
BIGHORN SHEEP: SUPPLEMENTAL ANALYSIS TO THE FOREST PLAN ENVIRONMENTAL IMPACT STATEMENT—COMBINED TEAM MEETING

Payette National Forest Supervisor's Office—McCall, Idaho

August 18 and 19, 2009

ATTENDEES

- Christine Bradbury, Payette/Clearwater/Nez Perce National Forests Tribal Liaison
- Sue Dixon, Payette National Forest
- Craig Ely, Oregon Dept. of Fish and Wildlife
- Steven Goodson, Office of the Governor of Idaho
- Pete Grinde, Payette National Forest
- Maura Laverty, Payette National Forest
- Keith Lawrence, Nez Perce Tribe
- Mike Lopez, Nez Perce Tribe (Day 2 only)
- Donny Mortorello, Washington Department of Fish and Wildlife (Day 1 by phone, Day 2 present)
- Chans O'Brien, Payette National Forest
- Josh O'Brien, UC Davis
- Darcy Pederson, Nez Perce National Forest
- Laura Pramuk, Payette National Forest
- Suzanne Rainville, Payette National Forest Supervisor
- Tim Schommer, Wallowa-Whitman National Forest
- Pattie Soucek, Payette National Forest Planner/Interdisciplinary Team Leader
- Claire Thunes, UC Davis (By phone)
- Dale Toweill, Idaho Department of Fish and Game
- Leander Watson, Shoshone–Bannock Tribe (Day 1 only)
- Paul Wik, Washington Department of Fish and Wildlife

PROCESS SUPPORT

- Susan Hayman, Facilitator, North Country Resources, Inc.
- Nikole Pearson, Documentation, Peak Science Communications

MEETING OBJECTIVES

1. Receive a briefing on the core herd home range population and foray models and an update on the disease model.
2. Review the results of the preliminary risk analysis for the for the alternatives presented in the draft environmental impact statement (EIS).
3. Discuss and identify other potential alternatives to develop and run through the risk analysis model.

ACTION ITEMS

| What | Who | When |
|---|----------------|--------------|
| Database training session | Soucek | Today |
| Email information missing from the content analysis/ Issue Resolution Table to Pattie Soucek | Combined Team | August 26 |
| Send dataset of counts by game management unit or herd for Rocky Mountain or California bighorn sheep to Josh O'Brien | Wik and Ely | August 28 |
| Assess the data UC Davis possesses, determine what is needed, and make specific requests to States | J. O'Brien | August 28 |
| Provide "plain English" version of model to Combined Team | J. O'Brien | September 4 |
| Resolve the definition of "occupied habitat" | Forest Service | September 14 |

DAY 1—AUGUST 18, 2009

OPENING

Welcome

Suzanne Rainville (Payette National Forest [NF]) welcomed participants and thanked everyone for attending and providing the required letters. The purpose of today's meeting is to share work completed on the models. Rainville reminded participants of the rigorous environmental impact statement (EIS) process. The EIS must portray a full range of alternatives, and some will have significant effects. The Payette NF is not asking for consensus or agreement, but wants to hear concerns and areas of missing data or analysis.

Susan Hayman (North Country Resources) asked participants to introduce themselves and reviewed the meeting objectives and ground rules. Since the first day will be spent reviewing the models, the second day agenda was changed to incorporate a morning feedback period (Appendix 1).

PROCESS UPDATE

Issue Resolution Table

Pattie Soucek (Payette NF) distributed the updated *Issue Resolution Strategy* based on the content analysis. This draft document includes comments submitted during and after the official comment period. Before Rainville reviews and approves the document, the Interdisciplinary (ID) Team will provide review and comments. Combined Team members are welcome to review the table and contact Soucek if their comments are missing.

Sue Dixon (Payette NF) is building the Response to Comments appendix for the final supplemental environmental impact statement (SEIS). The appendix will not include the table distributed by Soucek, but will include a response to comments that was received on the DSEIS. The significant issues will be used to develop alternatives and/or analyze the alternatives that will be included in the final SEIS.

Soucek also distributed CDs containing the database of all of comments received during the formal comment period. Soucek will provide a training session for anyone interested in learning how to navigate the database.

Because of a recent court ruling involving the Payette NF or challenges to Forest Service general technical reports (GTRs), the Forest cannot use the *Risk Analysis of Disease Transmission between Domestic Sheep and Bighorn Sheep on the Payette National Forest* (USDA Forest Service 2006a), *Summary of the Science Panel Discussion* (USDA Forest Service 2006b), or *A review of Disease Related Conflicts Between Domestic Sheep and Goats and Bighorn Sheep* (USDA Forest Service 2008) during this process. UC Davis will respond to the science-based comments received; these responses will replace the science panel document. The Payette NF asked for letters from each elected leader of the groups represented in the Combined Team to indicate that each team member has the authority to act as a representative.

MODEL BRIEFING

Viability Determination

Soucek reminded participants of the ultimate goal: providing source habitat well distributed across the landscape that ensures a viable bighorn sheep population on the Payette NF. The ID Team needs to ask the following: how much of the source habitat needs to be made available, where is it, how well connected is it, and how much needs to be made available to reduce contact and disease transmission. Two population models have been developed to answer these questions: core herd home range and foray.

- Each alternative will be presented with the probability of contact per year that will be input into another model.
- The models will be run twice: once for a healthy herd and once for a diseased herd.

- The original alternatives still need to represent a full range of risk using the new models.

Core Herd Home Range Population Model

Chans O'Brien (Payette NF) displayed the model developed for the draft SEIS and highlighted some of its drawbacks:

- The original model aggregated all observation points for individuals; the new model analyzes each individual separately.
- The original model analyzed points throughout the year; the new model analyzes the observation points seasonally (summer: May–October; winter: November–April).
- The original model used a 100% contour; the new model uses a 95% contour.

C. O'Brien displayed the new model. Some home ranges were based on personal observations and being called areas of concern since the exact location of these herds was unknown. Since probabilities are weighted by herd size, these small populations will not be weighted as heavily but will be included in the analysis.

- The Josephine Lake sighting was not included as an area of concern, however is accounted for in the Foray Model.
- This core herd home range model will be updated with additional data.
- The Hells Canyon population will be used to determine how well early observations estimate the total population. This analysis will be included as a narrative in the final SEIS.
- Retrieving the latest data has been problematic.

Foray Model

C. O'Brien displayed a graph of the maximum ram forays. To develop the foray model, the original analysis was extended to 35 kilometers (km), a straight-line buffer in 1.0 km bands was developed, and the probability that an animal would travel through each band was calculated. For example, if a ram travelled to the 35.0 km band, it also travelled through the 1.0 km band, the 2 km band, etc. However, each animal that leaves the home range will travel a different distance—100% will travel through the 1.0 km band, 95% to the 2.0 km band, etc.

Modelers incorporated habitat connectivity areas, habitat areas, and nonhabitat into the foray model. These designations were used to modify the probability rings (e.g., compared to habitat areas, rams are 7 times less likely to be in habitat connectivity areas and 100 times less likely to be in nonhabitat).

- A herd's foray probability map will be overlain onto the allotments to calculate the risk that an animal will travel to the allotments.
- Summer forays were used for the model since that is when domestic sheep are grazing.
- Ewes will be analyzed separately but don't travel as far.
- The probability that an animal gets to an allotment is a combination of distance and habitat.
- The amount of risk isn't directly interpretable.
- Private grazing land will be included in the cumulative effects analysis.
- The model will be weighted for population size.
- The core herd home ranges have not been modified to exclude nonhabitat.
- The probability maps cannot be added together to calculate a sum for the entire population; however, they can be mathematically summed for the entire population.
- Where and how far a ram will foray depends on habitat connectivity.

C. O'Brien displayed a matrix of the number of rams per year per 100 rams that would foray to specific allotments. This matrix included only forays, not allotment contact, within the core herd home range, which is considered 100% probability of contact. Actual risk will vary depending on population size.

- The disease model will connect the core herd home range and foray models.
- The matrix becomes the risk of contact for the disease model.
- The models can be developed to present the likelihood of sheep presence anywhere on the Payette NF.
- UC Davis also analyzed trailing routes and areas of potential domestic sheep strays, which were drawn using professional judgment.
- The model could be modified to include risk from domestic sheep left on the landscape after the allotments are closed if the data were available.
- Josh O'Brien (UC Davis) will analyze how long bighorn sheep are foraging.

Hayman captured foray model comments on flipcharts (see Appendix 2).

Status of Disease Model

J. O'Brien displayed the disease model spreadsheets and preliminary results. The strategy was to model populations in the absence of disease to develop a carrying capacity—the stable size that each population would reach in the absence of disease—and then model outbreak effects.

- The minimum viable population size needs to be estimated to allow model to function.
- These simulations can be run for 1,000 years without a minimum viable population size and modelers could track how often the model dropped below a specified number of individuals.
- This model provides the probability of an outbreak and how many individuals would be lost (based on literature reviews from past outbreaks). This model does not include depressed recruitment following an outbreak and treats all individuals as adults.
- This is not a deterministic model but one that helps inform the decision.
- The model will be run with different probabilities of contacts (25, 50, 75, and 100) per year.

PREVIEW OF DAY 2 AND ADJOURN

Hayman reviewed the agenda for day 2 and the meeting adjourned at 4:30 PM.

DAY 2—AUGUST 19, 2009

MODEL FEEDBACK

Hayman reviewed the agenda and then collected model feedback from the team using a round-robin process:

- The new analysis has several significant advances, especially separating core herd home range from forays.
- The Salmon River population model portrays high risk in the Upper Salmon River and identifies areas where overlap occurs even without radio collars on the sheep.
- The foray model fits empirical data with professional experience.
- The inability of Payette NF decisions to be applied to other national forests and Bureau of Land Management land is a concern.
- Will the three models be combined and used to make management decisions?
- The foray model is good; the disease model has potential but needs more work, time, and data.
- The foray model creates a 35 km buffer zone that is being treated as an exclusion zone. The State of Idaho would not support this definition but would see this zone as a management area for domestic and bighorn sheep operations.
- Modelers should explore temporal (seasonal) movements when stray domestic sheep are still present.
- The model may not adequately incorporate risk beyond the 35 km boundary for herds on the outer boundary of the Hells Canyon population.
- The entire analysis and the role of the cooperators have changed from draft to final. Do the following foundational decisions still apply?
 1. We can't graze in occupied bighorn sheep habitat because it threatens bighorn sheep viability.
 2. No grazing in areas immediately adjacent to bighorn sheep habitat.
 3. We don't have a viable population in the Salmon River and need room for this population to recover.
 4. The risk of contact has to be near zero.
- The Geographic Population Range (GPR) was based on incidental sightings and the boundary extended to 100% (i.e., an inherent buffer was built in). How are these elements included in the new models?
- The Nez Perce Tribe agreed with the herd home range model.
- Incidental sightings should not be included in the foray model and the east side sightings should indicate occupied habitat that requires protection.
- The Regional Forester's designation of bighorn sheep as a sensitive species, which indicates the species is heading toward endangered status, should be incorporated into the models.
- The disease model does not reflect on-the-ground data.
- The model presentation and discussion were understandable, which will be important for the nonscientific readers.
- The habitat and foray models provide a sound basis for response should the Payette NF become involved in litigation.
- Sighting data are not being treated the same as radio collared data; however, all State agencies conduct surveys using protocol that is as scientifically rigorous as collar data.
- Documented data from past outbreaks suggest that any outbreak affects population viability.
- Hopefully, the Combined Team will gain the same confidence in the disease model as they have in the population and habitat models.

RISK ANALYSIS RESULTS FOR DRAFT SEIS ALTERNATIVES

C. O'Brien introduced the risk analysis for the draft SEIS alternatives. Based on the analysis, 14 rams are likely to leave the herd but will travel different directions and distances.

- The analyses will be refined with actual herd numbers.
- Hells Canyon data were used to develop the risk analysis.
- Modelers have not aggregated the risks at each band.
- Risks for each herd are additive.
- Results include contacts from forays not allotments that overlap the core home range, trailing routes, or domestic sheep strays.

Rainville received the following insights from individual cooperators regarding the risk analysis:

- The model should be conditioned with a sensitivity analysis.
- A 25 km maximum foray represents more observations and published data.
- Data could be pooled into distance groups.
- The seasonal cutoff in October could be arbitrary since stray domestic sheep remain on the Payette NF longer and many long-range movements by rams occur in fall.
- May need to develop a more robust model for domestic strays.
- Results from the 95% core home range and the foray model should be combined to create a new GPR.
- The analysis could be measured as number of contacts per alternative or acres, which would evenly spread the risk across the area and draw a line where domestic sheep grazing could not occur.
- The ID Team needs to decide how much risk is acceptable.

NEW ALTERNATIVE IDENTIFICATION

C. O'Brien displayed a preliminary alternative developed by the Payette NF that was a hybrid of Alternatives 7J and 7G and the foray model and used logical breaks such as watersheds, streams, ridges, and roads as boundaries.

- Rainville noted that the ID Team will have to develop a definition of occupied habitat.
- Domestic sheep stray potential will have to be changed for each alternative.

The Combined Team provided the following alternatives:

- Exclude all suitable bighorn sheep habitat within the foray model from domestic sheep grazing but do not fine tune the model using ridgelines.
- Use historical data as occupied habitat.
- Include a 100% core herd home range.
- Include the core herd home range plus a 15 or 20 km buffer.
- Include the 95% core herd home range and foray model but remove areas of nonhabitat, even within the core herd home range.

ASSUMPTIONS FOR DEVELOPING ALTERNATIVES

Rainville reviewed the responsibilities of the Payette NF and the Cooperators as outlined by the cooperating agency status memorandums of understanding and reminded participants that she is not looking for consensus; this is not an advisory group.

Soucek read the responsibilities of the Forest Service as stated in the appeal instructions from the Chief. There are comments from the domestic sheep industry that they are not "represented". Because this analysis has been designed to ensure bighorn sheep viability, more of the experts in bighorn sheep management have been involved; Cooperators were included because they are technical experts in their field which in this case

is bighorn sheep management. Soucek also reiterated the responsibility of the Payette NF to ensure bighorn sheep viability.

Rainville read the viability assumptions agreed to at the September 25, 2007, meeting:

Bighorn Sheep Populations

- 1) The Payette National Forest currently supports portions of two bighorn sheep metapopulations: the Hells Canyon metapopulation that is being recovered through transplant efforts and the native Salmon River metapopulation.
- 2) Each metapopulation is composed of a series of interconnected populations (herds).
- 3) Currently there is limited interchange between the Hells Canyon and Salmon River metapopulations.
- 4) It is anticipated that interchange between the two metapopulations will increase as risk(s) to viability are addressed and bighorn populations expand in number and range.
- 5) Bighorn sheep populations on the Payette National Forest are depressed and their continued viability is currently at risk.
- 6) Implementing management direction to ensure viability will likely result in increased bighorn sheep numbers and expanded range.

Bighorn Sheep Habitat

- 1) Bighorn sheep habitat is contiguous throughout the Payette National Forest; though not all of it is currently occupied.
- 2) Bighorn sheep habitat is contiguous throughout the Hells Canyon and Salmon River bighorn sheep metapopulations beyond the boundaries of the Payette National Forest.
- 3) Additional bighorn sheep habitat within and beyond the Payette National Forest is expected to be recolonized by bighorn sheep when risk(s) of disease transmission are addressed; rate of recolonization is unknown.
- 4) Domestic sheep allotments on the Payette National Forest contain or are in close proximity to bighorn sheep habitat.
- 5) Bighorn sheep habitat grazed by domestic sheep is no longer available source habitat for bighorn sheep because of the risk of contact and disease transmission.
- 6) Domestic sheep grazing precludes habitat availability for bighorn sheep beyond domestic sheep allotment boundaries (need buffers to assure separation).

Threats to Bighorn Sheep Viability

- 1) Disease transmission through contact with domestic sheep and goats is the primary risk to continued bighorn sheep viability within and beyond the Payette National Forest.
- 2) Contact between bighorn and domestic sheep occurs most often through grazing domestic sheep within or adjacent to occupied bighorn sheep range, straying domestic sheep during and outside of the grazing season, trailing domestic sheep on and off allotments through or in close proximity to occupied bighorn sheep range, and exploration of bighorn sheep.
- 3) Greater degrees of contact between bighorn sheep and domestic sheep or goats results in a higher likelihood of disease transmission.
- 4) On the Payette National Forest, a reduction in the probability of risk of contact does not equate to an equal reduction in the risk to population viability.
- 5) Even limited contact between bighorn and domestic sheep can result in a high risk to bighorn sheep viability due to disease transmission and prolonged population die-offs.
- 6) Risk to viability resulting from catastrophic losses (such as die-offs due to pneumonia epizootics) increases for smaller bighorn herds and depressed populations.
- 7) A disease outbreak in one herd has a high likelihood of spreading to other herds within the metapopulation; because connectivity is high within the Hells Canyon and Salmon River metapopulations.

Managing Threats to Viability

- 1) State, federal and tribal managers will exercise their authorities to prevent contact between bighorn sheep, and domestic sheep and goats in order to maintain viability.
- 2) Currently, the most effective means of preventing disease transmission stemming from contact with domestic sheep is through effective spatial (use of buffers) separation of bighorn and domestic sheep.
- 3) Management of risk to bighorn sheep herds and habitat within and beyond the Payette National Forest can affect viability of the larger regional metapopulations.

Rainville also quoted the following from the April 1, 2008 meeting summary (page 7):

The team discussed the definitions of the GPR and of a buffer. Although participants could not agree whether the GPR contained an actual buffer as defined by WAFWA, they did agree that the model contains a space that, at this time, provides a lot of separation in some areas and not enough separation in other areas.”

The USFS will proceed as follows:

- Use the term GPR, rather than occupied habitat, in all standards and guidelines
- Include a specific definition of GPR in the SEIS
- Be prepared to alter the GPR as new data are collected
- Soucek noted that between the draft and final, the USFS may be challenged as to how the GPR was developed and new lines may need to be drawn; however, the term GPR will always be used.

According to the draft SEIS, the GPR is defined as “A range in which a group larger than a herd but smaller than a metapopulation occupies or has occupied in the last 50 years.” This definition will be especially helpful as the ID Team defines occupied habitat.

NEXT STEPS

Process Next Steps

Based on the proposed deadline and remaining tasks, the Combined Team agreed to add another meeting in September to review the disease model and provide additional input. A meeting was also added in October. The timeline may need to be adjusted if the Payette NF receives additional data from the Idaho Department of Fish and Game.

Meeting Schedule

September 17 Videoconference (10:00 AM to 1:00 PM)—Review and discuss the next generation of the disease model. The following locations will be used: La Grande, Boise, McCall, Clarkston, Salmon River Ranger District, Davis, and Corvallis.

September 28 (half day) and 29 (full day) Meeting—Review effects analysis of draft alternatives, disease model, and definition of occupied habitat.

October 19 (half day) and 20 (full day) Meeting—Draft/review draft Forest Plan direction.

CLOSING REMARKS

Rainville appreciated everyone’s feedback and hoped that enough time had been added for additional feedback. The meeting adjourned at 2:15 PM.

CITED MATERIALS

USDA Forest Service. 2008. A Review of Disease Related Conflicts Between Domestic Sheep and Goats and Bighorn Sheep. Schommer, T.J. and M. Woolever, editors. USDA Forest Service, Washington Office, Washington, D.C.

USDA Forest Service. 2006a. Risk Analysis of Disease Transmission Between Domestic Sheep and Bighorn Sheep on the Payette National Forest. USDA Forest Service, Intermountain Region and Payette National Forest, McCall, Idaho.

USDA Forest Service. 2006b. Summary of the Science Panel Discussion. Available from the USDA Forest Service, Payette National Forest, McCall, Idaho.

HANDOUTS

1. Agenda, 1 p.
2. *Issue Resolution Strategy*, 100 p.

APPENDIX 1—AGENDA

Bighorn Sheep: Supplemental Analysis to the Forest Plan Environmental Impact Statement

Combined Team Meeting

August 18, 2009: 12:30 p.m. – 4:30 p.m.

August 19, 2009: 8:30 a.m. – 3:00 p.m.

Payette National Forest Supervisor's Office Conference Room

800 W. Lakeside, McCall, Idaho

Meeting Objectives:

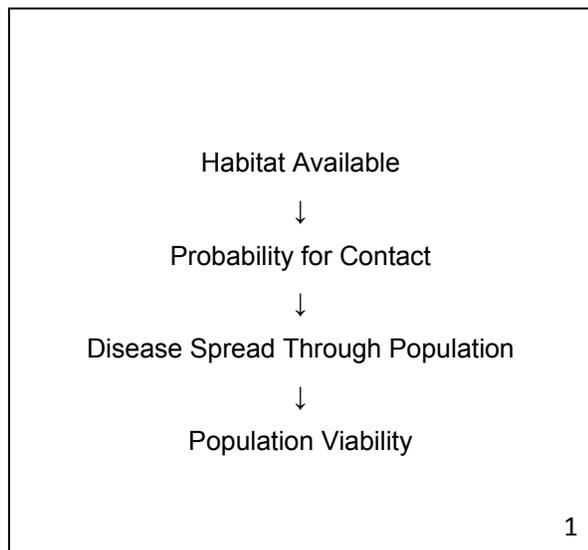
1. Receive a briefing on the core herd home range population and foray models, and an update on the disease model.
2. Review the results of the preliminary risk analysis for the alternatives presented in the draft EIS.
3. Discuss and identify other potential alternatives to develop and run through the risk analysis model.

Tuesday, August 18

| Time | Topic | Process / Product |
|--|--|----------------------------|
| 12:30 p.m. | Opening <ul style="list-style-type: none">• Welcome, introductions and opening remarks – Suzanne Rainville, Payette Forest Supervisor• Meeting overview, group agreements – Susan Hayman, Facilitator | Information |
| 12:45 p.m. | Process Update – Pattie Soucek, Payette National Forest Team Leader <ul style="list-style-type: none">• Issue resolution table• Other? | Information; Q&A |
| 1:00 p.m. (including 15 minute break) | Briefing on the Models – Chans O'Brien, Payette National Forest; Josh O'Brien, UC-Davis <ul style="list-style-type: none">• How models will be used for viability determination – Pattie• Core herd home range population model• Foray model• Status of disease model | Information; Q&A; Feedback |
| 4:30 p.m. | Preview of Day 2 and Adjourn – Pattie | |

| Time | Topic | Process / Product |
|---|--|-------------------------|
| 8:30 a.m. | Opening <ul style="list-style-type: none"> • Announcements – Suzanne, Pattie • Review of the Day 2 agenda – Susan | Information |
| 8:35 a.m. (includes 15 minute break) | Risk Analysis Results for Draft EIS Alternatives – Chans and Josh | Information; Q&A |
| 11:30 p.m. | Lunch (on your own) | |
| 1:00 p.m. | New Alternative Identification – Pattie To collect thoughts on any potential alternative management strategies or approaches to reduce risk, given the results of the modeling. | Discussion |
| 2:30 p.m. | Next Steps <ul style="list-style-type: none"> • Process next steps – Pattie • Review Action Items – Susan • Meeting Schedule – Susan <ul style="list-style-type: none"> ○ Dates ○ Objectives | Information; Discussion |
| 2:50 p.m. | Closing remarks – Suzanne Rainville | Information |
| 3:00 p.m. | Adjourn | |

APPENDIX 2—TRANSCRIBED FLIPCHARTS



Disease Model

*Start with a “healthy herd”

- 1) Assumptions about growth.
- 2) Assumptions about carrying capacity (not as an “upper limit” though).
- 3) Assumptions about minimum viable populations (may be questionable).
- 4) Simulations run for 1,000 years (can identify when populations drop below a variety of population numbers to test).
- 5) Model does not account for depressed recruitment. Currently all considered adults (should include this).

2

Disease Model

6) Currently fixed probability of outbreak—this will change once foray model info is used.

3

Foray Model

- 1) Foray model starts outside the home range.
- 2) Within the home range, 100% contact assumed.
- 3) Foray model based on summer (May–October) use only (because that is when domestic sheep are on the allotments).
- 4) Straight line buffer from home range → 35 km.

4

Foray Model (cont.)

- 5) In the matrix, the higher the number = the higher the risk of contact (based on 100 rams).
- 6) Sheep trailing routes buffered to 500 m.

5

Model Feedback

- 1) Analysis has advances:
 - Separates occupied range from foray
 - Particularly like how model portrays risk in Salmon River area.
 - Fits empirical data and experience (foray).
- 2) Concerned about expansion of Payette decision on other National Forests and BLM (should be applied to these).
- 3) When we talk about 3 models, will they all stand alone or be combined for Suzanne’s analysis?

6

Model Feedback (cont.)

- 4) Like work done on foray model.
- 5) Potential still for disease model; needs more work and time → more data needed.
- 6) Concern is with foray model range → 35 km “buffer zone” → shouldn’t be an “exclusion” zone; takes up too much area (inside and outside the Payette National Forest). The State of Idaho wouldn’t support that.

7

Model Feedback (cont.)

- 7) Foray and home range good.
 - How about exploring temporal/seasonal break (summer/winter)?
- 8) Are any herds on the outer boundary of Hells Canyon on the outer border of 35 km foray model? Model may not incorporate risk adequately (beyond that point) in these cases.
- 9) Changing entire analysis—lots of moving parts. Have foundation decisions changed?

8

Model Feedback (cont.)

- 9) Continued
 - Can’t have domestic grazing in occupied BHS habitat—threat across entire Forest.
 - No grazing in areas immediately adjacent to occupied BHS habitat.
 - Need room for Salmon River population recovery (not viable now).
 - Risk of contact must be near zero.
- 10) GPR based on telemetry, sighting, protection against straying, inherent buffer. How are these being addressed in models?

9

Model Feedback (cont.)

- 11) 95% HR model looks good.
- 12) Not sure incidental sightings adequately treated in foray model (Allison-Berg example).
 - Ease side sightings (2 years running) should indicate occupied habitat that is currently not being addressed. Need protection around these sighting areas.
- 13) More work to do on data/estimates for disease model. Do we have enough time? Agree with “test and see” approach.

10

Model Feedback (cont.)

- 14) Ensure models address that RF has designated BHS sensitive spp.
 - Completely analyze effects on sensitive species.
- 15) Do models reflect data on the ground? Home range and foray seem to...disease model not there yet. DM has to reflect different examples of herd population dynamics that we’ve seen.
- 16) Model presentation and discussion helpful and understood. Will be important for future understanding with public.

11

Model Feedback (cont.)

- 17) Habitat and foray models provide sound basis for FS response.
- 18) Sounds like more info needed for DM.
- 19) 2-step process: home range and outer boundary. Need to combine when describing to public as “BH use area.” Terminology is important—don’t say “buffer”—implies sheep not there when they are. “Topography of Risk.”

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Model Feedback (cont.)

- 20) Sighting data includes aerial and field surveys. Just as rigorous as collared data and should be included.
- 21) Rethink DM in terms of "any outbreak is not viable." Model prevalence of disease as it spreads across the landscape. Scientific and defensible.
- 22) Have reached confidence with population and foray models over time. Hope to reach same level of comfort with disease model. Will keep working with Tim for answers.

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Risk Analysis

- 1) Assess all pieces of allots outside of the alternatives.
- 2) Assess risk of contact by herd.

For model...

- 3) Home range being treated as "a herd"—100 rams/animals.
 - 14 leave
 - Question is where they go.
- 4) Used all data to develop model.

14

Risk Analysis (cont.)

- 5) Amount of risk on the Forest can be additive from all herds.

15

DEIS Alternatives

- 7G = Preferred (GPR)
- 7H = GPR + 9 mile buffer
- 7J = Watershed lines
- 7K = Current AOIs
- 3.4.6 = No grazing in Hells Canyon
- 1B.2.5.7 = DMS across Forest

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Risk Analysis Q&C

- 1) How do the alternatives compare if evaluated against Keith's 4 criteria? (morning notes)
- 2) Seems conservative estimate → as time goes on, risk will increase as probability increases over time. Is this really additive?
- 3) Do we want to be this sophisticated given the data we have? And its variability?

17

Risk Analysis Q&C (cont.)

- 4) Could draw a new "GPR" line using 95% and foray model.
- 5) Need ability to assess both risk of contact and risk of disease transmission.
- 6) Need to do a sensitivity analysis.
- 7) Cutoff (seasonal) of end of October could result in not capturing the long range movements associated with the breeding season.
 - Maybe should combine summer and winter when assessing risk.

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Risk Analysis Q&C (cont.)

- 8) May need to develop a more robust model/assumptions for domestic strays.
- 9) Do we want a measure of distance/contacts (table), or do we want a line across the area? Essentially...should we take the 95% HR model and results of the foray model to create new GPRs to be used in presentation in the FEIS?

19

Risk Analysis Q&C (cont.)

- 10) What areas are we considering occupied, where there may be no DMS grazing?
- 11) Need to display analysis that shows how risk varies by alternative and how it compares to the current situation. Need to determine how much risk is acceptable.

20

Potential New Alternative

- 1) Use natural breaks, roads, ridges, streams to draw new line.
- 2) Risk includes habitat, foray, HHR
- 3) Hybrid of J&G and what went into new foray analysis.
- 4) Drawing line by color/by risk.

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Potential New Alternative Feedback

- 1) Grazing right up to "blue lines" might be in conflict with provision not to graze next to occupied habitat.
- 2) Consider HHR + foray = occupied habitat or
- 3) Just work with HHR and foray. Do not describe as "occupied habitat." Use adaptive management to manage risk.
- 4) Use "risk threshold" previously identified to draw the line (or whatever that number should be).

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Potential New Alternative Feedback

- 5) Looking at half of data set. Need to look at risk of straying domestic sheep.
- 6) "Straying" area needs to be redrawn by alternative.
- 7) All suitable habitat within foray model = no grazing → another option that is repeatable and not "mucked up" with judgments about topographic features, etc.
- 8) McGraw—Use historical data on occupied habitat to provide room to grow in the future/recovery. Don't have "blue line" run through the middle of McGraw 95%.

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Potential New Alternative Feedback

- 9) How certain are we that the removal of domestic sheep will result in BHS recovery?
- 10) Other suggestions:
 - Use 95% line.
 - Core HR + 15 km buffer.
 - Core HR + 20 km buffer.
 - 11) How about when 95% line crosses unsuitable BHS habitat?
 - Could remove as an option.
 - Still include foray model.

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Process next steps

- What is the team's opportunity for input?
- Are basic assumptions still valid (see Keith's/Paul's)

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Assumptions

October 1, 2007

- 1) Look at a system.
- 2) There will be strays.
- 3) Will do a cumulative effects analysis.
- 4) HC & SR each connected—limited interactions at this time but expected to grow.
- 5) Where BHS & DM when BHS habitat overlaid by DMS, BHS habitat not available (not a bright line).
- 6) Even limited contact increases risk.

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Looking Ahead

September 28 (half)/29 (whole)

Objectives (provide feedback):

- 1) To review effects analysis of draft alternatives (may collect feedback).
- 2) Review disease model.
- 3) Review and discuss occupied habitat.

October: Discuss/review draft FP direction.

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September video conference to review the next iteration of the disease model → collect feedback.

- September 17, 10am—1pm MDT
- La Grande, Boise National Forest, McCall, Davis, Clarkston, Corvallis, Salmon River RD

October 19–20

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Follow Up/Bin

- 1) Database training sessions?
- 2) If you feel something is still missing from the content analysis/issue resolution table, please email Pattie. 8/26
- 3) Does analysis yield a probability on any given point on the map? Yes (done).
- 4) Data set of counts and disease events by game management unit or herd for Rocky Mountain or California bighorn sheep → Paul Craig to Josh. 8/28
- 5) Josh will assess the data UCD has, what is needed, and make any specific requests to State. 8/28

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Follow Up/Bin

- 6) Josh to provide "plain English" version of model (table) to combined team. 9/4
- 7) FS needs to resolve the definition of "occupied habitat" (with team input). September meeting

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