Note from the Chair, Erica Freese

It is April here in Nevada and the last week has given us some much needed snow, some not so wanted wind, and a lot of sunshine. Spring is finally here and the trees are blooming and flowers are showing their colors, even if we haven’t had much moisture and the forecast is looking rather parched. Field season has already started for some of us, and just around the corner for others. Like many of you, field season is my favorite time of the year – less time in the office and much less time in front of the computer! However, it seems the last few months have flown by and not quite enough has been accomplished. SRM and the WHC had an excellent showing and meeting in Spokane, WA this winter. For those of you who were unable to attend, the WHC spent much of its meeting discussing the need for position statements. The general consensus was that SRM’s position should always be to use the best available science when addressing everything from grazing management issues to single-species issues like salmon, sage-grouse, or wind energy development. However, the WHC will continue to provide updates, revisions, and comments to SRM’s position statements.

Following some action items from the January meeting, I would like to thank all of our members that provided comments for our letter responding to the BLM-USFS EIS scoping period for sage-grouse. Our letter was well received by the SRM board members and made its way to BLM’s Director, Bob Abbey, within days of completion. WHC will continue to follow the sage-grouse EIS process and provide comments, if and when necessary.

The WHC sponsored symposia were well received and well attended at the 2012 meeting in Spokane. WHC members also had some great ideas for symposia lined up for the 2013 Oklahoma City meeting, so hopefully those proposals were submitted by May 7.

Hope you all have a great field season! Feel free to email me with ideas or happenings that you feel WHC should be apprised of or provide input on.

Great Plains Fire Science Exchange Ignites Excitement About Fire Science

By Sherry Leis
Consortium Coordinator and Fire Ecologist

Finding information or colleagues to assist with projects or idea development can be difficult when the professional community is small and widely dispersed. The Great Plains Fire Science Exchange (GPFS) plans to assist landowners, managers, practitioners, and researchers by building a more cohesive fire community in the region. GPFS is part of a national effort by the Joint Fire Science Program (JFSP) to more effectively disseminate fire science [http://www.firescience.gov/JFSP_consortia.cfm]. Although the program is funded on two year cycles, the intent is for the consortia network to be a long term investment.

The regional consortia are charged with evaluating fire information needs within their regions and reporting that back to JFSP, a grant funding source. GPFS plans to strengthen the feedback loops between researchers and managers so
that both benefit. Managers receive information in formats that enhance their ability to make sound decisions while helping researchers to better understand the information needs of the field. With the funding source also part of this process, we are hopeful that the result will be innovative, applicable research, and improved land management.

GPFS is unique among the consortia because of differences in landownership. In the Great Plains, vast tracks of land are being managed by private landowners rather than state and federal agencies. These private lands have tremendous opportunities for conservation on a regional scale and many ranchers or producers have a strong land ethic and aim to be good stewards of the land. In order to be most effective, GPFS are planning strategies to provide opportunities for these folks to learn more about the benefits of fire, operations techniques, and more. We plan to reach out to NGOs like Pheasants Forever as well as extension people who work with landowners and support them in their efforts.

The consortia are directed to be inclusive, serve as neutral science partners, be customer driven, operate collaboratively, be innovative, and facilitate the flow of fire science information and needs. The GPSE plans to do this in several ways. Currently, our web presence consists of a Facebook page http://www.facebook.com/GPFireScience, but a website is in development. We plan to develop science syntheses, webinars on regional issues, build a network of demonstration sites, and provide updates on new science in the region at meetings. We are currently planning two events at the 2013 SRM meeting in Oklahoma City. For more information or to join the contact list for the consortium, send an email to GPFire-Science@missouristate.edu. Eastern Tallgrass Prairie and Oak Savanna Consortium or please contact Paul Zedler, phzedler@wisc.edu, (608-265-8018)

Elk habitat selection in western Oregon and Washington: Models for a new century

Submitted By Marty Vavra

(Submitted prepared by Rachel White, USFS PNW Research Station)

Elk have multi-million dollar effects on recreation and land management - the public spends millions of dollars on hunting and viewing these iconic animals, and agencies and private landowners contribute substantial sums to improve elk habitat. But management of elk in the Pacific Northwest, including direction in Forest Service and Bureau of Land Management planning documents, has relied on outdated guidelines for elk habitat. Earlier management strategies focused heavily on minimizing human disturbance (like traffic on roads), but failed to address the limiting effects of specific habitat elements, especially those related to nutrition. The last two decades have seen a wealth of emerging research addressing factors such as the nutritional adequacy of elk habitat, particularly in the summer, as well as reaffirming the effects of human disturbance on elk.

A new habitat selection model, in conjunction with an elk nutrition model, has been developed that incorporates this updated research and provides a foundation for setting future management direction and habitat restoration for elk in landscapes of western Oregon and Washington.

These models focus on the summer range of elk, which is a biologically critical time for elk productivity. The models are suitable for application across large regional landscapes that cross multiple ownerships and include multiple elk populations. This big-picture approach is designed to help landowners work strategically to integrate management objectives and habitat treatments for elk across ownerships.

In partnership with land managers and biologists from Forest Service, Bureau of Land Management, and tribal ceded lands in the Pacific Northwest, these models were beta-tested with data from a suite of “real life” management scenarios. This allowed the modeling team to gain users’ perspectives and obtain constructive feedback. Extensive review and comments from potential users gave the modelers a better understanding of how the models will be applied at a district or regional office level.

New elk habitat selection and nutrition models are ideal for helping plan and coordinate
Forest Service, tribal, state, and local management efforts to address elk habitat. They work across ownerships, and are particularly useful for large projects, forest plan revisions, and resource management plans.

What have we learned about elk populations and habitat?
- The needs of elk are compatible with active silvicultural management and wildfire. However, although elk benefit substantially from a variety of management practices that reduce overstory cover, use of the resulting forage base depends on availability of nearby cover and managing human disturbance, for example through seasonal road closures.
- In general, the lower the canopy closure and the higher the elevation, the greater the abundance of high quality forage species and dietary digestible energy (DDE). Digestible protein also tends to follow this pattern.
- DDE relates directly to animal performance. Herds with summer deficiencies in DDE may have low body fat and reduced pregnancy rates.
- Nutritional resources for elk are relatively poor in the Coast Range and many areas in the Cascades. Even with clearcuts, forage quality is often below maintenance level during summer for lactating elk in these areas.
- During summer in western Oregon and Washington, elk select gentle slopes close to cover-forage edges, but away from open roads; consideration of these preferences in planning management activities on public and private lands that support elk is necessary to maximize benefits to elk.
- The models are explicitly designed to evaluate summer range conditions because this is the time that substantially affects year-round animal performance. For example, summer range conditions directly affect growth of juveniles and subadults, pregnancy rates, and body fat levels of elk entering winter. Consequently, evaluation and management of summer range conditions is considered essential to year-round management of healthy elk herds.

"Elk really do know what they're doing out there on the landscape," says model developer Mike Wisdom. "If they're not spending time in the most nutritionally dense areas, they're very close to those areas.”

What does the habitat model require?
The team found that the model that performed best in validation tests was based on four habitat covariates:
- distance to open public road
- dietary digestible energy (DDE)
- distance to cover-forage edge
- slope

What can the habitat model do?
The habitat model actually consists of two main components - a nutrition “submodel” that ranks areas across landscapes according to their nutritional value for foraging elk, and a habitat selection model that incorporates nutrition with other covariates to rank areas according to the predicted level of use by elk.
- The habitat model characterizes elk use patterns across landscapes. It can help set goals for changing elk use in certain areas, and help assess how to get more “bang for your buck” with management prescriptions. It can also show the consequences of NOT improving habitat.
- Because the model is designed for large landscapes, it facilitates an “all lands” approach that can
help encourage and inform dialogue among different ownerships and agencies.

- Users can compare different management scenarios. For example, using the Forest Vegetation Simulator, users could remove canopy cover in units across a management landscape and then estimate dietary digestible energy (DDE) at specific time intervals to make predictions of elk use. If management speeds up or retards vegetation succession, the model will reflect that.

An analysis on the Mt. Baker-Snoqualmie National Forest helped the Muckleshoot Indian Tribe evaluate alternative management scenarios to benefit tribal treaty resources. This map shows the predicted level of elk use on the study area under existing conditions.

“The model presents a picture of the average behavior of the average elk across a whole region,” explains model developer Ryan Nielson.

### Frequently Asked Questions

**What is the minimum-sized area for model application?**
The habitat model is designed for application at the same spatial extents at which it was developed and validated. In general, the minimum size of area is approximately 25,000 acres (10,000 hectares). However, the nutrition submodel can be used to evaluate nutritional adequacy of smaller areas.

**Can these models be used for winter habitat? Movement corridors? Hunting seasons?**
No. The telemetry data used to fit the models were filtered for summer (June – August) months only, when the females are trying to put on body fat—a key component of overall productivity. These models may not be accurate in the hunting season, or for spring or winter seasons.

**Can the models be used in southwest Oregon?**
Not yet. Differences in vegetation and nutritional conditions between southwest Oregon and further north may be substantial. But the team collected new vegetation and elk nutritional data in 2011 and is now developing a new nutrition model for SW Oregon that can be incorporated into the full habitat selection model.

**If we want to draw elk away from private land, what forage species should we reintroduce?**
Forage selection data from elk grazing experiments can help identify which species to avoid and which are palatable to elk. The model, however, relies on groups of species, not individual species, based on their palatability.

**What if active management for elk is not feasible because you have spotted owl habitat?**
Management of public lands has become a complex balance between sometimes competing demands. Regardless of the management objectives on a given piece of forest, this model can still provide information about impacts of different land uses on elk populations and help practitioners weigh possible alternatives. As one land manager said, “Having these nutrition maps could really help us from an administrative standpoint because they justify creating openings.” Even if forest canopy cover cannot be manipulated, targeted road management can still improve elk habitat quality.

**Can fire regime considerations be added to the model?**
The model is “static” in that it evaluates landscape conditions for a given point in time. However, any landscape conditions can be simulated based on fire or other disturbance regimes, with the use of a variety of commonly available software packages (e.g., VDDT models). Projections from these landscape simulation models can then be used to evaluate future habitat conditions for elk, by using results from the simulations as covariates in the elk habitat model.

**Is managing road access still a good idea?**
Yes. For elk to fully benefit from knowledge gained through the modeling process about elk habitat choices, active road management is necessary, and can offer benefits when changes in forest cover to
benefit elk are infeasible.

**Can this model capture the impact of treatments on local habitat quality?**

No. The model works at a broader scale than most individual treatments on public land. For example, the model resolution would not capture the impact of management prescriptions such as variable density thinning (“skips and gaps”) implemented on 1/2-acre plots. What the model can be helpful for is laying out landscape-scale habitat enhancement scenarios such as determining what general areas would yield the most promising results from silviculture activities or road and trail management. Another value of the model is that it can make explicit the negative consequences of certain management constraints on elk habitat.

**Do model results mean we should not manage for elk habitat in the Coast Range?**

The regional model shows consistently poor nutritional conditions for elk in the Coast Range, and body fat measurements and pregnancy rates back this up. The nutritional needs of lactating elk in summer may not be fully met in the Coast Range, even with forest management activities. Nonetheless, early seral habitats are much better for elk than large tracts of closed-canopy coniferous forests. All in all, our data clearly indicate that improvements through active management should benefit elk, even in the Coast Range.

**What is the definition of forage area, as used in the distance-to-edge calculations?**

In the habitat model, stands with trees less than 2 meters tall and canopy cover less than 40 percent are considered “forage” areas. If this threshold were lower, areas defined as forage would be substantially more short-lived. For example, many areas in western Oregon and Washington achieve overstory canopy cover of more than 20 percent within five years of timber harvest. Our analyses suggest that elk are responding to a cover-forage edge defined by the 40 percent canopy cover threshold.

**Information products available:**
Maps
GIS files
Peer-reviewed publications
User guide (USFS General Technical Report)

**Find out more:**
The models are available for use by interested parties; a Users’ Manual is near completion. Please visit our project website to stay informed: [http://www.fs.fed.us/pnw/calendar/workshop/elk/](http://www.fs.fed.us/pnw/calendar/workshop/elk/)

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markfreese@ndow.org

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