



GENERAL MEETING MINUTES JUNE 9, 2010

1. Introduction

Meeting called to order at 6:40 p.m. with the Pledge of Allegiance, USVEMG President David Willson presiding. The minutes of the May 2010 meeting were circulated in advance. Don Hacherl motioned to approve the minutes, Harold Erland seconded the motion. The May 2010 minutes were approved with a unanimous vote from the full membership.

2. GIS Data Analysis Presentation by Russell Link and Andy Duff, DFW

Russell Link, district biologist Region 4, Department of Fish and Wildlife (DFW), congratulated the group on keeping the elk management group functioning. The North Rainier Elk Management Plan ("the Plan") is due at the end of 2010. The Plan covers the region including the watersheds of the White, Green, Cedar, and Snoqualmie Rivers, and a few other minor watersheds. Management of elk populations in this region is driven using the Plan. The Muckleshoot Indian Tribe is on board providing assistance for the White, Green, and Cedar River watersheds. The USVEMG will be assisting with data collected over the last few years for part of the Snoqualmie watershed. Also providing assistance from farther south colleague Michelle Tirhi, urban biologist South Puget Sound Region, DFW.

Mr. Link proposed to meet with Mr. Erland in July to start putting together a plan for what we want to include in that update. The Plan is a formal document looked at by a lot of people. The goal is to make this something more than something a hunter would look for a good place to hunt. It will include information for urban planners. Both Mike McCarty, senior planner, City of North Bend, and Jeff Azerrad, Priority Habitat and Species Biologist, DFW, are assisting with the Plan update.

The Plan update has five year objectives. In our discussion we will ask "What do we want to accomplish in the Snoqualmie Valley?" Some objectives are education, watchable wildlife program, and the number of elk. The other component of the plan is the strategy to achieve the goals that are set.

Russell presented the group with a box of the 2010 Hunting Regulation pamphlets, navy blue volunteer hats, and four copies of his book, "Living with Wildlife in the Pacific Northwest" (ISBN 0-295-98386-8). He also mentioned \$500 is being made available to aid the population study.

Mr. Link introduced Andy Duff, Westside Regional Information Specialist, DFW.

Mr. Duff thanked the group for providing summary data sets and provided a number of printed copies of the draft GIS analysis work for the elk group's study. He presented a slide show presentation to the group titled "Incorporating Community-Based Collaboration and Urban Corridor Suitability Models." The presentation discusses a West-side elk habitat modeling workshop he attended April 2010 in Corvallis, Oregon, reviews his draft model results considering variables that went into the map, how he combined the variables to make a suitability model, and how the suitability model was used to produce a commuting and dispersal corridor analysis.

The data sources for the analysis include are:

- a. VHF telemetry adjusted or filtered to 1/8 mile accuracy from May 2008 through May 2010.
- b. GPS telemetry information collected more at more frequent (daily) intervals from April to May 2010.
- c. Community-based mapping results by parcel. Small green dots representing parcels where individuals have seen one to six elk, larger green dots where individuals have seen up to twelve elk, large dots where individuals have seen more than twelve elk.
- d. Dark green dots representing the location where individuals have reported elk and total group counts using the 1-800-ELK-HERD number.
- e. Carcass collision information from the Department of Transportation (DOT) along I-90 with 1/10 mile granularity (accuracy $\pm 1/2$ mile). Information from 2009, courtesy of Mr. Kelly McAllister, was provided as draft information and only represents the site of a collision.
- f. Vehicular collision information from the DOT for King County. Information from 2009 was provided as draft information and only represents the site of a collision.
- g. GPS location of carcasses reported by the USVEMG, more accurate, $\pm 1/2$ meters.
- h. Evidence from monitoring cameras placed along I-90 at the mile 31 South Fork Snoqualmie River crossing, the Snoqualmie River Trail crossing, and near Exit 34 (Truck Town).

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Habitat Modeling Workshop

In April 2010, Mr. Duff attended the "Elk Habitat Selection in Western Oregon & Washington: Models for a New Century" workshop in Corvallis, Oregon, <http://www.fs.fed.us/pnw/calendar/workshop/elk>. He referenced a 1986 publication for Western Oregon written by Michael Wisdom which presented a series of models which showed how to predict elk habitat based on GIS variables that were available. 25 years later at the workshop the original models were updated with the newer resource selection function approach using multivariate statistical modeling. The 2010 modeling group started with a list of forty variables and narrowed the list to fifteen that were easiest for biologists and land managers to work with. In the draft output of the model selection process, four key variables were presented that can be used to qualify elk habitat in Western Washington and Western Oregon.

1. Mean dietary digestible energy (DDE).
2. Distance from the nearest road open to public motorized use.
3. Distance to nearest cover/forage edge.
4. Mean percent slope.

This model is mainly driven by resource lands (National Park Service, U.S. Forest Service, state lands, commercial timberlands, and tribal lands) and primarily hunted populations. Andy didn't see a strong pattern regarding distance from the nearest road, so in the preliminary North Bend model road density was substituted for distance to nearest road.

Andy received draft GIS data layers for the North Bend area from the United States Forest Service (USFS) Pacific Northwest Research Station in La Grande, Oregon, the folks responsible for the 2010 Elk Modeling Workshop. These data sets included:

- a. Cover/forage and distance to nearest cover/forest edge.
- b. Dietary Digestible Energy (DDE) estimates.
- c. Habitat effectiveness for size and spacing of forage and cover.
- d. DDE values for ecological system life from agricultural classes, for crops in the GNN data.
- e. Equations and background information for predicting dietary digestible energy and accepted biomass.

There are some areas (primarily medium and high intensity developed areas) where DDE information is missing for the North Bend study area. With the DDE values and equations provided by the research station, we could visually survey these areas to ground truth and update the DDE data set to account for areas where elk are travelling and foraging in non-natural areas (e.g., lawns). Additionally, agricultural types could be examined in more detail and updated in the predicted DDE maps.

In the last ten years (human) population has exploded in this area. To be able to plan for that, we need to understand how the elk are using the habitat here in town, how they are moving through the landscape, and patterns. This model will be used to plan for urban growth, minimize public safety risks, minimize vehicle collisions, minimize damage to public/private property, as well as the objectives set forth in the Plan.

Weighted Variables used to Produce Habitat Suitability

The five major variables in this analysis are weighted by relative importance, as interpreted from the elk modeling workshop and patterns prevalent in the USVEMG elk use data. DDE is 50% of the model and represents energy of the feed less fecal energy coming out. Distance to nearest forest edge is given 20% weighting. According to the 1986 publication, "Maximum intake and least expenditure of energy occurs when forage and cover are of appropriate size and in proximity." It means if elk is foraging, it needs to get to cover quickly. Mean percent slope is given 10% weighting. Travel through, or use, could be restricted by various steep slopes. Road density is ranked with 10% weighting. Mr. Duff noted that he did see a statistical pattern when reviewing the values of road density in conjunction with elk use data rolled up to a parcel level. He observed that the East parcels were an area of fewer roads, used more frequently than areas with more roads. Distance to the main stem of the South Fork and Middle Fork Snoqualmie River is weighted 10%. There is a pattern in the elk use data with respect to rivers. They are using these rivers and they are commuting near them and many other animals use these as natural corridors for travel or hunting prey.

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Dietary Digestible Energy (DDE)

Regarding DDE, John and Rachel Cook, National Council for Air and Stream Improvement, conducted an experiment to evaluate the effects of summer-autumn nutrition on reproduction and survival of elk on The Westside. The study fed tame animals natural vegetation with different levels of DDE (high, intermediate, and low quality feeds) in summer and monitored animal performance through the following spring. The draft cutoff presented at the Westside workshop which distinguished between good and marginal nutrition (DDE) classes and corresponded to a DDE value of 2.7 kcal/gram. This Westside cutoff is unpublished and is working its way through peer review at this time.

Another table was a study of private timberland near La Grande, Oregon, from the Cook et al. 2004 Wildlife Monograph. A table of estimated levels of performance expected for elk in temperate ecosystems as a function of dietary digestible energy (DDE) from mid-summer through mid-autumn shows correlation to calf cow mass, pregnancy rates with respect to quality of DDE. The published value of DDE shown to distinguish between marginal and good nutrition was 2.75 kcal/gram in this study.

The DDE map for North Bend highlights areas exceeding the "2.7" threshold which is represented on the map as a purple or blue polygons.

Distance to the Edge

For this analysis, cover is defined as more than 40% canopy cover, trees higher than 2 meters, (e.g., tall trees with lots of closure). Everything else is defined as forage. The boundary between the two is the edge. Once the edge is located, distance to the edge can be calculated.

Mean Slope Percent

The source for this content is Light Detection and Ranging (LiDAR) elevation surveys. The original resolution of the LiDAR data was 6 by 6 feet cells. However, because elk are not going to be responding to this fine of a scale, the LiDAR data was resample to 30 by 30 meter cells, and then smoothed to represent the mean slope value within a 350 meter radius around each 30 by 30 meter raster cell.

Distance to the River

Simply the straight line distance to the Middle Fork Snoqualmie River or the South Fork Snoqualmie River.

Road Density

The source line work for this information is a 2009 U.S. Census Bureau roads data set filtered for those roads that receive public motorized use (primary, secondary, and local roads only).

How the map was put together

The technique is "Standard GIS Suitability-based Mapping," similar to U.S. Fish and Wildlife Service habitat suitability indexes. These steps are followed:

1. Define GIS data layers which represent habitat features important to elk.
2. Think about and document how the species responds to these variables (spaces/environment relationships) as published in the scientific literature.
3. Apply these published species/environment relationships to the mapped GIS data to produce a habitat suitability surface.
4. Use elk use data to verify model results.

Editorial note by Andy Duff, June 30, 2010: The model has been adjusted for our understanding of what's happening in the urban environment versus a more remote area. More work and research needs to go into this to ensure the urban environment is represented properly in this model.

Discussion:

What about other water corridors?

Mr. Duff: At the workshop they didn't include water. There's probably something happening south of Exit 34.

Question 1: Is it a function of water or a function of cover?

Mr. Duff: Probably it is a function of cover/navigation.

Mr. Erland: We've got water everywhere.

Mr. Duff: I need to know if water is a mapping layer to drop or revise.

Mr. Willson: Perhaps add Boxley Creek.

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Question 2: Where on the ground do you grade quality of DDE?

Mr. Duff: Percent of hardwood in the canopy, canopy cover, potential natural vegetation zones, formulas developed for monitoring elk in their habitat, characteristics of landscape. More specific technical information is available upon request. In a nutshell, the Landscape Ecology, Modeling, Mapping and Analysis Group (LEMMA) from Oregon State University has produced a Gradient Nearest Neighbor (GNN) map data set which predicts individual tree species composition as well as the key cover, stand height, and hardwood composition variables used in predicting DDE. The GNN dataset was the basis for applying the Cooks DDE and accepted biomass formulas to produce the maps used in the North Bend suitability analysis.

Question 3: Is there predator data which might factor into elk distribution?

Mr. Duff: I can check with the department to see if it is available.

Question 4: Where there are more people, there are probably more reports of elk. How do you account for this?

Mr. Duff: This is balanced out by the other mapping layers to the best of our ability.

Question 5: There's a lot of telemetry data in the vicinity of Edgewick Road. How do you account for telemetry readings?

Mr. Duff: Models should be formed individually per animal. Each collared animal is assigned a coefficient. Only then can telemetry data be combined.

Brian Kertson, Wildlife Science Group, UW: The best way to take care of an unbalanced data set is to develop an individual model for each animal, then average the metric coefficients per animal (the forage, the road density, the proximity to edge), then average the coefficients across all the animals to develop a measure of error for each coefficient.

Mr. Duff: The only data set we have which should support analysis like that would be the GPS telemetry data that we are just beginning to collect.

Mr. Kertson: Yes, ideally that is what you should be using.

Mr. Duff: Models presented in Oregon were based on high quality GPS telemetry data in Western Washington and Western Oregon.

Mr. Kertson: Only thing about this is that they didn't do is develop these models for residential – or what North Bend and Snoqualmie is; on the boundary of the wildland/urban interface. Perhaps substitute road density with residential density. I've built a model for cougars in this same area.

Quantifying where Corridors are in the Landscape

The exercise is to understand where elk are moving through the landscape and help plan for growth. It is to locate commuting and dispersal corridors, not migration corridors. Regarding landscape/connectivity planning and corridor design, when you look at designing corridors around town you should think about high bio-diversity areas, you should use a multi-species focal approach. Don't just think about elk in the landscape. The reason is not to hurt something else trying to solve one problem.

The Circuitscape Program

The software uses the analogy of conductivity to predict areas where animals may move through the landscape with least resistance. The strategy is to identify a number of high quality habitat areas "nodes" (large, > 10 acres in size, and having good and excellent nutrition classes) and calculate "conductivity" between these nodes. A function in the ArcGIS software has a cost/distance estimate which was used to help constrain the area (extent) in which the Circuitscape analysis would be run. In the analysis, Mr. Duff selected 92 focal nodes and by using the habitat suitability surface as landscape conductivity produced a current map. Areas of high current show more permeable areas to animal movement and low current areas are less permeable for movement. He noted that it took the computer 25 hours to complete the current calculation for this area.

Additional Questions:

Mr. Hacherl: Does this account for slope? It seems that some "high current" areas are on cliffs.

Mr. Duff: Slope may have been underweighted in producing the suitability surface. There are several ways to adjust the variables in the suitability model or just exclude some regions in the next run.

Mr. Cassidy: Is the distance between two points in this calculation "as the crow flies" or is it "up and over?"

Mr. Duff: It would be the Euclidean distance in combination with the cost. Perhaps the distance could be modified to account for actual surface distances.

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Mrs. Willson: At what point can we use this model as a reference for forming policy?

Mr. Duff: More GPS data will help build confidence in the model. We won't be able to produce parcel granularity recommendation; this analysis is at a much coarser scale. A statistical, animal-based model using GPS data as Brian Kerston suggests may be better suited for this purpose because it can provide measures of model uncertainty.

Mr. Willson: Can we use this data to project ideal wildlife corridor locations?

Mr. Duff: I think we can get to those kinds of recommendations. Some swaths of land can be considered. To increase the value of some of these maps, it would be a good idea to take a field trip to some of these locations and see if animals are already using those corridors or not.

Mr. Willson: Are there other places like Sequim where we might review tracking information and corridor analysis already conducted?

Mr. Duff: We can discuss this with the biologist from over there. I don't think that they've done corridor modeling to the degree that we've done here, but they probably have radio telemetry data. There's not a lot of information out there on urban elk like this.

What's next?

Andy is seeking feedback from the group on how we might make this better. The focus should be on the GPS data. There might be value in another attempt to place cameras and update values of missing DDE areas in the valley.

3. Plaque presented to Russell Link

On behalf of a grateful elk group membership, Mr. Willson presented a plaque to Mr. Link as co-founder and inspirational leader of the Upper Snoqualmie Valley Elk Management Group.

4. People and Land Management (PLM) Committee Report by Maura Callahan, Committee Chair

Mike McCarty reported a "no" vote from the city council regarding wildlife corridor width and stressed the dual interest in preparing a new proposal substantially different than the current proposal and to stress multiple species use. Master Hunter Permit Program volunteers are making progress on the fence repair along I-90. North Bend public works is fully occupied by the sewer construction project for the short term. The speed study on SR 202 has been referred to North Bend mayor Ken Hearing for follow up. Short term goals for the committee will be among the agenda items at the next meeting 1:30 p.m. Tuesday, July 6, at the North Bend City Hall Annex on Fourth Street across the street from the library.

5. Elk Research and Management (ERM) Committee Report by Harold Erland, Committee Chair

Currently, new traps are being prepared. Trapping will begin on July 15. We will not be able to dart until October. We have 22 collars ready. Seven are GPS collars. 15 are VHF collars. The VHF collars are still relevant for census, mark capture/recapture, and mortality issues.

It is observed that Meadowbrook elk migrate to the mountains in the winter and to the valley in summer. It is probably a matter of nutrition. There may be an instance of a migration. An elk with a white collar has been observed near Lester. Harold and Michael Walter have been working at the CCC Flats site pulling brush out of the pre-commercial thinned (PCT) area. Having spoken to nearly all the people that harvested elk in the 2009 season in game unit 460, almost all of these were within the boundaries of Special Hunt Area 4601. The Muckleshoot Indian Tribe has been collaring calves in the Green River, one was from an 18 year old cow.

6. Education and Outreach (E&O) Committee Report by Kalli Willson, Committee Chair

The elk group will host a booth at North Bend's Festival at Mount Si August 13, 14, and 15. A sign up sheet was provided. Hours hosting the elk group booth qualify for Master Hunter Permit Program volunteering hours. Help is needed to prepare the following:

Tent, Tables, Chairs, Maps, Literature, Skulls, Chocolate Covered Raisins

Recess

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7. Nomination for Director, Citizen at Large Position 2

Member Andrea Toomey volunteered to participate as a director and was confirmed by a unanimous vote of the membership.

8. Board of Directors Attendance

A quorum was present for the meeting including:

David Willson President	Don Hacherl Representing Small Property Owners
Harold Erland Vice President	Tom Kemp Representing Commercial Interests
Maura Callahan Representing Wildlife Enthusiasts	Phil Cassady Citizen-at-large position 1
Jeff Dideon Representing Hunters	Andrea Toomey Citizen-at-large position 2

9. Treasurer's Report

Treasurer Jim Gildersleeve was absent. He prepared a report in advance which was circulated at the meeting (also attached below). It show a projected balance of \$1642.70. Ms. Toomey motioned to approve the report, Mr. Hacherl seconded the motion. The motion to approve was unanimous.

10. Allocation of \$250 for the Festival at Mount Si

Treasurer Jim Gildersleeve's advice on the matter is that there is plenty room in the budget for this allocaton. Mr. Erland moved to authorize the allocation. Mr. Hacherl seconded the motion. The motion to approve was unanimous.

11. Modification to the bylaws to accommodate a tiered membership scheme (Amendment 5).

A number of alternatives were circulated in advance. Alternative 4 is:

3.2 Membership is open to all interested persons who pay the annual dues of \$10 or purchase tiered annual memberships at rates established by the Board where the amount in excess of \$10 is deemed a donation, or life membership. Life memberships are effective for life and cost \$250.

3.3 Official representatives of governmental entities or Indian Tribes are members without a dues assessment. Membership runs from July 1 through June 30 of each year and begins in 2009. Non-members may attend meetings of the "Group as a whole," but only as observers. They enjoy no right of recognition by the President or presiding officer.

Mr. Hacherl moved to select the language of Alternative 4 for Amendment 5. Mr. Erland seconded the motion. The motion to approve was unanimous.

12. For the Good of the Order

Officer Chris Moszeter, DFW: The state law with regard to telemetry equipment in hunting situations is as follows:

Washington Administrative Code 232.12.045 Hunting Equipment Restrictions

(2) It is unlawful to use radio-telemetry equipment to locate and hunt wildlife with transmitters attached to them.

Telemetry data is considered to be sensitive information. Within the spirit of the law and to reduce public relations controversy regarding the matter, all volunteers participating in the telemetry part of the study are asked to formally acknowledge that they will not hunt elk in Game Unit 460 or Special Hunt area 4601 for a period of one year after using the telemetry equipment. A sample wavier form was provided. Signed copies of this acknowledgement should be returned to Chris Moszeter.

Meeting was adjourned at 8:30 p.m.

TREASURER'S MONTHLY REPORT
UPPER SNOQUALMIE VALLEY ELK MANAGEMENT GROUP
PO BOX 700
NORTH BEND, WA 98045

Date: 06/08/2010

Balance on hand as of last meeting:	\$4653.45	
Dues and new memberships paid	90.00	
Donations		.00
On-hand assets	_____	
Total Assets		\$4743.45
Disbursements:		
Vectronic Aerospace GMBH (Power supply & Yagi)		\$ 187.14
Money conversion fee to Euros		\$ 5.61
Reserve Fund		.00
Balance on Hand (Date of Report)		\$ 4550.70
Verified with on-line banking		\$ 4550.70
On hand bills:		
Telonics-10 VHF collars (Snoqualmie's)	\$ 2838.00	
PO Box Renewal	\$ 70.00	
Projected Balance:		\$ 1642.70

Jim Gildersleeve
Treasurer
6/08/2010



Telemetry Volunteer Waiver



Based on public perception of this five year study and the fact that volunteers involved in this study area acting as agents of the state of Washington WDFW requires that all volunteers sign this waiver and abide by the following requirements.

1. Volunteers involved in the telemetry portion of the study will not hunt Game Management Units 460 or Special Hunt Area 4601 for a term of one year from the last time they took part in telemetry work.
2. Volunteers agree not to share or discuss telemetry data with individuals not involved in the study that plan to hunt Game Management Unit 460 or Special Hunt Area 4601.

Failure to comply with the above will result in removal from the study and in the case of Master Hunters a recommendation for *termination* from the Master Hunter Program will be brought to the Master Hunter Review Board.

Signature: _____

Printed Name: _____

Date: _____