harvest. Over the years, the daily bag limit has ranged from 1-3 birds and the season length has ranged from 1-30 days.

Before 2000 the way they tracked sage-grouse harvest was through a general survey of all hunters. Anyone who purchased a license was asked if they hunted sage-grouse. But that's a random survey and they wanted to be able to target the people who actually hunted the birds. That's why IDFG initiated a sage and sharp-tailed grouse validation in 2000. In 2001 IDFG got a new statistician and he changed the way things were done. Currently they send out questionnaires to people with the sage-grouse validations and then follow-up with a phone survey, this way they can better estimate the non-response rate so they're able to come up with a more accurate estimate of how many people actually hunted and got birds.

Several years ago when people were buying the sage-grouse permit, someone figured out that if a person lost their license they could pay \$1.50 to get a sage-grouse license that printed out all the other licenses that you bought. So lots of people figured that out and that made it harder to figure out which people were actually hunting sage-grouse. Two years ago the sage-grouse license went up to \$4.75 so now the permit costs more than it does to buy a replacement license.

Since 2008 IDFG has been tracking sage-grouse better and implementing seasons based on those specific reporting zones. In 2011 the Commission decided to change the opening day of the upland game season to October 1; it was previously the third Saturday in September. They changed it for all upland game birds. IDFG saw a big decline in birds harvested this year and a lot of people said they didn't hunt because they disapproved of the changed date.

Hunters this year were a little or a lot less successful. Production was pretty low this year so that could be a little of it. The estimated number of sage-grouse harvested this year was 2,144 the estimated number of hunters was 2,715. Last year it was 4,100 birds and two years ago it was more like 7,000 birds.

In terms of the falconry survey for 2010 to 2011, when we updated Chapter 6 of the state sage-grouse conservation plan we had two tasks related to falconry. One was to conduct annual surveys to obtain monthly sage-grouse harvest data. That arose from the concern that falconers have a long season that extends from August 15 to March 15. Also there was concern that falconers might be out there hunting on the leks in March. Last year IDFG sent a survey to the falconers. We got a very good response back (75%). In 2010 to 2011, only 20 falconers said they hunted sage-grouse with their falcons. We did a survey in 2005-2006 and the numbers were about the same. Falconers spent a lot of hours hunting with relatively low success rates; they are also not out on the leks in March (see slide for numbers).

Questions and discussion:

- Is there a difference in the bag limit between 1991 and 2000?
 - In 1991 the daily bag was 3, in 2000 the daily bag was 1.
- Don Kemner explained that because of different survey techniques, you couldn't necessarily compare the numbers. You can make direct comparisons among years with similar survey techniques. At face value, from 1991 to now sage-grouse harvest appears to be down by a magnitude of 10, but you can't really make that comparison.
- Are sage-grouse hunted like pheasant or do they just walk through and shoot them.
 - Most people use dogs, there are quite a few that don't and quite a few that ride around on OHVs.
- How much later was the season this year?
 - About two weeks later.
- Are they harder to find later?
 - That's a good question, we don't know. A preliminary look doesn't seem to indicate that they are less available or that they are less vulnerable. It is hard to really know. We don't ask in the hunter survey when they shot their bird.
- Don Kemner said because Oct 1 was a Saturday this year, in some parts of the state it overlapped with waterfowl season. So some folks commented that they had to decide between going waterfowl hunting or sage-grouse hunting. The commission will be setting seasons for the next two years at their January meeting. Even though sage-grouse seasons will not be set at that meeting, they will be considering whether they should move quails and chukars back to September or to another date. If you have an interest in what dates you'd like to see for the sage-grouse season, Don suggested that people should get involved in the public process for setting upland bird seasons. Don promised to send out an email notice when this is going to happen.

- Noticed over last 12 years that depending on whether or not it's a wet year or not, when the spring rains hit you can have quail nesting fairly late. Have seen a lot of quail that are really small sized come the middle part of September. Those extra two weeks that a person waits to hunt in October means a lot in relation to the size of bird and whether you'd want to shoot them. Do you have the same type of thing happening with sage-grouse?
 - That point about quail was one of the reasons the Commission changed the season to October 1. But there may also be a second brood; quail can do that but sage-grouse don't. As far as we know, sage-grouse don't shift their nesting that much based on weather conditions. Sage-grouse hunting has always been very traditional. Families go out in big groups. Changing the opening date from September to October really angered a lot of people because it messed with their family traditions.

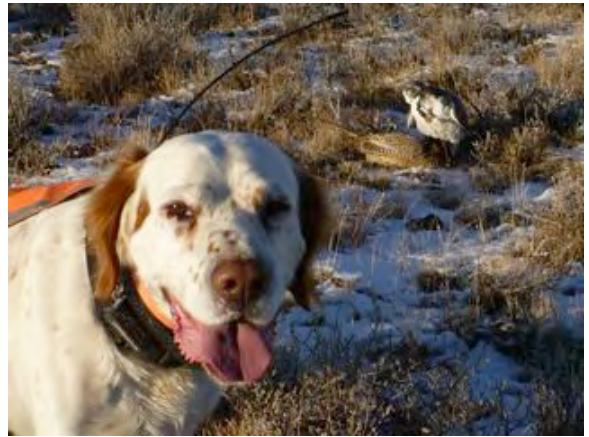
Falconer Presentation and Discussion

David Skinner brought his falcon and hunting dog to the meeting and gave the following presentation on sage-grouse hawking:





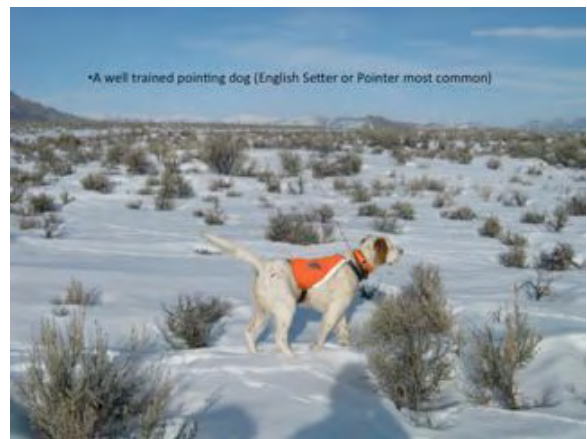






Requirements for Sage-grouse hawking:

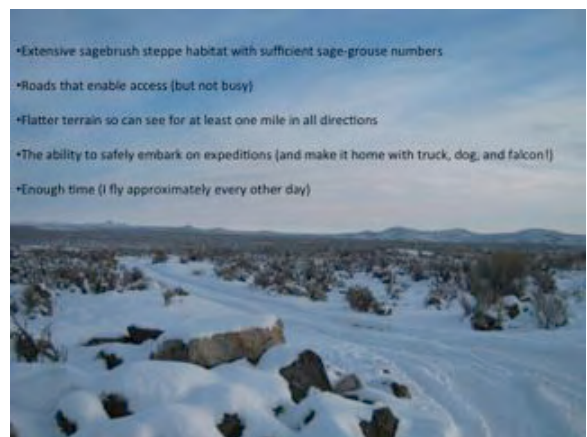
- Well trained falcon of sufficient size and skill (either sex of Gyrfalcon, female Peregrine, female Prairie, or hybrids of these)



- A well trained pointing dog (English Setter or Pointer most common)



- A reliable 4x4 with good tires and plenty of gas!



- Extensive sagebrush steppe habitat with sufficient sage-grouse numbers
- Roads that enable access (but not busy)
- Flatter terrain so can see for at least one mile in all directions
- The ability to safely embark on expeditions (and make it home with truck, dog, and falcon!)
- Enough time (I fly approximately every other day)

Lots of hidden dangers!

- Getting stuck (risk freezing to death)!
- Lose falcon due to tail chasing grouse off!
- Golden eagles!
- Risk to job and family from time spent hawking!



Result is: only 20 Idaho falconers attempted to hunt sage-grouse in 2010 and only ten falconers actually caught sage-grouse (IDFG Survey).



A total of 46 sage-grouse were caught by falconry birds in Idaho in 2010. The most caught by a single falconer was 14.



While the falconry season for upland game runs from mid-August to mid-March, no grouse were taken in either August or March in 2010. The 46 sage-grouse caught by falconers occurred September through February (fall and winter). No falconers pursue sage-grouse while they are actively strutting on leks.



Falconers have proven to be advocates for sage-grouse conservation:

- Most local working groups have falconer participation



•The North American Grouse Partnership (NAGP) was founded by falconers



David said he started hawking when he was 15 year old; his hawk's name is Gabriel. Using the picture slide show above David walked the SAC through the overall process he uses to take Gabriel out hunting.

Gabriel lives in the camper trailer. Before taking him out he gets fed, weighed and hooded. He's got transmitters attached to his neck and David's dog Jack has a transmitter too. Idaho is a great place to be a falconer and David lives near Fairfield, which is an ideal spot. The grouse are right there. After driving to the spot where they're going to hunt, David checks to see which way the wind is going. The dog needs to run into the wind or side wind to be able to smell. Jack runs the road and then smells the birds, than he goes on point. When David's sure that there's bird there he takes Gabriel out of the truck and puts him where he wants to be, then he takes off.

Gabriel tries to gain altitude so that he can go down to try to catch something. At this point David starts moving closer to the dog and Gabriel watches. Generally David or Jack flushes something. At that point Gabriel will be 200 to 1,000 feet above. He comes screaming down, they've clocked falcons at 200 miles per hour. Most of his catches are actually bigger than Gabriel is. David said his favorite technique right now it so try to grab them at high speed and go to the ground with the catch. Gabriel has caught one sage-grouse this month. They are hard to catch, especially in winter.

Falconry on sage-grouse is predominantly a winter activity. David said he flies Gabriel every other day and he gets to eat as much as he wants. Last year David caught 5 grouse. There are only so many raptors that can take a grouse. In raptors females are bigger than males. In winter the only raptor that's out there catching grouse is an eagle. Most predation is on chicks. To be successful at getting a grouse you need a well-trained falcon and a well-trained pointing dog. Roads are also critical because of

access. When Gabriel goes down after a grouse and the grouse flies off he can go a long way. At that point David doesn't want him to get the grouse because he's at risk from golden eagles.

In Idaho there are only 20 falconers who attempt to hunt grouse and there are about 10 people who go hunting for grouse regularly every year. The rest maybe go once a year. Mostly the season is November through February. David said that no one he knows chases birds while they are strutting. That's a no-no! Birds might start to stage on leks in early February or March. But mostly the falconers are hunting in winter areas and don't really see any strutting. Falconers are advocates for sage-grouse. Most of the LWG have a falconer participating in the group. Falconers founded the North American Grouse Partnership. The Idaho Chapter of the Grouse Partnership has been providing GPS locations of all the sage-grouse they see to IDFG.



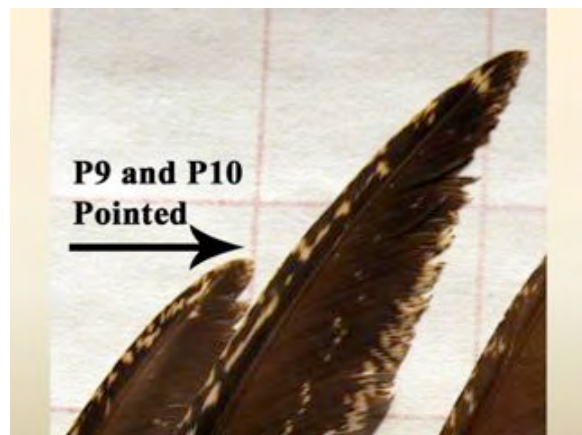
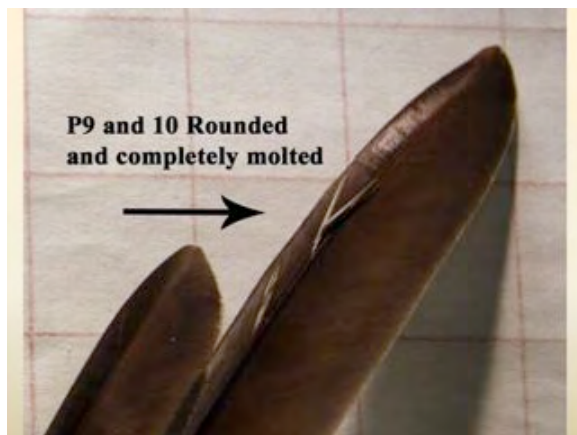
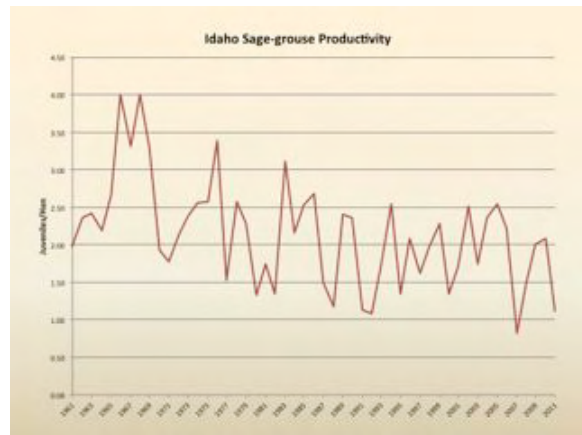
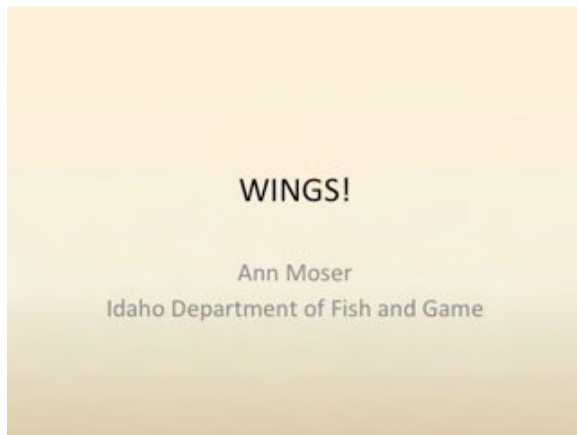
Questions and discussion:

- I've been told that different falcons have different ways of getting prey.
 - Large falcons try everything. The first year I had Gabriel he kept trying to knock grouse down. They try to hit their prey really hard.
- Does anyone use goshawks?
 - Just one guy I've heard of. They've got to be so fast right off the bat. Don't think a ferruginous hawk could do it.
- Why do you use hybrids? Do you keep him for lifetime?
 - They are captive bred. It doesn't really happen in the wild. The hybrids are created through captive breeding and artificial insemination. He's a gyr-peregrine. They have to be imprinted, raised from a baby with people. I had a peregrine that really liked my dust devil vacuum a lot – in a special kind of way. You can't intentionally just let them go. They've been making hybrids for 20 years. Don't think there are any issues with them. A peregrine or gyrfalcon would look at the hybrid and say – hey you just don't look right.
- How long do they live?

- o They can live to be about 20. Just like in the wild though something usually happens to them before that. So far I haven't had one killed by an eagle yet.

Sage-grouse Wing Demonstration and Discussion

Ann Moser led a working session for SAC members and other participants to learn how to age and sex sage-grouse wings. Following is a presentation and handout she provided to help guide the work session:





Handout: *Sexing and aging sage-grouse wings by measuring the 10th Primary*^a

Age	Sex	
	Female	Male
Juvenile ^b	0-125 mm	126-148 mm
Yearling ^c	127-149 mm	150-250 mm
Adult ^d	127-149 mm	150-250 mm

^a Begin counting from the tip of the wing.

^b Primaries pointed. Never molting first and second primaries.

^c First two primaries faded, ragged (juvenile plumage that has not been molted).

^d Primaries rounded. May be molting 1st and 2nd primary.

Ann distributed wing samples. She explained that IDFG tries really hard to get sage-grouse wings every year. IDFG gets them in four ways: (1) there are several mandatory check stations at key points throughout southern Idaho on opening weekend, (2) there are wing barrels, (3) wing envelope program, and (4) in the upper Snake they've recently put in wing kiosks.

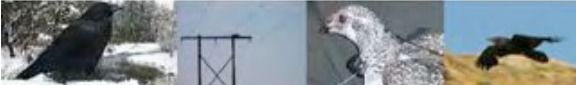
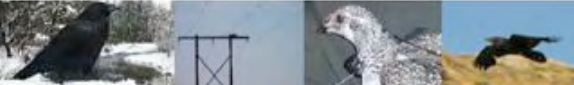
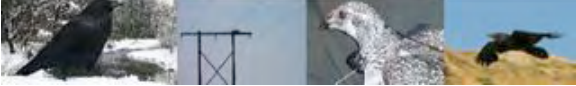
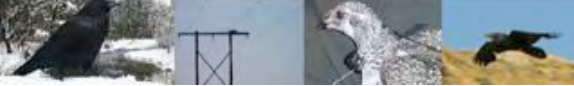
The envelopes cost about \$5 each so they can't afford to send them to everyone and target people they know are hunting sage-grouse. They just completed a wing bee a couple weeks ago and haven't had a chance to enter all of that data. They only collected about 400 wings this year.

They've collected sage-grouse wings since 1961 so it's a pretty good data set. In the early years they were getting about 7,000-10,000 wings. Ann noted that the decrease is alarming. The two worst sage-grouse production years ever recorded were in 2007 and 2011. The 2007 numbers made sense because there was a bad drought and lots of fires. But 2011 is a mystery.



Biology and Population Trends of the Raven (*Corvus corax*) in the Great Basin

Rob Lonsinger (IDFG) gave the following presentation:

Biology and Population Trends of the Raven (<i>Corvus corax</i>) in the Great Basin Rob Lonsinger, Regional Wildlife Biologist Magic Valley Region  	Ravens (<i>Corvus corax</i>)  • The largest passerine; member of the Family Corvidae • A native species to sage-steppe habitats • Evolved in concert with sage-grouse populations  
Raven Distribution  • Resident throughout most of the northern hemisphere (Boorman & Heinrich 1995)  	Raven Distribution & Habitat  • Occur in nearly all habitats across North America (exceptions, southeastern forests and the Great Plains) • Do exceptionally well around human altered landscapes including farms, rural settings, roads and other linear ROWs.  

Raven Food Preferences



• Generally, an opportunistic omnivore taking small mammals, reptiles, amphibians, birds, eggs, insects, fruit, grains, carrion, and garbage.

• Seasonality of raven spatial patterns likely associated with changes in food availability.

• Nesting ravens are territorial and will defend food sources within territory throughout the year. (Boerman & Heinrich 1999)



Raven Nesting



• Typically nest on cliffs or trees.

• Anthropogenic nesting substrates include powerlines, windmills, met towers, communications towers, buildings, bridges, etc. (Boerman & Heinrich 1999)

• A tendency to reuse nest or nest in the same location as previous years. (Steenhof et al. 1987)

• Nesting territory sizes vary, likely a result of differences in resource availability. (Boerman & Heinrich 1999)



Raven Population Trends



• Population estimations made difficult by:

1. large geographic distribution
2. temporal and spatial variation in densities
3. individual heterogeneity (i.e. territorial pairs vs. crowds).

• To assess changes in relative abundance at large spatial scales, I have used two measures:

1. Christmas Bird Counts
2. Breeding Bird Surveys



Raven Population Trends



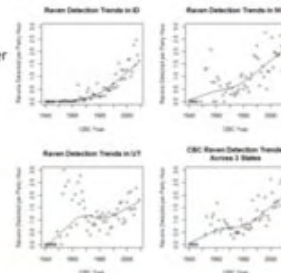
Christmas Bird Counts (CBC)

• Counts conducted during winter

• Have data back to the 1940's

• Counts are standardized by # ravens/party hour

• Indicate an increasing population trend



Raven Population Trends



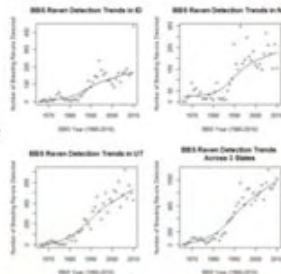
Breeding Bird Surveys (BBS)

• Counts conducted during spring/summer

• Counts back to 1966

• Counts indicate total number of ravens detected.

• Also indicates an increasing population trend



Raven Population Trends



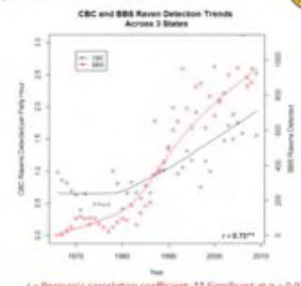
Christmas Bird Counts (CBC)

Vs.

Breeding Bird Surveys (BBS)

• As Expected:

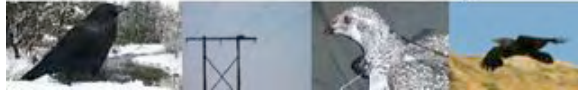
- Strong Positive Relationship
- Statistically significant



Raven Population Trends

Breeding Bird Surveys (BBS)

- Managed by the USGS
- Decreasing in the east
- Stable throughout most of the Rocky Mountains
- Increasing across the Great Basin with greatest increases occurring in Utah.



Anthropogenic Influence on Ravens

• Boorman (1993) defined a subsidized population as one that survives or grows "in part, because of food, water, or other limiting resources provided by or associated with human activities."

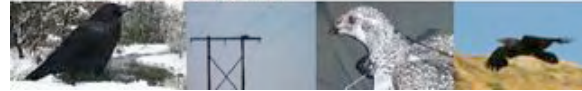
• Ravens fit this definition and are subsidized in many ways including:

1. Food – Road kills, garbage, and landfills
2. Water – Irrigation, reservoirs, and artificial water sources
3. Perch, Nest, and Roost sites – Transmission lines, distribution lines, buildings, fences, light posts, and bridges

(Boorman 1993, Boorman and Heinrich 1999)



(This list is not intended to be exhaustive)



Anthropogenic Influence on Ravens

- Factors affecting raven population trends likely vary from one site to another
- But at most sites, raven populations are subsidized in multiple ways

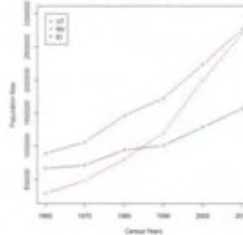
• So what is the underlying, driving factor to subsidization of ravens?

Human population growth



Human Population Trends

Population Growth by State



• As human populations grow, so does our influence on:

1. Infrastructure
2. Road kills
3. Garbage and landfills
4. Water developments

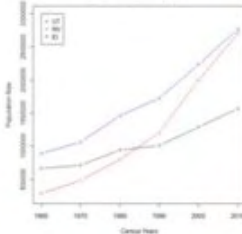
• We may expect then, that as human populations grow and subsidies increase, that raven population will also increase

• Anthropogenic subsidies provide sustenance year-round, increasing survival when natural resources are limited

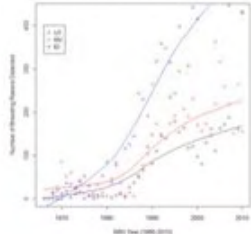


Human & Raven Population Trends

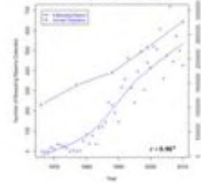
Population Growth by State



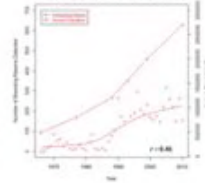
BBS Raven Detection Trends by State



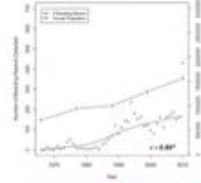
West BBS Raven Detection Trends and Population



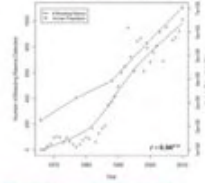
Northeast BBS Raven Detection Trends and Population



South BBS Raven Detection Trends and Population



Continental BBS Raven Detection Trends and Population



r = Pearson's correlation coefficient, *Significant at $\alpha = 0.05$, **Significant at $\alpha = 0.01$

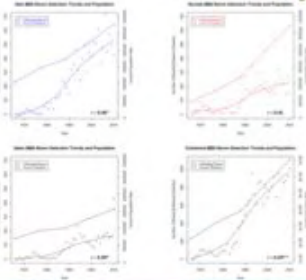
Raven & Human Population Trends



• Pearson's correlation coefficient is statistically significant for Utah, Idaho, and the pooled data

• All 3 significant analyses have strong positive correlations.

• Correlation does not equal Causation



Note: Census data includes the entire state, while BBS data includes only those survey areas within the Great Basin Ecoregion

r = Pearson's correlation coefficient
*Significant at $\alpha = 0.05$, **Significant at $\alpha = 0.01$



Ravens & Imperiled Species



• Predation by raven's has had negative impacts on multiple T&E species including:

1. Desert tortoise (Boersman 1990)
2. California condor (Dryder et al. 1986)
3. Least tern (Kestle 1992)



Ravens & Imperiled Species



What about sage-grouse?

• 2010 Decision: Predation not a significant threat in areas with good habitat.

• Raven interactions with sage-grouse have long been documented (Girner 1939)

• In Canada, sage-grouse nests were 8 times more likely to succeed in areas with low corvid densities (Maner and Hanson 2005)

• Recent headway in understanding interactions between ravens on sage-grouse

- Predation on Real and Artificial Nests in Shrubsteppe Landscapes Fragmented by Agriculture (Vander Haegen et al. 2002)
- The effect of vegetation structure on predation of artificial Greater Sage-Grouse nests (Watters et al. 2002)
- Relating grouse nest success and corvid density to habitat: A multi-scale approach (Maner and Hanson 2005)
- Greater Sage-grouse Nest Predation and Incubation Behavior (Coates 2007)
- Predators of Greater Sage-Grouse nests identified by video monitoring (Coates et al. 2008)



Ravens & Imperiled Species

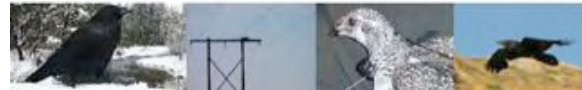


• Despite these efforts, we still need additional information on how anthropogenic subsidization of ravens influence raven and sage-grouse interactions, as well as effective mitigation techniques

3 Major Mitigation Strategies

1. Lethal removal
2. Behavioral modification (aversive conditioning)
3. Habitat modification

• Mitigation strategies should be done within a research framework in order to address effectiveness



Effectiveness of Mitigation Strategies



Lethal Removal

- Waterfowl, Oregon – productivity did not improve following raven removal (Smith 1976)
- Least tern, California – Lethal removal of ravens over a 5 year period did not reduce the proportion of eggs lost to raven depredation (Avery et al. 1993)
- Desert Tortoise, California – Following the lethal removal of ravens, numbers returned to pretreatment levels within 2.5 months (Kestle 1993)
- Sharp-tailed Grouse, Nevada – Nest success increased from 42% pretreatment to 75% during raven removal activities (Coates 2007)
- Sage-grouse, Nevada – Nest success was significantly higher in areas where ravens had been removed than expected based on 14 previous studies, but lacked knowledge of sage-grouse nest success prior treatment (Coates and Delahunty 2004)
- Egg treatment resulted in short-term declines followed by "reoccupation" of territories (Coates et al. 2007)



Effectiveness of Mitigation Strategies



Behavioral Modification (Aversive conditioning)

- Sandhill Crane, Oregon – Eggs injected with a chemical to induce sickness greatly reduced nest depredations and predation was reduced much more quickly in areas with territorial, nesting ravens (Kestle 1987)
- Least tern, California – Predation was reduced by using an egg injected with a chemical for aversive conditioning on a Least tern colony (Avery et al. 1993)
- Aversive conditioning may also provide indirect reductions of other nest predators



Effectiveness of Mitigation Strategies 	Summary & Conclusion 
Habitat Modification - Probably the most effective way to reduce raven numbers (Boersman and Hoenrich 1999) - To prevent use of a resource or to reduce the overall carry capacity measures should include limiting subsidies through: - Reduced speed limits and road kill removal programs - Excluding nesting/perching on transmission lines - Adjusting waste management programs (Boersman and Hoenrich 1999) - A key element to this approach is understanding which subsidies are sustaining populations. 	- Raven populations are increasing across the Great Basin ecosystem. - This population increase is likely driven by anthropogenic subsidization of ravens - Predation is not a major threat to sage-grouse in areas with high quality habitat - Long term efforts to reduce raven and sage-grouse interactions should include improving sagebrush habitat and reducing subsidies. - Mitigation strategies should be done in a research framework  

Rob explained that ravens are the largest passerine. They have evolved with sage-grouse on the landscape and they are one of the most widely distributed birds. They can be found throughout most of North America. They do really well in human disturbed landscapes. Most people think of them as scavengers, which is true to some extent but in general they are opportunistic omnivores. Raven distributions change throughout year depending on what's available to eat. Some literature states that nesting ravens are foraging up to 400 meters from nest, 570 meters has also been documented.

About 1980 seems to be time frame when raven populations really increased. Data supports what people have said anecdotally about seeing increases in the 1980s. Raven populations are actually decreasing in the east and in some places back east they're doing reintroduction projects. In most of the Rocky Mountain region the population is stable. In the great basin, i.e., Nevada and Utah we're seeing increase populations.

Questions and discussion:

- Are crows the same as ravens?
 - o They are two different species. Crows tend to out compete ravens in city limits.

Results of Raven Study on INL

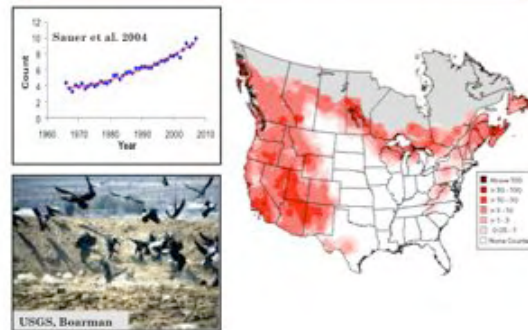
Kristy Howe (Masters student at Idaho State University) gave the following presentation on a raven study on INL:

Selection for Anthropogenic Structures and Vegetation Characteristics by Common Ravens (*Corvus corax*) within a Sagebrush-steppe ecosystem.

Kristy B. Howe and David J. Delehanty
Biological Sciences, Idaho State University
Peter S. Coates
USGS Western Ecological Research Center, Dixon, CA



Increase in Raven Populations and Expansion in Distribution

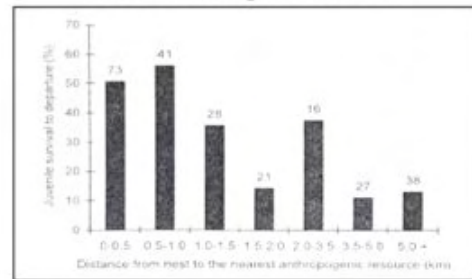


Common Raven
(*Corvus Corax*)
Intelligent
Versatile



Anthropogenic Subsidies

Landfills Increase Juvenile Survivorship of Ravens

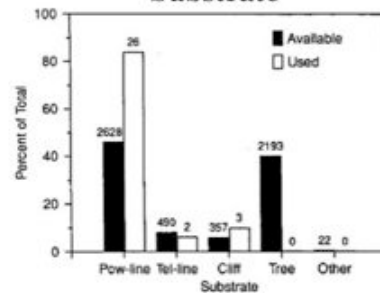


Webb et al. 2004. Common raven juvenile survival in a human augmented landscape. *The Condor* 106:517-525

Unnatural Nest Substrate

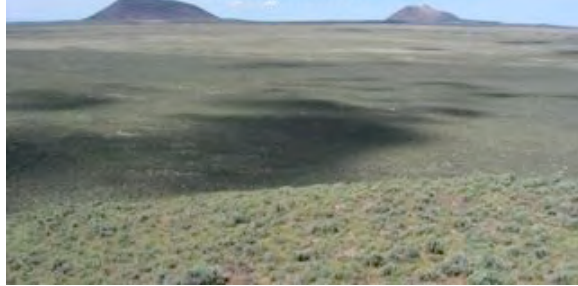


Used Power-lines for Nesting Substrate



Knight and Kawashima 1993. Responses of raven and red-tailed hawk populations to linear right-of-ways. *J. Wild. Manage.* 57(2):266-271.

What anthropogenic and natural features are associated with the presence of ravens and their nest locations in sagebrush ecosystems?



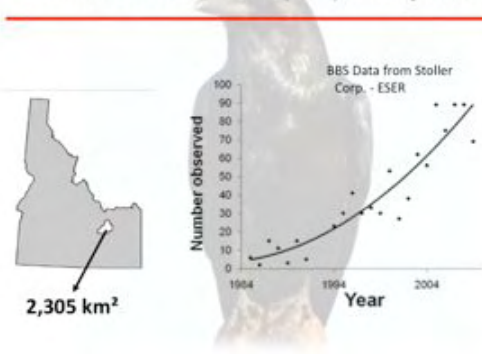
Raven Resource Selection in Sagebrush Ecosystem

Idaho National Laboratory

Research Objectives:

- 1) Calculate resource selection functions for territorial and non-territorial ravens
- 2) Identify anthropogenic factors

Idaho National Lab (INL) Study Area

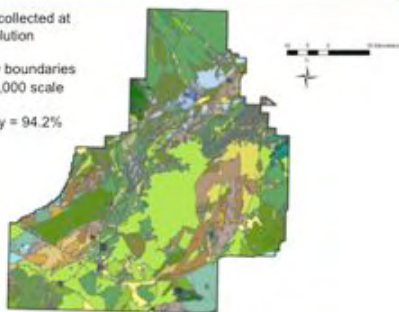


Complex Shrub-steppe Mosaic

Digital imagery collected at 1 M spatial resolution

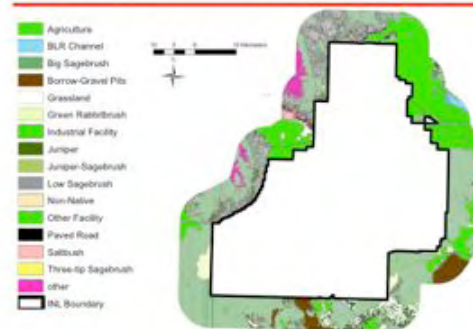
Veg. community boundaries mapped at 1:12,000 scale

Overall accuracy = 94.2%

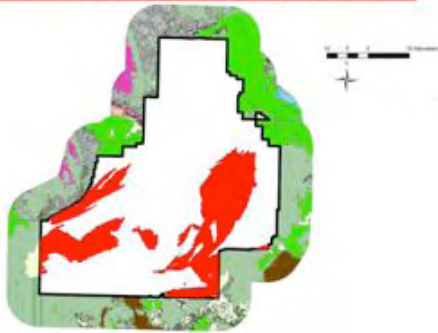


Map by Shive et al. 2011

INL & Edge Buffer: Ten Cover Types



Fires (1994 -2009) Influence Cover Types



Roads & Power Lines Present



Idaho National Laboratory Raven Surveys

Binomial Mixed Model
Approach

(used-available)

Spatial Scales

Surveys - 330.3 and 660.5 ha

Nests - 102.1, 660.5, 4048.9 ha

Explanatory Variables

Area of Vegetation Types (e.g.,
Juniper)

Distance to:

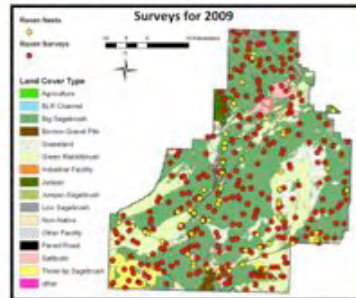
• transmission line

• facility

• paved road

• vegetation edge

Edge Indices



No. of random surveys was 1,045 (2007, 387; 2008, 330; 2009, 328)

Edge & Fragmentation Indices



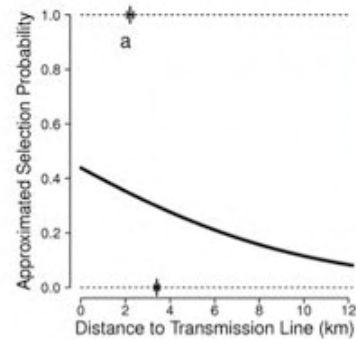
Raven Resource Selection

Model	K	L.R.	ΔAICc	w	χ^2	P
Power line, Facility, Non-native veg. (660.5 ha)	6	-753.77	0	0.4	35.46	<0.001
Power line, Facility, Edge Index (330 ha)	6	-753.89	0.3	0.29	35.21	<0.001
Power line, Facility	5	-755.55	1.6	0.08	31.89	<0.001
Power line, Facility, Paved Road	6	-754.74	2	0.05	33.52	<0.001

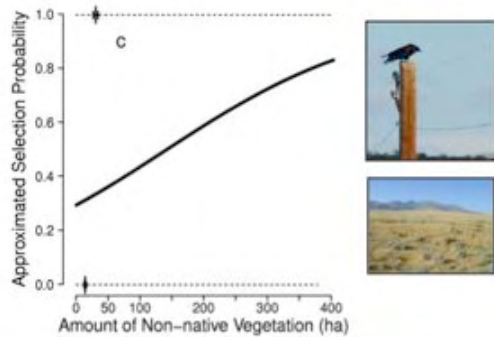
• Ravens selected areas with power-lines, facilities
and non-native vegetation

• We also found evidence for selection of
fragmented areas

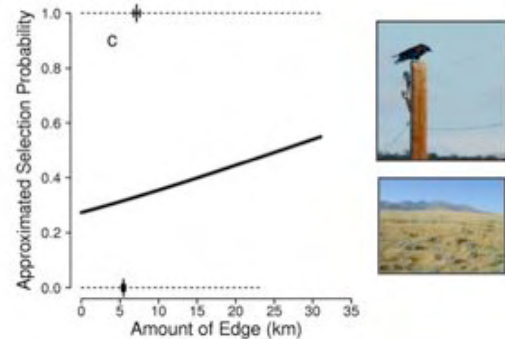
One kilometer away from line decreased odds of use
by 10.5% (95% CI, 3.5 – 18.5%)



Ten percent increase in non-native vegetation increased odds of use by 6.4% (95% CI, 0.12 – 13.4%)



One kilometer increase in edge increased odds of use by 3.8% (95% CI, 0.07 – 7.96%)



Post-Hoc Edge Analysis

Best approximating model consisted of big sagebrush/non-native vegetation (660.5 ha scale)



Raven Nest Resource Selection

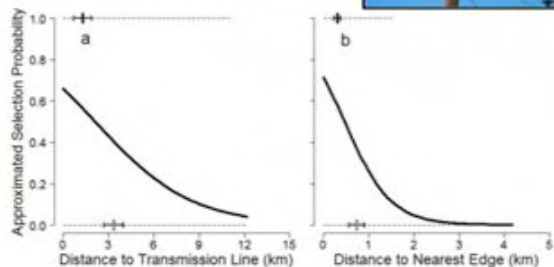
Model	K	LL	ΔAICc	w	P ²	P
Power line, Distance to Edge	4	-81.6	0	0.45	36.4	<0.001
Power line, Edge Index (102.1 ha)	4	-81.7	0.21	0.41	36.2	<0.001
Distance to Edge, Juniper Woodland (102.1 ha)	4	-83.1	3.04	0.1	33.4	<0.001
Edge Index (102.1 ha), Juniper Woodland (102.1 ha)	4	-84.7	6.23	0.02	30.2	<0.001

• Territorial ravens selected powerlines with relatively high amounts of fragmentation and nearby edge habitat

• Ravens also avoided juniper woodlands and juniper shrublands

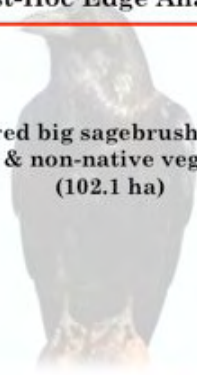
One kilometer increase in distance from power line decreased odds of nesting by 31.3%

One hundred meter increase in distance to edge decreased odds by 19.6%

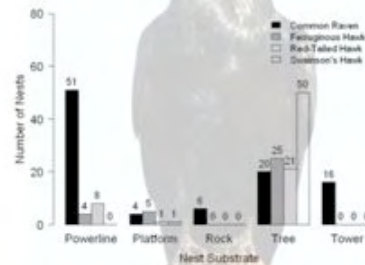


Post-Hoc Edge Analysis

Preferred big sagebrush/ native
grass & non-native vegetation
(102.1 ha)



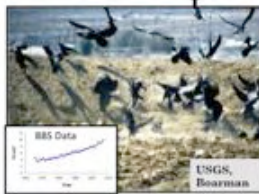
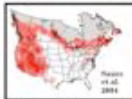
Ravens Use Artificial Substrates for Nesting More than Raptors



Important Interaction?

Increasing predator

*Common
Raven*



Loss of nest habitat



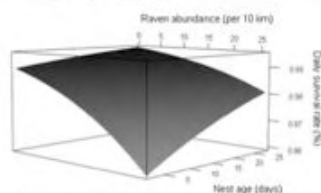
*Greater Sage
Grouse*



Image by Peter Coates

Greater Sage-Grouse Nest Survival Nests failed in areas of high raven abundance

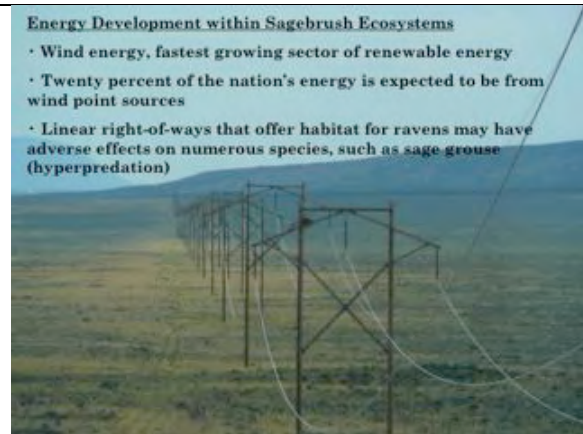
Model	Variables	K	ΔAIC	w
1	Raven/Nest Age	4	0.0	0.62
2	Raven	2	3.7	0.18
3	Raven + Nest Age	3	5.0	0.04
4	Raven + Visual obstruction	3	5.0	0.04



Coates and Delehanty. 2010. Nest predation of Greater Sage-Grouse in relation to microhabitat factors and predators. *Journal of Wildlife Management* 74:240–248.

Energy Development within Sagebrush Ecosystems

- Wind energy, fastest growing sector of renewable energy
- Twenty percent of the nation's energy is expected to be from wind point sources
- Linear right-of-ways that offer habitat for ravens may have adverse effects on numerous species, such as sage grouse (hyperpredation)





Kristy is a Masters Degree student at Idaho State University studying with Dr. David Delehanty.

Kristy said that raven populations have increased significantly in the western US in last 50 years. In the southwest, populations have increased 1500 percent. The prevailing hypothesis is that the change is caused by anthropogenic activities, specifically food and water subsidies and nesting opportunities.

Juvenile departure rates from nests increase as distance from the nest to nearest anthropogenic resource decreases. Ravens select unnatural nesting materials. In southeast Idaho INL represents one of largest and last remaining intact sagebrush habitats. It is an area of about 2,300 square km. Even though the site is closed to the public they have seen major changes to the landscape and an 11-fold increase in the raven population. That really started jumping up in mid 1990s at INL.

Questions and discussion:

- Want to clarify that the edge you talked about with big sagebrush and non-native vegetation is primarily crested wheatgrass.
 - Yes that's dominant. But I'm not saying there isn't cheatgrass and other species present too.
- Do you have any speculation about why they avoided junipers?
 - It could be they like greater visibility around their nest. Also if you're in a juniper a snake or someone could come and get your nest. If you're higher up, you're more protected. They like to have good visibility. When they did select junipers they selected lone junipers.
- We've been talking the last day or two on habitat mapping. What did you use for this study?
 - NAIP and their own imagery that was flown for the INL in 2007.

Relationship Between Human Footprint and Ravens

Steve Hanser (USGS) gave a presentation on modeling work the USGS is doing looking at the relationship between the human footprint (i.e., human impacts on the landscape) and raven populations. Unfortunately, the slides from the presentation did not translate on the Macintosh platform the facilitator uses so those slides are not available for inclusion in these notes.

Steve is a wildlife biologist with the USGS in Boise. He's been working on sage-grouse and sagebrush issues for the last 10 years.

The objectives of the study were:

- Define the human footprint
- Illustrate corvid model development and results
- Look at the human footprint in the West
- Look at the relationship between the human footprint and sage-grouse

Steve showed a map of the spatial extent of anthropogenic features. He explained that increasing human population trends, increases in infrastructure, development of two-track road, etc. all of that infrastructure development leads to interesting interactions with wildlife. As you increase anthropogenic disturbances you affect the ecological threshold to withstand disturbance.

Steve showed a number of slides showing the spatial extent of a variety of anthropogenic disturbances on the landscape including agriculture, railroads, urbanization, power lines, highways, rest areas, landfills, and roads. All of those features have a physical footprint on the landscape. What we can't see is the ecological footprint, which includes direct mortality, decreased connectivity (e.g., animals won't cross roads, etc.), exotic plant species, and increased predation. All of these together have a much larger impact than just the actual road or fence.

He showed an example of predator use of a campground in the Pacific Northwest where they did a survey of American crows. There's a bulls eye where the campground is but the affected area that is used by the crows spreads well beyond that beyond that bullseye.

Synanthropic species are species that benefit from humans on the landscape. Synanthropic species include the common raven, house sparrow, rock pigeon, coyote, raccoon and western kingbird. Synanthropic species influence the ecological footprint and may increase the impacts on some of the other wildlife populations in the area. An example is the impact on the food web. Predation by common ravens changes in habitat due to predators all result in changes in food availability. It works in two directions including the top down predator effect and the bottom up effect relative to food availability and habitat.

In any model you want to incorporate as many different aspects as you can. Steve showed a slide with a variety of predator models, which then can be "layered" on top of each other. The predator models include corvid occurrence probability, domestic predator cat model, domestic predator dog model, exotic plan occurrence, habitat fragmentation, oil and gas development, and human induced fires. The focus of this talk is on corvid occurrence probability. Steve said that in certain areas you're more likely to have crows and ravens. To determine occurrence probability they used different factors including presence of campgrounds, agricultural land, landfills, power lines, populated areas, interstates, state and federal highways, secondary roads, railroads and canals. They looked at predicted corvid presence risk for the American crow, common raven and the black-billed magpie. The used a BBS route from the years 1991-2001 and calculated the percentage of years they had detections on a specific route and the mean percent of years within those classes. Basically they found that the model was doing a pretty good job at predicting corvid occurrence probability.

They used the cat and dog models as a surrogate for urban landscapes and areas around high human density. They also looked at exotic plants, habitat fragmentation, etc. They tried to do grazing but the spatial data doesn't currently exist. Oil and gas and energy development wasn't that active when this

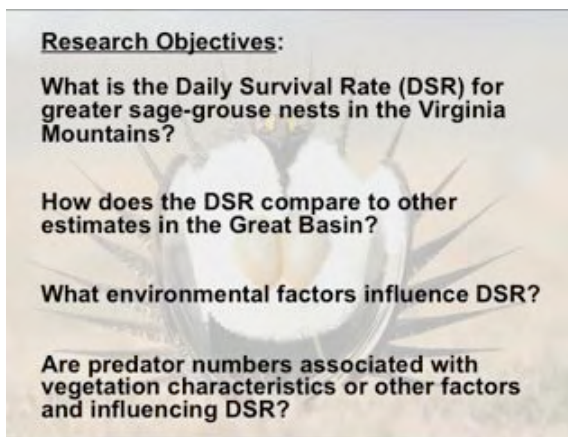
model was being developed so it wasn't included. They also tested the model with songbirds and looked at the house sparrow and sage sparrow.

They looked at how human footprints affect the West. The Idaho southern sage-grouse area is roughly equivalent to conditions across the West in general. In general, Federal lands have a lower human footprint than private and state lands. Wind and solar have higher impacts on federal lands, but this may be changing in the future. The human footprint is higher on lower elevations and higher productivity areas. They looked at the human footprint influence relative to population change between 1990 and 2000.

Steve talked about the limitations of the model. He explained that you need knowledge to inform models including foraging patterns of ravens and other synanthropic species, dispersal of exotic plant species, etc. You're also limited by the quality of the spatial data. This model was constructed using data from the early 2000s. There wasn't much information on grazing, power lines, roads, fences, etc. Also the roads layer may lack up to 60% of the actual roads. Additional factors include the role of roads and exotic plant occurrence in arid ecosystems, the role of roads and exotic plant occurrence in forest ecosystems, the role of roads and exotic plant occurrence.

Factors that Influence Sage-grouse Nest Predation

Zachary B. Lockyer (Masters Degree student at Idaho State University working with David Delehanty) gave the following presentation:



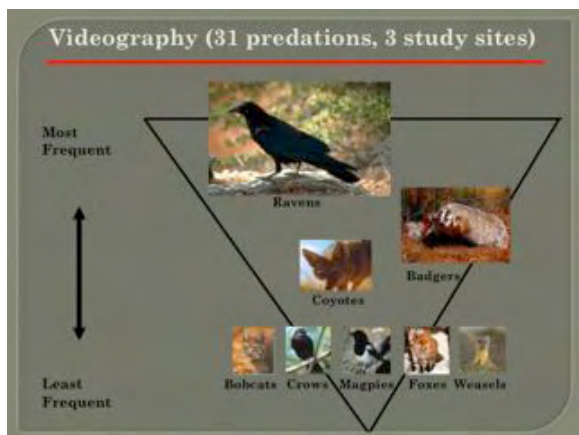
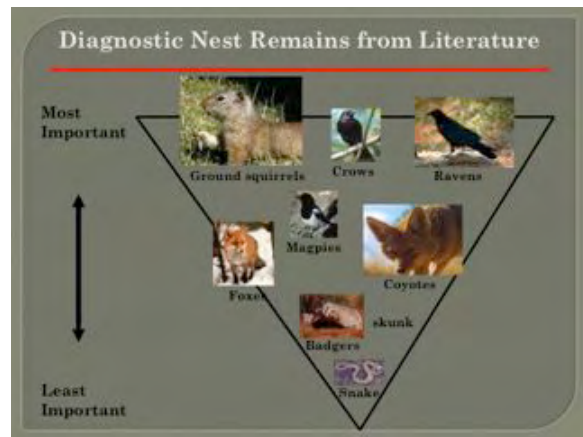
Virginia Mountains of NW Nevada

- Topographically Diverse Sagebrush Steppe
- Elevations range from 1,218 to 2,653 m
- 652.7 km²
- 1999 – 8,485 ha fire (Fish Fire)
- Proposed Wind Energy Development



Methods

- Captured and Radio Marked Grouse
- Monitored w/ Telemetry
- Conducted Vegetation Sampling
- Badger presence/absence surveys
- Raven/Raptor Point Count Surveys
- Installed Video-cameras at Nests (n=38)

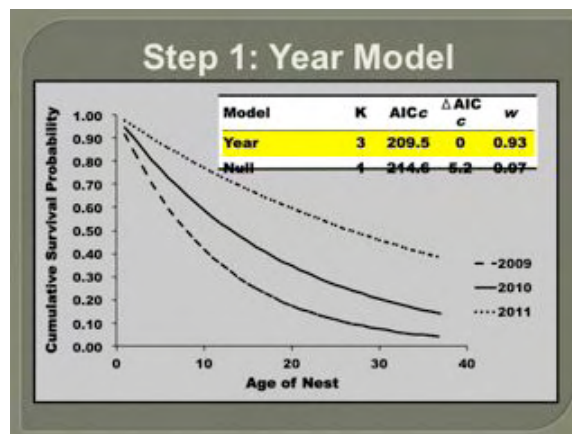
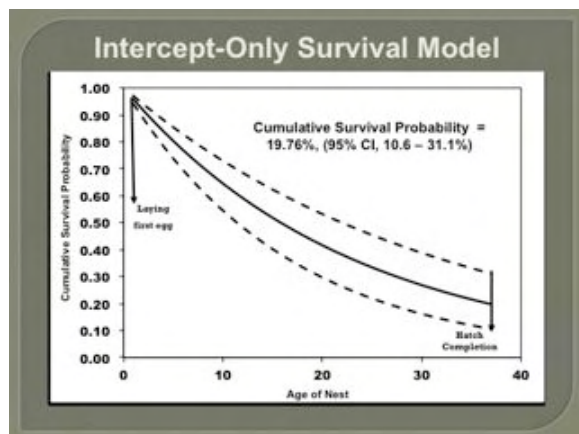


Three-Step Analysis Approach

First We investigated variation between years on daily survival probabilities

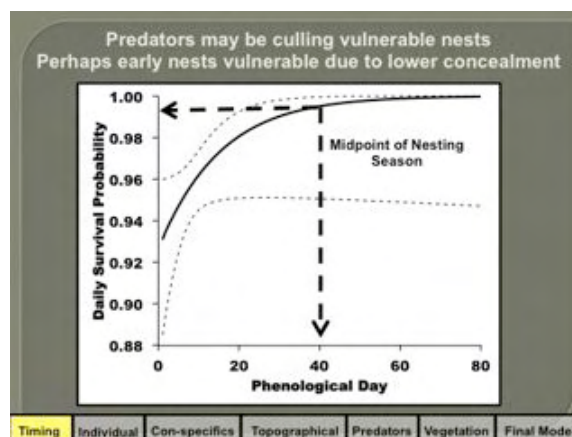
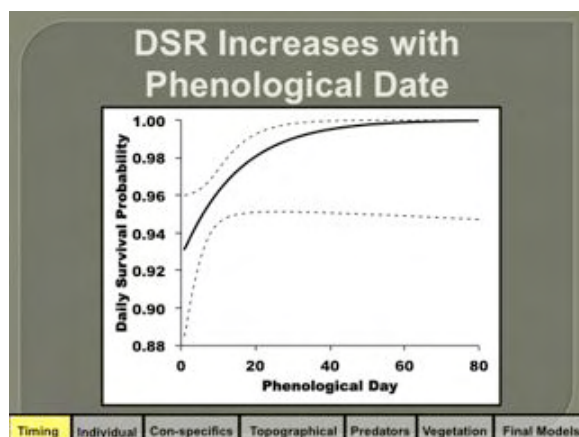
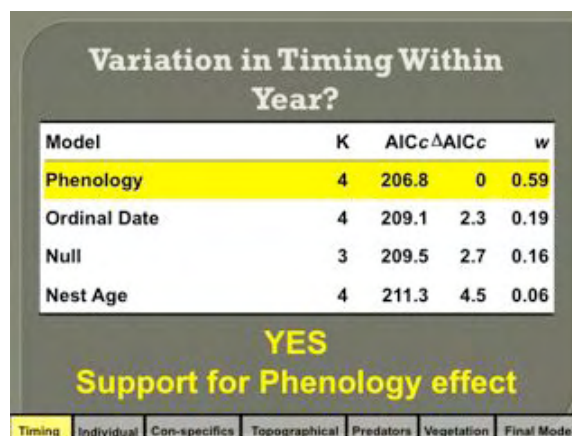
Second We investigated groups of models that shared similar covariates based on *a priori* hypotheses

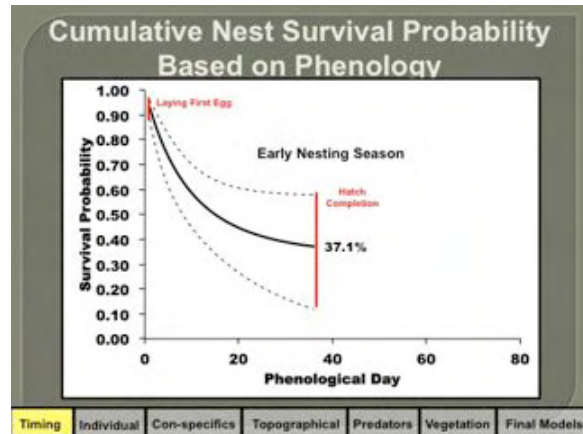
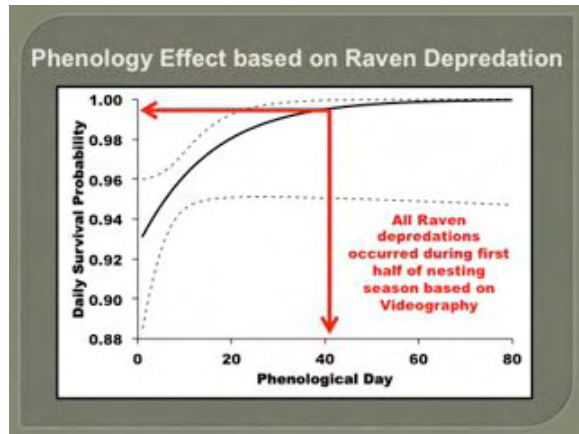
Third We developed and compared models within a final set based on factors identified as important in Step 2



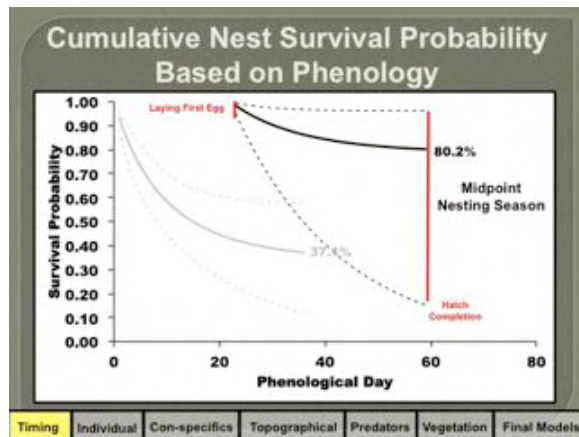
Step 2. Compare models using factors between groups

GROUP	COVARIATE	
1 Timing	Ordinal Date	Phenology
	Nest Age	
2 Individual	Bird Age	
3 Con-specifics	Number of Nests	
4 Topographical	Elevation	
	Slope	
	Aspect	
5 Predators	Raven Index (159 ha)	Badger
	Raven Index (660 ha)	
6 Vegetation	Field	
	Sagebrush Cover	GIS Percent Sagebrush
	Other Shrub Cover	Percent Pinyon/Juniper
	Nest Shrub Cover	Percent Invasive Grassland
	Vertical/Horizontal Cover	
	Annual Grass	
	Perennial Grass	
	Residual Cover	

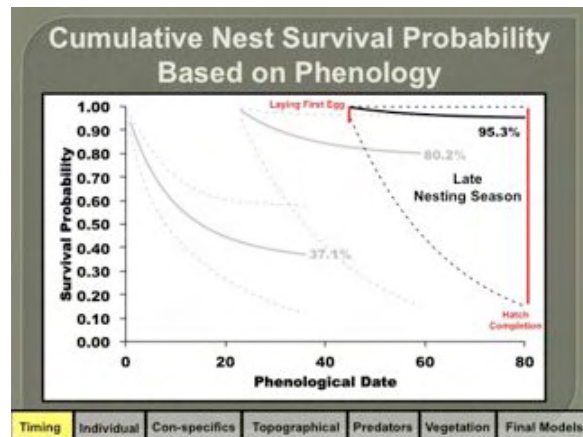




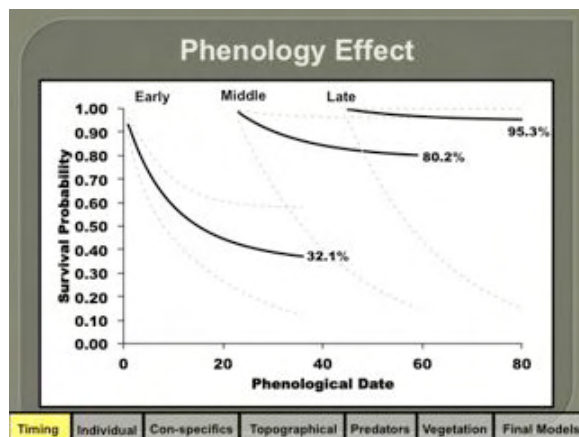
Timing Individual Con-specifics Topographical Predators Vegetation Final Models



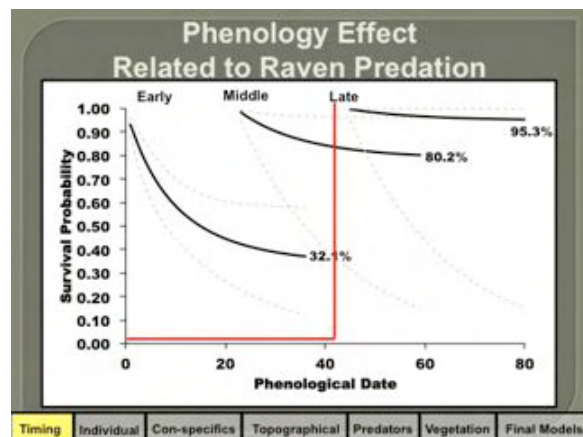
Timing Individual Con-specifics Topographical Predators Vegetation Final Models



Timing Individual Con-specifics Topographical Predators Vegetation Final Models



Timing Individual Con-specifics Topographical Predators Vegetation Final Models



Timing Individual Con-specifics Topographical Predators Vegetation Final Models

Individual Effects on DSR?

Model	K	AICc	$\Delta AICc$	w
Grouse Age	4	209.4	0	0.51
Null	3	209.5	0.1	0.49

NO
Grouse age effect not supported

Timing Individual Con-specifics Topographical Predators Vegetation Final Models

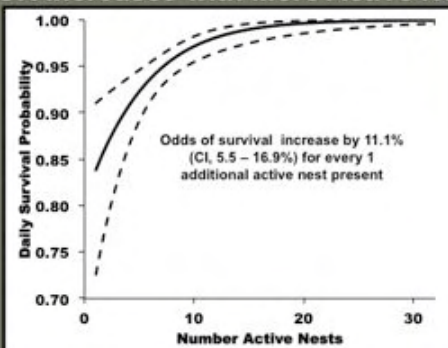
Con-specific Effects on DSR?

Model	K	AICc	$\Delta AICc$	w
Number Active Nests	4	193.4	0	0.99
Null	3	209.5	16.0	0.0

YES
Support for nest number effect

Timing Individual Con-specifics Topographical Predators Vegetation Final Models

DSR Increases with More Active Nests



Timing Individual Con-specifics Topographical Predators Vegetation Final Models

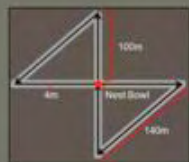
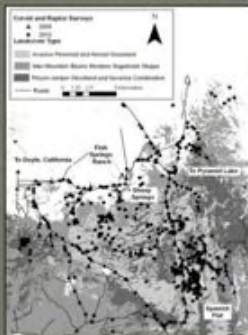
Topographical Effects on DSR?

Model	K	AICc	$\Delta AICc$	w
Null	3	209.5	0	0.42
Slope	4	210.2	0.7	0.29
Elevation	4	210.7	1.1	0.24
Aspect	7	214.3	4.7	0.04

NO
Topographical effects not supported

Timing Individual Con-specifics Topographical Predators Vegetation Final Models

Evaluating Possible Predator Effects



- Approximately 911 Raven/Raptor Surveys at Nest and Random Locations
- 195 Badger Surveys

Timing Individual Con-specifics Topographical Predators Vegetation Final Models

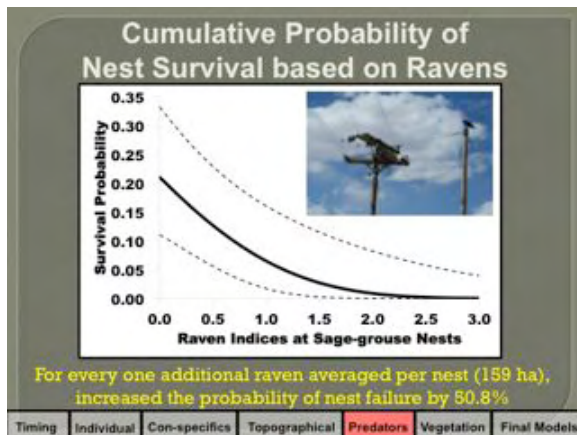
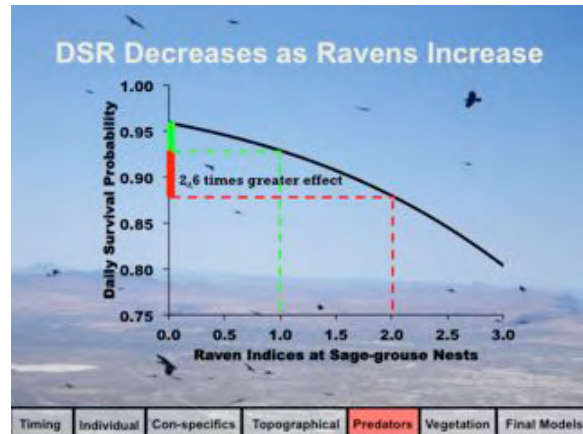
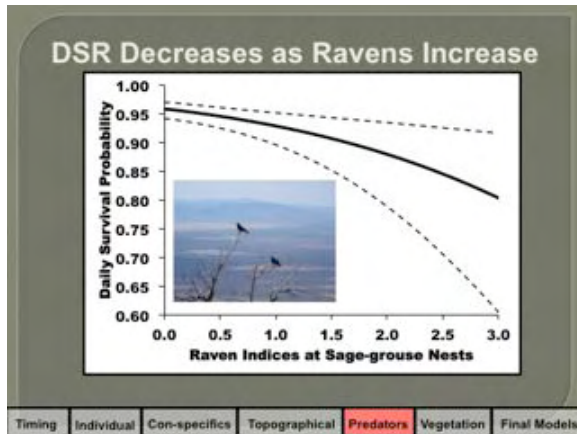
Predator Effects on DSR?

Model	K	AICc	$\Delta AICc$	w
Raven Index (159 ha)	4	206.1	0.0	0.79
Null	3	209.5	3.3	0.15
Raven Index (660 ha)	4	210.4	4.3	0.03
Badger Index	4	211.3	5.2	0.03



YES
Raven effects supported

Timing Individual Con-specifics Topographical Predators Vegetation Final Models

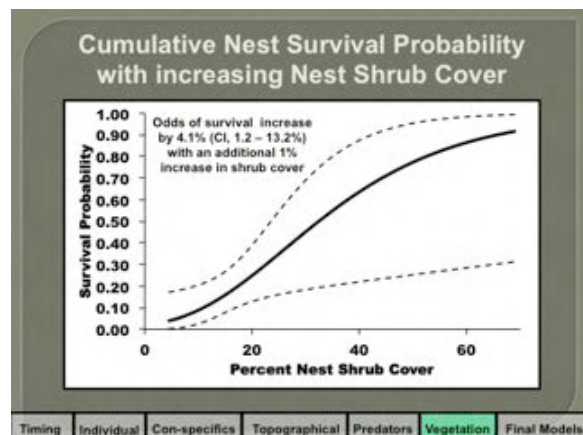
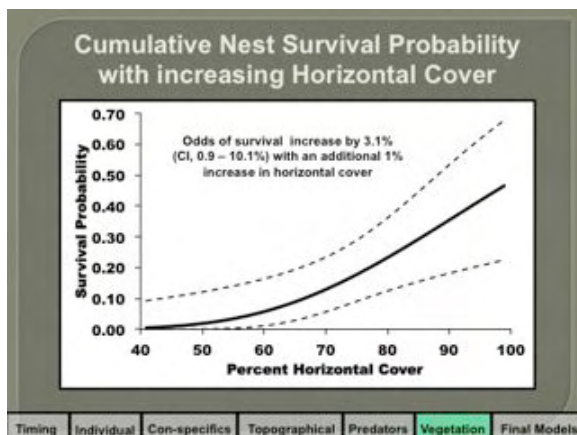


Vegetation Effects on DSR?

Model	K	AICc	ΔAICc	w
Horiz Cover	4	205.9	0.0	0.19
Perc Nest Shrub Cover	4	207.0	1.1	0.11
Total Shrub Cover (5m)	4	207.7	1.8	0.08
Perc Sage Cover (5m)	4	207.9	2.0	0.07
Total Shrub Cover (100m)	4	208.3	2.4	0.06
Total Shrub Cover (50m)	4	208.8	2.8	0.05
Total Shrub Cover (10m)	4	208.8	2.8	0.05
Total Shrub Cover (25m)	4	209.1	3.2	0.04
Perc Other Shrub (100m)	4	209.1	3.2	0.04
Null	3	209.5	3.5	0.03
Perc Sage Cover (10m)	4	209.8	3.8	0.03
Perc Other Shrub (50m)	4	209.8	3.9	0.03

Field vegetation effects Supported, NOT GIS scale effects

Timing Individual Con-specifics Topographical Predators **Vegetation** Final Models



Step 3. Compare models using factors between groups

GROUP	COVARIATE	
1 Timing	Ordinal Date	Phenology
2 Individual	Nest Age	
3 Con-specifics	Bird Age	
4 Topographical	Number of Nests	
	Elevation	
	Slope	
	Aspect	
5 Predators	Raven Index (159 ha)	Badger
	Raven Index (880 ha)	
6 Vegetation		
	Field	
	Sagebrush Cover	GIS Percent Sagebrush
	Other Shrub Cover	Percent Pinyon/Juniper
	Nest Shrub Cover	Percent Invasive Grassland
	Vertical Horizontal Cover	
	Annual Grass	
	Perennial Grass	
	Residual Cover	

Top Models

Model	K	AICc	ΔAICc	w
Number Active Nests	4	193.4	0.0	0.99
Horizontal Cover	4	205.9	12.5	0.00
Raven Index (159 ha)	4	206.1	12.7	0.00
Phenology	4	206.8	13.4	0.00
Nest Shrub Cover	4	207.0	13.6	0.00
Null	3	209.5	16.0	0.00

Top Models

Model	K	AICc	ΔAICc	w
Horizontal Cover	4	205.9	0	0.30
Raven Index (159 ha)	4	206.1	0.2	0.28
Phenology	4	206.8	0.8	0.20
Nest Shrub Cover	4	207.0	1.1	0.18
Null	3	209.5	3.5	0.05

Final Models

Model	K	AICc	ΔAICc	w
NumActiveNests + Phenology	5	182.7	0.0	0.879
NumActiveNests + NestShrubCover	5	187.5	4.8	0.078
NumActiveNests + HorizCover	5	189.1	6.4	0.036
NumActiveNests + RavenIndex(159 ha)	5	192.4	9.7	0.007
Phenology * NestShrubCover	6	201.5	18.8	0.000
HorizCover + RavenIndex(159 ha)	5	202.7	20.0	0.000
Phenology + RavenIndex(159 ha)	5	202.9	20.3	0.000
NestShrubCover + RavenIndex(159 ha)	5	204.9	22.2	0.000
Phenology + HorizCov	5	205.8	23.1	0.000
Null	3	209.5	26.8	0.000

Timing Individual Con-specifics Topographical Predators Vegetation **Final Models**

Major Findings

Low nest survival (19.76%, CI 10.6 – 31.1%)
Nevada Studies: 36% (Rehholz et al. 2009) 42% (Coates and Delehanty 2010)

Support for Phenology

Mechanisms: Culling - due to risky incubation behavior, lower concealment, both?, others?

Number of Active Nests

Mechanisms: Dilution, Satiation, Others?

Support for ravens at 159 ha scale

Support for horizontal cover and nest shrub cover

What this Means?

- Timing, Habitat, & Predators Matter
- Understanding these mechanisms together important
- Management aimed to increase nest success early in the nesting season might improve vital rates



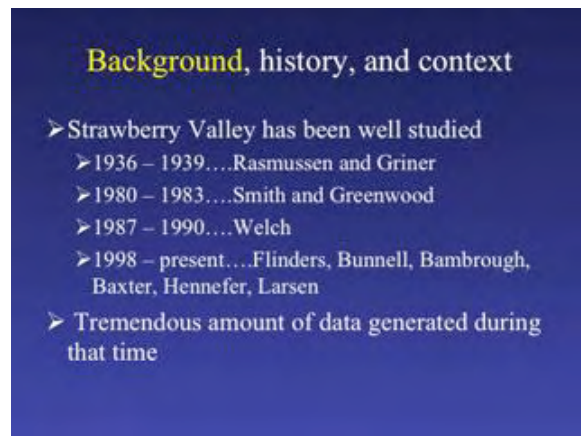
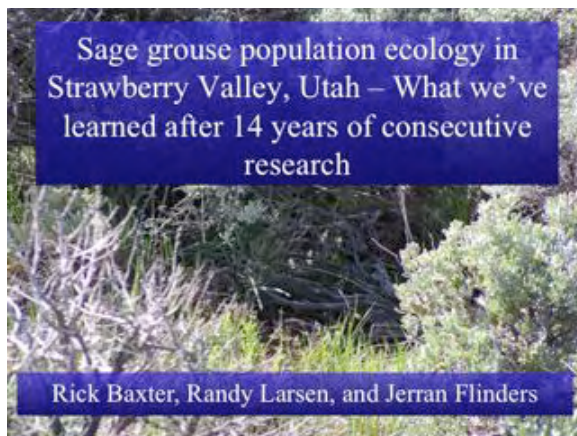
Questions and discussion:

- Did you actively search for other nests of other species?
 - No, just sage-grouse.
- Don't older birds tend to nest earlier?
 - I believe so.
- You're saying a greater number of nests have greater chances of survival but you might have more nests due to better availability habitat. Could that be what's involved?
 - We capture grouse at random and have a sub-sample of that population. So we have a random sample in that area.
- You said it was really important to improve early nesting success. How would you do this?
 - I don't know. Is this a habitat issue? Is it a predator issue?
- Was there grazing in this area.
 - Yes, but we're pretty far along in the season. Most of our nests are finished or pretty far along before the cows come on.
- I understood your points as being trying to increase nest survivability in that early period. How long does it take for the chicks to hatch?
 - Ann Moser responded that it's about 81 days from the first nest found to last nest. About 37 days from incubation to hatch.
- In two weeks on native plants you can get 7-12 inches of growth in very short period of time. If hens were nesting earlier before you got good growth that might be why you were seeing more raven depredation.
 - We know that ravens depredate the sage-grouse nests early in season. We found horizontal cover at the nest site. We can't say for sure if increasing cover would increase survival.
- What percentage of nests were in the late nesting period?
 - It's a smaller percent in the late and the early nesting periods. More of our nests were in that middle nesting period. All of our nests were first attempts.

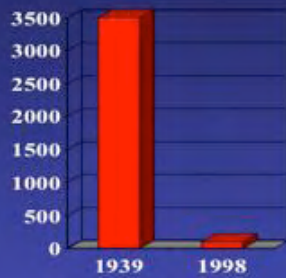
- Didn't see any models taking into account the effect of your activities. In some studies our presence at a nest site brings in the ravens. And that is potentially skewing the early nesting information.
 - We go in early in the morning and try to install cameras when the ravens aren't active yet. We wear rubber boots, scent masking, etc. We've found these cameras deter predators and don't attract them.
- Dave Delehanty said that they've been doing this work with cameras for a decade starting with Pete Coates. This question of whether we're drawing in ravens comes up frequently. We've tested it with and without video cameras. These are sage-grouse nest holes that have cameras and we're looking at the loss of eggs (with or without cameras). When we look for correlations with the timing of the camera placement we just don't find a relationship. When we look at early, middle or late nesting we don't find relationship with cameras. We think it is unlikely that there's any influence when we use these careful techniques. We look hard for that. The other thing to think about is that historically natural selection was probably supporting early nesting. They have prime juveniles going into the winter. The older females nest early. Historically probably if you're an old experienced female you nest early, but now there's a new predator in town. This new intelligent predator has great visual acuity. What we don't know is if that early nesting is still a pay-off strategy.

Sage-grouse Population Ecology in Strawberry Valley, Utah – What We've Learned After 14 Years of Consecutive Research

Rick Baxter (BYU) gave the following presentation:



Background, history, and context



History - reasons for the decline

- Flooding of valley to create a reservoir
- Heavy grazing by cattle and sheep
- Herbicide and mechanical treatments to kill sagebrush
- Heavy hunting



Lynn Griner - USGS - 1979

- Fragmentation of habitat
- Red fox (*Vulpes vulpes*) found late 70's early 80's
- Common raven (*Corvus corax*) is abundant
- Recreation— fish, camp, boat, hiking, ATVs, snowmobiling. Constant human pressure

Background, history, and context



- High elevation (7600 ft)
- Mesic mountain site
- Highly fragmented
- Migratory population
- Non-native red fox predation
- Few invasives – almost no cheatgrass

Original objectives in 1998

1. Identify factors limiting population recovery
2. Mitigate or remove limiting factors, if possible
3. Recover the population

Identify Limiting Factors

- Documented red fox predation (predators)
- Low chick:hen ratios
- Low female:male ratios
- Genetic bottleneck (Oyler McCance et al. 2005)



Identify Limiting Factors

- Seasonal habitat use
 - Not limiting due to population size, however.....
- Reproductive output
 - Nest initiation/success
 - Chick survival/recruit
- Movements



Mitigate/Remove Limiting Factors



Mitigate/Remove Limiting Factors

- Lek mowing (2005)
- Trout creek (2007)
- Chicken springs (2009)
- Road Hollow (2011)



Photos courtesy of Danny Summers

Mitigate/Remove Limiting Factors

- Division of Wildlife Resources
 - Created an easement (12,000 acre) with landowner on migratory winter use areas
 - Reseeded sagebrush
 - Purchased additional land
 - Increase habitat contiguity
 - P/J lop and scatter in migratory area
 - Chaining and reseeded
 - Gully plugs and pond resurfacing/reshaping
 - Raven treatments near Fruitland

Recover the population

- Translocations
- Almost all previous translocation attempts failed



Translocation success should be based on:

1. Survivability
 1. Compare annual survival by age class, year, and source population using known fate models in Program MARK
2. Site fidelity
 1. Compare movements of resident and translocated grouse
 2. Describe fidelity to the lek
3. Reproductive output
 1. Measure nesting propensity
 2. Compute nest survival using Program MARK
 3. Describe chick survival
4. Behavioral and genetic compatibility
 1. Barber 1991 and Oyler-McCance et al. 2005
5. Integration into the extant population
 1. Flocking with resident grouse

Reese and Connelly recommendations

1. Suitable year-round habitat
2. Birds should be captured on or near leks in the spring
3. Translocate quickly to the release site
4. Released via a soft release technique



Methods



Methods



Methods



Methods



Methods



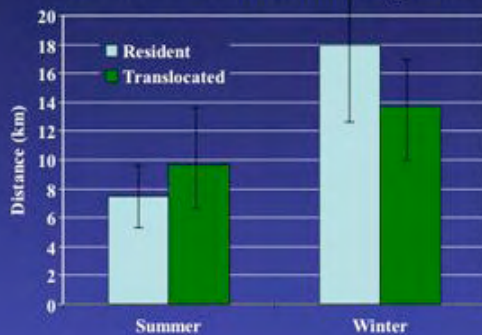
Translocation Results

- 395 sage grouse hens moved
 - 2 injured during capture
 - 1 died during transport
 - 5 self-injured
- With the exception of 6 grouse, average time to capture, transport, and release < 11 hours.

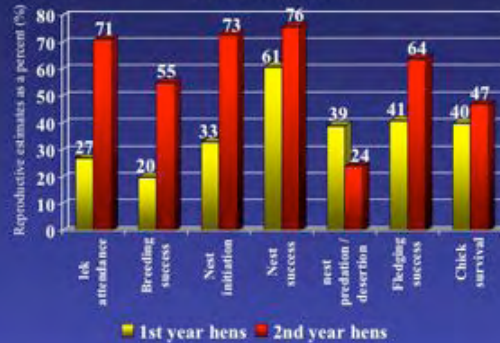
Translocation Results - Survival

	s	SE	LCI	UCI
Resident Adult Females	0.66	0.08	0.49	0.79
Translocated Adult Females	0.49	0.07	0.37	0.63
Resident Adult Males	0.57	0.09	0.39	0.73
Resident Yearling Females	0.64	0.09	0.45	0.79
Translocated Yearling Females	0.47	0.07	0.35	0.61
Resident Yearling Males	0.55	0.10	0.36	0.73

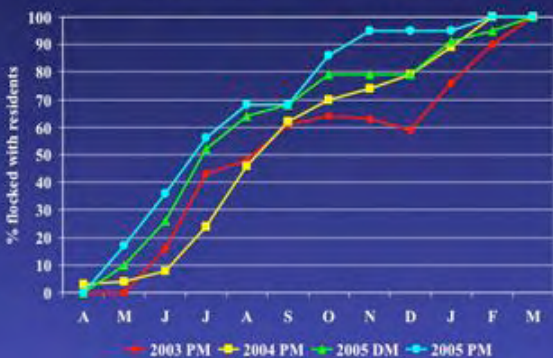
Results – Maximum dispersal



Reproductive estimates of 1st year vs. 2nd year translocated hens



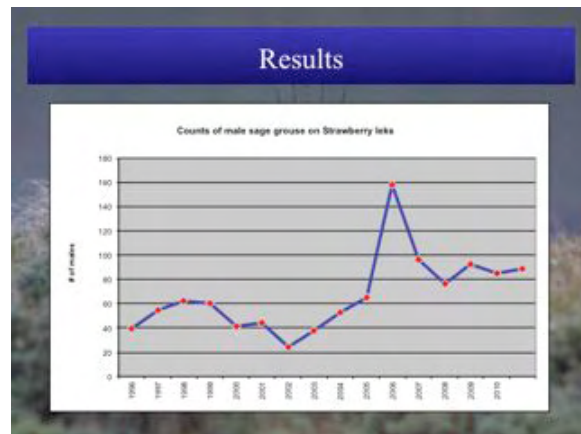
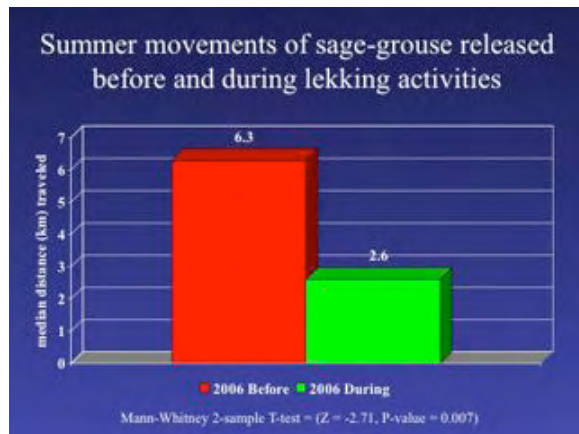
Results - Monthly flocking with residents



Timing – is it an issue?

- Synchrony of sink and source populations
- Lek timing of source population (PM, BEC, DLL)
- Lek timing of sink population (Strawberry Valley)

- Pre-lekking
 - 34 hens from PM
 - 26 hens from BEC
- During lekking
 - 8 hens from BEC
 - 34 hens from DLL



Lessons learned after 14 years of consecutive research in SV, Utah

- Long-term studies provide context and allow for multiple environmental and political influences to run their course
 - Instead of a 2-yr snapshot in time
- Translocations did work in Strawberry Valley
 - Timing crucial
 - Numbers of grouse
 - Predators and predator control are factors
- Adaptive management based on cooperation will improve our success in long-term population management

Acknowledgements

- Utah Reclamation Mitigation Conservation Commission – Dr. John Rice
- Brigham Young University – Dr. Jeram Flanders
- Utah Division of Wildlife Resources
- USDA – Forest Service Uinta National Forest
- USDA – Wildlife Services
- Sportsmen for Fish and Wildlife
- Local working group
- Private land owners

Unlike other populations the strawberry valley sage-grouse population saw more than a 95% decline. There were about 100-125 grouse a year killed on the old Highway 40 road. After radio collaring 650 birds, they had one killed by car in an area that wasn't used much by native grouse. Now there's a reservoir in the middle of the valley where there would have been prime habitat where the strawberry river would have run through.

They documented heavy livestock grazing, herbicide use, and lots of hunting in the 70s and 80s. It is a naturally fragmented landscape that has been more heavily fragmented. Red fox was a new player beginning in the 1980s. This coincides with time when fur prices were going to pot and people were opening up cages and letting them go. Recreation up there is busy too with about 1 million visitors a year. It's a high elevation area, 7,600 feet is the elevation of reservoir.

In late 1999 wildlife services came in and started to control predators. Mostly this was done with aerial shooting. It was a scorched earth policy. After the first couple years they started putting cartridges in natal dens, although they may have been refuge dens. Most grazing in the area was discontinued in 1999; the permits were bought out.

Questions and discussion:

- Has there been predator control since you did this work.
 - There was until 2008. Now we're trying to see what happens without it. We spent up to \$100,000 per year on predator control

- Do you have the criteria you used to determine if it was okay to take grouse from the source population?
 - Yes we tested each of those populations for disease. Also the Division of Wildlife wouldn't allow us to take anything that wasn't a stable or increasing population i.e., 500 or greater.
- You mentioned there were predator controls for fox and ravens. Were you able to detect the benefit of those two and separate them out? If so, which provided the best benefit?
 - We included both of those in a nest survival model and neither came out as being a factor. We noticed that they would key in on us and where we go. Many times you don't see them and don't see where they go. We did find areas that could have been bobcats, in other areas had holes pocked in eggs, but mostly they were just robbed clean.
- NRCS purchased about half of that 12,000 acre easement.
- You were saying that success relocating the grouse was related to putting them right next to leks. If you were going to put them into an area that didn't have leks or sage-grouse to create a new population how would you do it?
 - I wouldn't. Based on other studies there hasn't been any success reintroducing grouse into an area from which they've been extirpated.

How are Hunting and Predation Considered Relative to Previous Decisions on Listing Sage-grouse

Kathleen Rapley (USFWS) provided the following summary of the way in which hunting and predation was considered in the previous sage-grouse decisions.

Analysis of hunting on 2010 decision:

- Hunting sage-grouse is allowed in 10 of 11 states within range of the species.
- Harvest levels are considered compensatory, through this theory has not been rigorously tested.
- Annual sage-grouse productivity is low. Some research has indicated that harvest levels could be up 30%; state agencies keep harvest levels at about 5-10 percent.
- 2010 decision stated that loss due to hunting did not rise to the level of a threat to the species.
- States are very responsive to any problem: e.g., WNV outbreaks
- States change bag limits and season lengths/periods to mitigate for losses.

Analysis of predation in 2010 decision:

- 2010 decision: predation did not rise to the level of a threat.
- Grouse are prey! They have evolved with many of the predators that share the landscape. Some populations are more affected by predators such as ravens and red fox.
- Predators are only a threat where habitat is limited or in poor condition due to human activities. In some cases ravens are displacing other avian predators. Increased raven numbers are due to their attraction to human activities such as structures, dumps, road kill...
- Studies have shown that predator control can result in a short-term increase in productivity of grouse.
- Not an effective tool for the long term especially when the habitat is locking or in poor condition.

- Efforts should focus on improving/increasing grouse habitat...need more and better sagebrush!

Group Discussion on Hunting and Predation

- A question for Kristy: in regard to working on Federal projects where they're talking about putting a pipe line under ground (i.e., in energy corridors), when they did surveys for raptors they looked at power lines, do you have any thoughts about why on the ground were requiring them to put bird-b-gone little lollipops on ground but we don't do anything on higher structures?
 - More research should go into development of the next generation of deterrents. Some of the existing deterrents aren't working; others are actually propping up the nests. We need to look at different designs of transmission poles. That's probably why they haven't demanded they put them up, because we don't know what would actually deter nesting. As far as the underground pipelines, it is great its underground, but it should still include some rehabilitation because it's still creating edge.
- Natalie (Idaho Power) said a lot of focus has been on deterring perching (to prevent electrocutions) versus deterring nesting. A lot of deterrents have been used by birds to attach their nests to. We need to think about ways to design structures to preclude nesting. It is very difficult to deter perching but maybe it is more possible to do something about nesting.
- A question for Dr. Delehanty: when you look at raven predation, since they're visual predators they find nests by observing the hen. It seems like the ground cover would really be important.
 - Cover probably makes sense, but what might work even better is if there aren't any ravens in the landscape. Several times in today's presentations I've heard reference to the idea that sage-grouse evolved in the presence of ravens. But they did not evolve in the same habitat. To say that they evolved together and their behavioral repertoire was adapted to ravens is misleading. We think that sage-grouse females behave in a way that's different than the way that waterfowl would. Sage-grouse females may be much more vulnerable to visual predators.
- How do you accomplish no ravens in the landscape?
 - Delehanty said I'm not bashful, nor proud of fact that our lab did experiments with raven reduction in Nevada when no one else would do it. I don't think you can shoot or poison your way into sage-grouse nirvana. But we won't do it through speed limits either. We know for sure we need big expanses of non-fragmented intact habitat for sage-grouse. I would love to see power line located so that they run along the highway easements. We need to clean up road kills, and we need to make sure that we don't keep destroying sagebrush steppe. We need to clean up dumps. Locally we're looking at raven populations that are up 800-1000% maybe we can push to remove some of the anthropomorphic subsidies that help increase those populations.
- Kathleen with USFWS commented that they've been hearing lots of concern lately that there's been an increase in raptor species? Has anyone noticed that in their research?
 - Kristy said she didn't include raptors in with my analysis. In her view we have a healthy population of raptors on the land but they're not using these anthropogenic subsidies.

- Quinn Shurtleff said having looked at literature on the INL site in 70s and 80s there was a fair amount of raptor work. Lots of raptors were documented on the site. At least back then there was a lot of anecdotal and studies suggesting some pretty high raptor numbers.
- One of the slides earlier in afternoon said that predation effects are less in high quality habitat but it's important to note that the issue of high quality habitat is a very scale dependent issue. When you look at large sections of habitat you're hard pressed to come up with a large block of intact habitat. It is pretty fragmented with fire, invasives, etc. It is tempting to say yes lets just restore high quality habitat but there may not be that much opportunity to do that on a landscape basis.
- Don thanked all the speakers for their time and presentations. Gene Gray added that he really wanted to thank the speakers. Dave Ellis commented that he really admires folks coming in to do these presentations.

Follow-up:

- Provide speakers contact information in meeting notes:
 - Jon Beals (OSC), jon.beals@osc.idaho.gov
 - Kathleen Rapley (USFWS), Kathleen.rapley@fws.gov
 - Paul Makela (BLM), pmakela@blm.gov
 - Sonya Knetter (IDFG), sonya.knetter@idfg.idaho.gov
 - Ann Moser (IDFG), ann.moser@idfg.idaho.gov
 - David Skinner (USFS – Sawtooth Region),
 - Rob Lonsinger (IDFG), dskinner@fs.fed.us
 - Kristy Howe (Masters Degree student at Idaho State University working with David Delehanty), khowe1@q.com
 - Steve Hanser (USGS), shanser@usgs.gov
 - Zachary Lockyer (Masters Degree student at Idaho State University working with David Delehanty), N/A
 - David Delehanty (ISU), deledavi@isu.edu
 - Rick Baxter (BYU) was filling in for Randy Larsen (BYU), randy_larsen@byu.edu

Group Discussion on Wyoming Core Area Approach and Discussions in Idaho

- Gene Gray said some of us would be going to the meeting in Boise tomorrow. How is IDFG going to attack this? You're going to be the first they'll ask. What is the Department going to say about this approach?
 - Don responded that its fairly clear that IDFG wants to keep what's intact, intact. Their comments on China Mountain and on Gateway West are pointing out the shortcomings of the project proposals. RES the China Mountain proponent has come back after the initial public comments with some mitigation proposals. The state is reviewing the

mitigation proposals submitted by RES. It will be interesting to see what the State of Idaho does. Right now we're pretty adamant that we need to be careful about where we put infrastructure.

- Dave Ellis said, since Jon brought up the meeting that's being held tomorrow. This group was put in place by the State of Idaho as a sage-grouse advisory council for the state but we're being treated just like everybody else by the state. We're told at the last minute that you can just show up. But this group has more of a commitment and level of expertise than the general public. I talked to Jon Beals a little about this before he left today. I'd like to throw out onto the table the idea that we request that they come to us to talk about this. If they thought it was important to set up this group in the first place, then they should come to use this group to seek advice and tell us what they're thinking. What's integral to me is these LWGs and the amount of time we've put into developing LWG and state plans per the wishes of the State of Idaho. I would like to see us included more deeply in this. Jon sees the foundation of the LWG as part of this too. Other thing that bothers me, I read through all the handouts that Nate send out; I work day in and day out with BLM folks but it spooks me to think we could have one Federal agency making circles on a map saying this is what we should do.
- Alison polled the group to see how others felt:
 - Steve G. seconded what Dave said. We're supposed to be some type of body that has some say in this. Even though what we give is just a recommendation.
 - Neil H. said he agreed.
 - Dean Rose said he agreed.
 - Edmond M. said he agreed.
 - Gene G. said conceptually speaking he agrees but he feels the SAC is still involved and this is just an informational meeting. But he did agree that the SAC should have had more notice.
 - Karen F. said she agrees. She thinks what would likely happen if the state did decide to pursue a core strategy would be that they would look to the SAC to do the work.
 - Rob M. said he's really confused as to why the State of Idaho would ask Wyoming to talk about a new concept without coming to this group. Especially when it is scheduled on the heels of this SAC meeting.
 - Wendy P. said she agrees with Dave and Rob.
 - Paul said he agrees in general. But having said that, I think the meeting was more of an information-gathering thing. Conceptually at least the SAC-TAT are going to be there for the meeting tomorrow.
 - Richard S. said he thought the scheduling for the meeting should have been further in advance to allow people to come. He added that he thinks things will end up moving very fast if Idaho decides to follow the Wyoming approach.
 - Dave E. said that Jon's recommendation was to get through the meeting in Boise tomorrow and see what that looks like. Jon will let Nate Fisher know about the SAC's interest in being involved and promote that any future direction be discussed with the SAC.

- Edmund M. commented that his fear is that a decision will have already been made given the time lag and the politics that have gone on previous. They might want to have us develop something instead of give our recommendation as to whether this is a good management practice or not. The easiest thing is to write a letter to OSC and just say we want to make sure that we're in the decision-making process before a decision goes forward and that the SAC doesn't just want to be a mechanism that a decision made by others is implemented by.
- Don K. explained that OSC did give a presentation to ICA and IWGA in November about the core model idea. They had some discussions internally with legislators as far as scheduling the meeting for tomorrow that could be in part a function of Bob Budd's availability.
- Dave E. said his comment is that the SAC shouldn't just drop this. The SAC needs to do something to stay involved. At minimum we need to ask Don to keep the SAC up to speed and move fast to set up a meeting if we need to respond.
- Richard S. said that he thought the decision is closer than maybe we think. I think they're going to roll it out to the public and see if it gets holes shot into it. As soon as you pick up corridors there are livestock people who are not in it who won't care and others who will be really affected.
- Paul M. said we need to take a breath and see how the meeting goes tomorrow. There are big bold letters saying no decisions have been made yet. Don't know how fast it will be possible to expedite core area development.
- Wendy P. said she thought sending a letter from the SAC is the best middle of the road tact right now. It also takes the pressure off of both Jon and Don to have to be the messengers for the SAC while also upholding their other agency obligations.
- Steve G. said he agreed that the SAC should send a letter to go on record that we should be consulted and have some kind of roll. Not strident letter, but a respectful letter saying this is our role. Some of this group has spent hundreds of thousands of hours working on the state plan and sage-grouse conservation.
- Rob M. said he as wondering if the IDFG Director and OSC Administrator are actually still interested in the experience and knowledge of the SAC. If things do continue to roll out without any input from this group than the Directors are sending the message that the group isn't relevant to the discussion.

Follow-up actions:

- SAC members requested the Don provide the SAC with a written briefing on the December 1 meeting on the Wyoming Core Plan at the Capitol.
- SAC members agreed to send a letter to the IDFG Director and OSC Administrator (facilitator will write letter and send on behalf of SAC) regarding coordination on any future discussion, decisions related to Idaho consideration of Wyoming core area approach. SAC members directed Alison to draft a letter with the following general content:
 - Keep SAC informed
 - SAC is willing to, and interested in, participating in discussions

- o If Idaho (OSC or other) decides to move forward with core area strategy, would like to have role of SAC in process defined (since SAC was responsible for development of existing state plan)
- o The SAC members have demonstrated a strong, long term commitment to sage-grouse conservation, have committed a great deal of time and energy, and have experience in addressing the issue
- o Diversity of SAC membership, long-term working relationships among a range of stakeholders

Wrap Up and Adjourn

The next SAC meeting will be identified at a later date depending on the outcome of the core area discussions, funding availability and best timing to address other SAC issues.

Alison asked the participants to spend a little time providing some feedback on the meeting presentations. Which presentations were the most helpful, thought provoking or interesting? What information will SAC members be taking back to their LWGs? What additional presentations would they like to see at future meetings? Each participant was given two dots to “vote” for the presentations that they found the most valuable and interesting and were asked to provide additional comments.

Following is the summary of input received:

Topic	Votes	Comments
Funding Update (Jon B. and Don K.)	0	
USFWS Decision on Listing Update (Kathleen R.)	2	• Helps us understand more about where the USFWS is coming from.
Sage-grouse Priority Area Analysis (Paul M.)	1	• Pretty “techy”, we need to talk more about implications
BLM Sage-grouse Planning and Policy Update (Paul M.)	4	
Seasonal Habitat Modeling (Sonya K.)	3	• Very good. Should be valuable in putting together a new range-wide map. • Good product, thanks. • Will be very helpful in project planning and avoiding adverse impacts.
Sage-grouse Biology 101 (Ann M.)	4	• Excellent for educating school groups, agency managers, others without a wildlife background. Can we get a copy? • Finally, we get to talk about the birds!! • Cool.
2011 Hunting Season and 2010 Falconry Summary (Ann M.)	1	• Good – should do every year.
Falconer Presentation and Discussion (David S.)	3	• Good. • Loved this one. • Excellent help eliminate a concern some SAC members had. • Very interesting. • Excellent.
Sage-grouse Wing Demonstration (Ann M.)	4	• Good demo. • Very good. • Excellent.

Topic	Votes	Comments
		Great hands-on activity.
Biology and Population Trends of Raven in the Great Basin (Rob L.)	2	- Good. - Nice summary/overview. - Good job Rob.
Results of Raven Study on INL (Kristy H.)	3	Interaction between predation and edge and non-native vegetation very informative.
Human Footprint and Ravens (Steve H.)	7	
Factors that Influence Nest Predation (Zack L.)	8	Very good.
Sage-grouse Population Ecology in Strawberry Valley (Randy L.)	5	
What would you like to learn about or have a presentation on at the next SAC meeting?	N/A	- Put all Idaho telemetry studies together to give a vision/magnitude of what is being learned. - Include any upcoming management plans/planning that could be considered, i.e., like Wyoming plan.

Don adjourned the meeting and thanked everyone for their dedication and participation.