

From: [Cooley, Hilary](#)
To: [Kasworm, Wayne](#)
Subject: Fw: [EXTERNAL] CALL IN INFORMATION for the North Cascades Subcommittee of IGBC Fall 2020 Meeting 11/24/20
Date: Monday, November 23, 2020 11:48:10 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[NCE Grizzly Bear Subcommittee Mtg Agenda Nov 2020.pdf](#)
[5-Year Plan Goals Objectives Strategies with Annual Work Plan Elements Nov20.xlsx](#)
[DOW GrizzlyGISAnalysis Report Final 20201117.pdf](#)
[DRAFT 09 June 2020 NCE Grizzly Bear Subcommittee Spring Mtg Notes.pdf](#)

Hi Wayne,

I'm going to miss this meeting tomorrow - I'll be out with WYGF to see the 399 situation.

The only thing I was going to mention is the 5yr review. Would you mind covering?

Can you give them this update:

- still on track to finish in March
- 5yr review is on listed entity, so lower-48
- 5yr review will make recommendation on whether it should remain T or change.
- It is only a recommendation, so if a change is recommended, we would then have to put out proposed rule, take public comment, and then a final rule.

Thanks wayne

From: Shilley, Catherine - FS <catherine.shilley@usda.gov>

Sent: Monday, November 23, 2020 10:54 AM

To: Bail, Kristin - FS <Kristin.Bail@usda.gov>; Cooley, Hilary <hilary_cooley@fws.gov>; Taylor-Goodrich, Karen F <Karen_Taylor-Goodrich@nps.gov>; Kurz, Gregg <gregg_kurz@fws.gov>; Branton, Nicole -FS <nicole.branton@usda.gov>; Weil, Jody - FS <Jody.Weil@usda.gov>; brendan.brokes@dfw.wa.gov <brendan.brokes@dfw.wa.gov>; andrew.murdoch@dfw.wa.gov <andrew.murdoch@dfw.wa.gov>; Rohrer, John -FS <john.rohrer@usda.gov>; Braaten, Anne M <Anne_Braaten@nps.gov>; Kasworm, Wayne <wayne_kasworm@fws.gov>; Plumage, Jesse -FS <jesse.plumage@usda.gov>; scott.fitkin@dfw.wa.gov <scott.fitkin@dfw.wa.gov>; Kuk, Monte - FS <monte.kuk@usda.gov>; scott.fisher@dnr.wa.gov <scott.fisher@dnr.wa.gov>; Froschauer, Ann <ann_froschauer@fws.gov>; Shultz, Denise M <Denise_M_Shultz@nps.gov>; Hada, Susan -FS <susan.hada@usda.gov>; Smith, Kate <kate.smith@mso.umd.edu>; gbopexedir@gmail.com <gbopexedir@gmail.com>; andrealyons3@gmail.com <andrealyons3@gmail.com>; bgaines@genext.net <bgaines@genext.net>; chrismorgan@insightwildlife.com <chrismorgan@insightwildlife.com>; gtaylor@npca.org <gtaylor@npca.org>; jimdavispcpc@comcast.net <jimdavispcpc@comcast.net>; jscott@conservationnw.org <jscott@conservationnw.org>; pjalthrop@yahoo.com <pjalthrop@yahoo.com>; rsmith@npca.org <rsmith@npca.org>; rkrehbiel@defenders.org <rkrehbiel@defenders.org>; stevetaber2003@gmail.com <stevetaber2003@gmail.com>; wendy.gardner@zoo.net <wendy.gardner@zoo.net>

Cc: Shilley, Catherine - FS <catherine.shilley@usda.gov>

Subject: [EXTERNAL] CALL IN INFORMATION for the North Cascades Subcommittee of IGBC Fall 2020

Meeting 11/24/20

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Greetings! Below is the call-in number to join the Fall 2020 North Cascades Subcommittee meeting of IGBC on Tuesday, November 24th, 9:00 a.m. to 12:00 p.m.

Please Dial: **1-888-844-9904 / Access Code: 1858157**

Attached please find the agenda for tomorrow's meeting, as well as documents for review. Thank you.

From: Shilley, Catherine - FS

Sent: Thursday, October 8, 2020 10:10 AM

To: Bail, Kristin - FS <Kristin.Bail@usda.gov>; hilary_cooley@fws.gov; Karen_Taylor-Goodrich@nps.gov; gregg_kurz@fws.gov; Branton, Nicole -FS <nicole.branton@usda.gov>; Weil, Jody - FS <Jody.Weil@usda.gov>; brendan.brokes@dfw.wa.gov; andrew.murdoch@dfw.wa.gov; Rohrer, John -FS <john.rohrer@usda.gov>; Anne_Braaten@nps.gov; wayne_kasworm@fws.gov; Plumage, Jesse -FS <jesse.plumage@usda.gov>; scott.fitkin@dfw.wa.gov; Kuk, Monte - FS <monte.kuk@usda.gov>; scott.fisher@dnr.wa.gov; ann_Froschauer@fws.gov; denise_m_shultz@nps.gov; Hada, Susan -FS <susan.hada@usda.gov>

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Subject: North Cascades Subcommittee of IGBC Fall 2020 Meeting

Importance: High

Please mark your calendar for Tuesday, November 24th, 9:00 a.m. to 12:00 p.m. A meeting invitation and agenda will be send out soon. If you would like to propose any agenda items for this meeting, please contact John Rohrer, Technical Team Chair, at john.rohrer@usda.gov

Also, please find attached the notes from the June 9th spring meeting. Please review these prior to the November 24 meeting and have any comments or edits ready to present at the beginning of the meeting.



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**NORTH CASCADES ECOSYSTEM SUBCOMMITTEE
INTERAGENCY GRIZZLY BEAR COMMITTEE**

**Fall Meeting 2020
24 November 2020
9:00am – 12:00pm**

Conference line: **1-888-844-9904**
Access Code: **1858157**

- | | | |
|-------|---|--------------------------------|
| 9:00 | Welcome/Rules of Engagement
Introductions
Review of June 2020 meeting notes | Kristin Bail |
| 9:15 | Agency Updates – 10 minutes each | |
| | North Cascades National Park | Karen Taylor-Goodrich |
| | US Fish & Wildlife Service
IGBC Recovery Office | Hilary Cooley
Wayne Kasworm |
| | WA Department of Fish & Wildlife | Brendan Brokes |
| | Mt. Baker-Snoqualmie National Forest | Nicole Branton |
| | Okanogan-Wenatchee National Forest | Kristin Bail |
| | British Columbia Ministry of FLNRO | Garth Mowat |
| 10:00 | NCE Action Plan – 2020 Planned Actions and 2021 Proposed Actions
Goal #1: Establish and implement clear direction for recovery

Goal #2 Maintain or enhance habitat conditions for Grizzly Bears

Goal #3 Document presence of Grizzly Bears | |
| 11:15 | Western Wildlife Outreach Update | Lorna Smith |
| 11:30 | Defenders of Wildlife Presentation of their
Coexistence and Core Habitat GIS Analyses | Zoe Hanley |
| 11:45 | Public Comments | |



North Cascades Ecosystem Grizzly Bear Coexistence and Core Habitat GIS Analyses

November 17, 2020

Prepared For:

Defenders of Wildlife

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Suggested Citation

Belmar, Melissa. 2020. *North Cascades Ecosystem Grizzly Bear Coexistence and Core Habitat GIS Analyses*. Collective Ecological Consulting, Denver, Colorado.

Photo Credit

Defenders of Wildlife (<https://defenders.org/got-grizzlies>).

TABLE OF CONTENTS

1.0	Introduction & Purpose	3
1.1	Human-Grizzly Bear Coexistence Analysis	3
1.2	Grizzly Bear Core Habitat Analysis	3
2.0	Methodology	4
2.1	Human-Grizzly Bear Coexistence Analysis	4
2.1.1	Background Research and Communication	4
2.1.2	Variables Analyzed	4
2.1.3	GIS Processing	8
2.2	Grizzly Bear Core Habitat Analysis	8
2.2.1	Background Research and Communication	8
2.2.2	Variables Analyzed	9
2.2.3	GIS Data Processing	11
3.0	Results and Discussion	13
3.1	Human-Grizzly Bear Coexistence Analysis	13
3.2	Grizzly Bear Core Habitat Analysis	14
4.0	Conclusions and Recommendations	14
4.1	Data Gaps	14
4.1.1	Human-Grizzly Bear Coexistence Analysis	14
4.1.2	Core Habitat Analysis	15
5.0	References	16

APPENDICES

Appendix A: Figures.....	18
Appendix B: Human-Grizzly Bear Coexistence Analysis Data Sources.....	23
Appendix C: Human-Grizzly Bear Coexistence Data Summary by BMU	27
Appendix D: Core Habitat Analysis Data Sources	30
Appendix E: Core Habitat Analysis Data Summary by BMU	32

LIST OF TABLES

Table 1. Grizzly Bear Core Habitat Scenarios	12
Table 2. Grizzly Bear Core Habitat Results (Hectares)	14

LIST OF FIGURES

Figure 1. North Cascades Ecosystem Grizzly Bear Recovery Zone Location.....	19
Figure 2. Areas in Need of Grizzly Bear Coexistence Measures in the NCE.	19
Figure 3. Areas in Need of Grizzly Bear Coexistence Measures by Variable Type.....	20
Figure 4. Grizzly Bear Core Habitat for Scenarios 1 through 4 in the NCE (public lands and core habitat areas ≥ 2,500 acres).	21
Figure 5. Grizzly Bear North Cascades Ecosystem Bear Management Units.....	22

1.0 Introduction & Purpose

The grizzly bear (*Ursus arctos horribilis*) was listed under the Endangered Species Act (ESA) as threatened in 1975 and recovery efforts subsequently followed in its range in four states. Six recovery zones were created in Montana, Idaho, Washington, and Wyoming (USFWS & NPS 2017). The North Cascades Ecosystem (NCE) recovery zone located is in north western and north-central Washington. The NCE also crosses the Canadian border, but this report will only address the U.S. portion of the recovery zone. The NCE is primarily comprised of public lands, including North Cascades National Park (NOCA), Okanogan and Wenatchee National Forest (OKWE NF), and Mt. Baker and Snoqualmie National Forest (MBS NF).

The NCE grizzly bear recovery zone has been documented as “one of the most intact wildlands in the contiguous U.S. (Servheen et al. 1991).” Historical records indicate that grizzly bears once occurred in the NCE, but the current population is unknown. Only four detections of grizzly bears have occurred in the NCE in the past 10 years, all of which were in Canada. There has been no confirmed evidence of grizzly bears within the ecosystem in the U.S. since 1996. The 2012 estimate for the Canadian portion was six grizzly bears. It is therefore unlikely that the U.S. portion of the NCE currently contains viable grizzly bear populations or individuals (USFWS & NPS 2017).

This report outlines two projects: an assessment of potential areas in need of grizzly bear coexistence measures and an analysis of grizzly bear core habitat within the NCE. These projects were initiated in anticipation of restoring a viable grizzly bear population in the NCE – through natural recolonization or augmentation – in the near future. **Figure 1** displays the location of the NCE (**Appendix A**).

1.1 Human-Grizzly Bear Coexistence Analysis

Human-wildlife conflict is a consequence of humans and wildlife competing for space and resources and often results in negative outcomes for both parties involved. Humans are persistently encroaching on wildlife habitat, which increases the chances for human-wildlife encounters (NCDE Subcommittee 2019). Studies have found that the majority of human-grizzly bear conflicts were related to human foods, or attractants (Wilson et al. 2006; NCDE Subcommittee 2019), such as livestock, beehives, bird feeders, human food, garbage, hunter-harvested wildlife carcasses, and orchards among many others (NCDE Subcommittee 2019). Modeling and research has also found reducing human access to bear habitat (Wilson et al. 2006), securing attractants through electric fences (Eneas 2020), and grizzly bears adapting to human behaviors by adjusting their peak activity times (Lamb et al. 2020) are some of the ways to increase coexistence between grizzly and human communities.

The human-grizzly bear coexistence assessment identifies potential conflict areas, or hotspots, within the NCE where human and grizzly bear interactions could occur. These hotspots highlight areas in need of proactive coexistence measures and identify management priorities within the NCE. Coexistence measures that can be taken in potential hotspots include electric fencing around cattle and backyard farms, ensuring that bear-safe trash cans are present in campgrounds and neighborhoods, distributing and providing bear awareness information, and changing various practices such as private forestry operations feeding black bears or moving livestock boneyards away from potential conflict areas. These proactive strategies can help to reduce conflicts, minimize the number of bears habituated to human attractants, and substantially reduce lethal removals if grizzly bears are restored to the NCE.

1.2 Grizzly Bear Core Habitat Analysis

The restoration of grizzly bears in the NCE will require the identification of areas that provide adequate habitat, which is dependent upon habitat connectivity, resource productivity and quality, food availability, and levels of human disturbance (NCDE Subcommittee 2019). Many other recovery zones have identified “core habitat”, calculated based on land connectivity and disturbance levels from the presence of roads and trails. Most other grizzly bear ecosystems in the U.S. that have

identified core habitat areas (Northern Continental Divide Ecosystem [NCDE], Yellowstone Ecosystem) highlight roads as the primary disturbance to secure blocks of grizzly bear habitat and use them in their core habitat analyses. Research has specifically shown that motorized access density can strongly influence grizzly bear populations through reduced habitat use and increased mortality rates. Non-motorized high-use trails have also been considered in some ecosystems, but researchers have found it difficult to define high-use trails and track trail usage (NCDE Subcommittee 2019).

The NCE Subcommittee of the Interagency Grizzly Bear Committee (IGBC) previously began efforts to identify core habitat for the NCE, but efforts were not finalized. This analysis is meant to be a continuation of previous studies but is being completed with new, updated data. However, this study is not comprehensive and should not be considered a final core habitat layer. It is meant to be a baseline for the federal agencies to create an updated core habitat analysis prior to grizzly bear recovery in the NCE.

2.0 Methodology

2.1 Human-Grizzly Bear Coexistence Analysis

2.1.1 Background Research and Communication

Prior to conducting the GIS analysis, a literature review identifying variables to consider in the project was performed. Several articles were reviewed as a preliminary measure, and then associated GIS data were found through online and personal sources to use in the GIS analysis. Additionally, several experts in the field from state, federal, and non-profit organizations were contacted and interviewed for information on the subject matter.

2.1.2 Variables Analyzed

Numerous variables were used to analyze potential conflict areas in the NCE. Variables selected were based on research available and conversations with experts in the field with personal knowledge about human-grizzly bear conflicts that have occurred in other US ecosystems.

2.1.2.1 Campgrounds

Campgrounds present grizzly bears with the opportunity to gain access to human-related attractants such as garbage and human foods (NCDE Subcommittee 2019). As a result, campgrounds were identified as a potential high conflict area.

Campground data sets were retrieved from the US Forest Service (USFS) and the National Park Service (NPS) staff and websites. MBS NF data were received from staff (Jesse Plumage) and data attributes were already populated with the campground names and capacity. OKWE NF data were downloaded from the USFS website. Many of the OKWE NF campgrounds in the GIS data did not have capacity information available in the attributes. The USFS website was searched for information about campground capacities and attributes were populated accordingly. It was assumed that a single campsite accommodated eight people and a double campsite accommodated 16 people. Capacity numbers for these two forests are estimates and may not be completely accurate. Data for NOCA National Park was retrieved from NPS staff (Anne Braaten) and contained capacity data. All campground data were point files, and they were buffered by 0.25 miles to create a circular polygon that represented the potential area the campground covered. Campgrounds were additionally buffered by 500 m to account for additional disturbance and conflict areas.

2.1.2.2 Crops

Fruit is an important food source for grizzly bears, and some individuals have been documented to opportunistically consume crops from orchards and other farms (Mace & Jonkel 1986). Black bears have been documented to feed at orchards or backyard apple trees in areas of the NCE (Davis et al. 2005). Crop data polygons representing orchards, berry farms, and vineyards from the Washington State Department of Agriculture (WSDA) were used to delineate potential bear agricultural attractant areas.

2.1.2.3 Hobby Farms

Hobby farms have long been attractants of grizzly bears. Our study analyzed the presence of beehives, goats, and chicken farms. Data from the US Department of Agriculture (USDA) Census of Agriculture was used for these three variables, which are discussed individually below.

2.1.2.3.1 Beehives

Beehives are known to be an attractant to bears, as they supply a rich source of simple carbohydrates (Wilson et al. 2005). Research has found that beehives have one of the higher conflict rates compared to other attractants (Wilson et al. 2005, 2006) and have much higher rates when near creeks or streams, and wetland or riparian areas (Wilson et al. 2005). Black bears have been documented to damage beehives in some counties of the NCE (Davis et al. 2005). Protected beehives with electric fences, have been proven to be less of an attractant than unprotected beehives (Wilson et al. 2005).

Data from the USDA Census of Agriculture documenting bee colony number by county was used for the analysis (USDA 2017). Bee colony number was entered into attributes of a county polygon GIS file from the State of Washington GIS portal.

2.1.2.3.2 Chickens

Grizzly bears often seek animal protein as a high source of energy and protein that is prized for hibernation preparation. The surge in backyard farms that may include chickens and other small livestock present an opportunity for grizzly bears to acquire food but also is likely to create human-wildlife conflicts (Eneas 2020).

Data from the USDA Census of Agriculture documenting the number of chicken farms with one to 49 chickens by county was used for the analysis (USDA 2017). The number of chicken farms were entered into attributes of a county polygon GIS file from the State of Washington GIS portal. Chicken farms with less than 49 chickens were assumed to be small, hobby backyard farms that are less likely to have protective measures, such as electric fences.

2.1.2.3.3 Goats

Similar to hobby chicken farms, many urban and rural residents are raising goats in backyards, which present an opportunity to grizzly bears to acquire a food source.

Data from the USDA Census of Agriculture documenting the number of goats by county was used for the analysis (USDA 2017). The number of goats were entered into attributes of a county polygon GIS file from the State of Washington GIS portal.

2.1.2.4 Housing Density

Increased conflicts are expected in areas with more sources of anthropogenic foods and attractants, such as trash cans and bird feeders (NCDE Subcommittee 2019). To represent these potential conflict areas in populated places, housing unit number data were used from the 2010 US Census. The number of housing units in a census district was used in the analysis to represent the density of humans in an area, which is likely to correlate with the number of attractants in an area.

2.1.2.5 Hunting

Hunting-related grizzly bear mortalities have been recorded as a result of mistaken identity and defense of life. Grizzly bears will often prioritize consumption of animal protein food sources and may attempt to take ungulate carcasses obtained by hunters, resulting in conflict between the two. Efforts to obtain hunter acquired ungulate carcasses may also increase in years when other food sources are low or inadequate (IGBST 2009).

Hunting game management unit (GMU) hunter days data from 2019 were used to represent the amount of time hunters were on the ground in the NCE. GMUs with higher hunter days were assumed to have a higher chance of grizzly bear-human conflicts. Data were obtained from Washington Department of Fish and Wildlife (WDFW).

2.1.2.6 Livestock / Grazing

Livestock have long been an attractant to grizzly bears, resulting in major conflicts between humans and grizzly bears. Grizzly bears have been associated with sheep lambing areas or calving pastures (Wilson et al. 2005, 2006). Sheep pastures and lambing areas have been documented to result in more conflicts, but conflicts with cattle and calving areas have also been recorded frequently (Wilson et al. 2005).

Livestock density per grazing allotment data were used to represent areas where grizzly bear-livestock conflicts could occur. Data used were obtained from the Forest Service Geodata Clearinghouse. The number of individuals on the allotments were divided by the area of the allotment.

2.1.2.6.1 Private Land Pastures

Private land pastures were highlighted in the analysis as many ranchers keep cattle and sheep on private lands during lambing and calving periods. Grizzly bears conflicts have been documented to increase in the spring during this time (Wilson et al. 2005), and therefore these areas were attributed an additional score to be added onto other livestock grazing data. Additionally, conflicts are presumed to be heightened in areas where private land pastures are adjacent to protected, public lands with forests. These areas were also considered and given an even higher potential conflict score.

Private land pastures data were obtained from combining pasture data from the National Land Cover Dataset (NLCD) and the WSDA to create a master pasture file. These data were overlaid with the Bureau of Land Management (BLM) private land ownership data to create a file that represented private land pastures in the NCE.

Additionally, a file was created that represented forested public lands by intersecting public lands in the BLM landownership file with the NLCD forested areas. Private land pastures that were adjacent to forested public lands were selected for and given a higher score than simply private land pastures.

2.1.2.7 Other Recreational Activities

Other recreational activities were rated by their potential to attract bears. Other recreational activity points included trailheads, picnic areas, scenic overlooks, boating areas, fishing areas, interpretative areas, winter recreational activities, cabins, and rock climbing areas. Recreational activity areas were generally assumed be areas where humans may have food or there could be unsecured trash that would attract grizzly bears. Additionally, winter recreation areas were considered, as they have been shown to occasionally cause den abandonment and conflicts, although many bears tend to tolerate disturbances during hibernation (Linnell et al. 2000).

All recreational sites were points were buffered by 0.25 miles to account for the area where they exist and then by another 500 m to account for potential attraction and conflict areas. Other recreational activity data sets were retrieved from USFS. MBS NF data were received from staff (Jesse Plumage).

OKWE NF data were downloaded from the USFS website. Other recreation data was not available for NOCA NP.

2.1.2.8 Private Forest Operations

Private forest operations present in Washington carry out practices that would affect grizzly bears if they were restored to the NCE. Annually, many timber companies that own private forests (not on public lands) distribute large quantities of a pelletized molasses in order to attract black bears and prevent them from stripping the bark on trees they plan to use for timber sales (R. Beausoleil and L. Welfelt, *personal communication*; Nolte et al. 2002; Zielgtrum 2004). Grizzly bears are highly likely to be attracted to this food source as well. It has been documented that numerous black bears will congregate in an area with the attractant, and even travel outside of their home range just to feed. Potential conflict in these areas between bears and with humans is highly probable if this practice continues. Data for private forest operations were obtained from Zoe Hanley from a landuse layer, where “Designated forest land under chapter 84.33 RCW” and “Timberland classified under chapter 84.34 RCW” were extracted to represent potential private forest operations.

2.1.2.9 Rivers and Streams

Areas near rivers and streams are heavily used by grizzly bears for foraging activities. Wilson et al. (2005) found that one of the highest conflict areas documented were those near streams and creeks. Grizzly bear conflicts documented near rivers and streams usually occurred within a mean distance of 1.8 km. of the waterway (Wilson et al. 2005). River and stream data were obtained from the National Hydrography Dataset (NHD). If river and stream data were buffered by 2 km, the entire NCE would be covered by the buffered dataset. As a result, these data were removed from the analysis because the data did not highlight focal areas where the highest conflicts could occur, but instead encompassed the entire NCE.

2.1.2.10 Roads

Roads have been shown to disturb and cause conflicts with many animal species, including wide-ranging mammals, such as grizzly bears. Impacts of roads include displacement, animal avoidance of areas, car collisions, and the creation of detrimental edge effects to habitats. Grizzly bears have been documented to be victims in car collisions (Gaines et al. 2003). Bears may also use man-made roads and trails as travel routes (Davis et al. 2005). In this analysis, roads were buffered by 500 meters, which is based on a research on displacement of grizzly bears from roads and trails (Gaines et al. 2003).

Road datasets were retrieved from the USFS and the NPS staff and websites. MBS NF data were received from staff (Jesse Plumage). Okanogan and Wenatchee Forest data were downloaded from the USFS website. NPS data were received from NPS staff (Anne Braaten). All road data files were merged into one dataset and any overlapping roads were removed. Roads were buffered by 11 ft to account for road width, and then by 500 m to account for potential conflict and disturbance areas. All roads were scored the same.

2.1.2.11 Trails

Both motorized and non-motorized trail use have been shown to impact wide-ranging mammals, including grizzly bears. The most commonly documented impact from trail use is displacement of individuals, but trails also increase the chances of poaching, collisions with cars, and recurring negative human-wildlife interactions near campgrounds that are accessed by trails (Gaines et al. 2003). Bears may also use man-made roads and trails as travel routes (Davis et al. 2005). In this analysis, trails were buffered by 500 meters, which is based on research regarding displacement of grizzly bears from roads and trails (Gaines et al. 2003).

Trail datasets were retrieved from the USFS and the NPS staff and websites. MBS NF data were received from staff (Jesse Plumage), which contained usage data. OKWE NF data were downloaded

from the USFS website and did not contain usage data. NPS data were received from NPS staff (Anne Braaten) and also did not contain usage data. All trail data files were merged into one dataset. Trails were buffered by 0.6 m (2 ft) to account for the trail width, and then by 500 m to account for potential conflict and disturbance areas. Trails were scored according to their usage (high, medium, low). Trails without any usage data were assumed to “medium” use and were scored accordingly.

2.1.2.12 Wetland Areas

Riparian and wetland areas provide ample high quality grizzly bear habitat and have been documented to be used for travel, foraging, and cover during spring and fall seasons (Wilson et al. 2005). Wilson et al. (2005) found that nearly half of the cumulative number of conflicts occurred within 200 m of a wetland or riparian area (Wilson et al. 2005). National Wetlands Inventory (NWI) data were retrieved to represent wetland areas with only freshwater emergent wetlands and forested scrub wetlands extracted for the analysis. These wetland areas were then buffered by 200 m. Additionally, since the NWI data for the state did not include riparian areas, a 200 m buffer of named NHD streams and rivers was used to represent riparian areas.

2.1.2.13 Whitebark Pine Forests

Whitebark pine nuts are an important food source for grizzly bear populations in the western U.S., but it is unlikely to be a substantial component of grizzly bear diets in the NCE. As a result, this variable was considered but was ultimately removed from the analysis.

Whitebark pine nuts are prized due to their high content of protein and fat, which is essential for creating winter hibernation fat stores (Blanchard 1989). When nuts are available, grizzly bears may consume them solely and exclude other food sources. Cone production varies annually, making their presence even more important for grizzly bears when they are available for consumption (Blanchard 1989). Grizzly bears have been found to travel more per day during poor cone production years in search of cones (Blanchard & Knight 1991). Additionally, individuals were found to travel to different elevations in search of cones when cone production varied. Individuals were found to occupy the highest mean elevations during good nut production years, lower elevations during moderate nut production years, and the lowest during poor nut production years (Blanchard & Knight 1991).

Research has also shown a trend in more female grizzly mortalities during Fall months with poor whitebark pine cone production (IGBST 2009). It is predicted that more wildlife-human conflicts arise in these years, as individuals move longer distances and to lower elevations during low cone production years. Females may also search for other protein and fat rich foods during low cone production years, such as ungulates. Conflicts with hunters and ungulate carcasses may result during these time periods (IGBST 2009).

2.1.3 GIS Processing

Most of the datasets obtained were in vector format and were converted to raster files with a 30 m resolution. Once all variable datasets were converted to rasters, attributes were reclassified using the Reclassify tool to scores listed in **Appendix B**. Reclassification ranks of 1 (low conflict risk) – 10 (high conflict risk) were assigned to each variable based off of peer-reviewed literature and personal communications with field experts. The reclassified data sets were then all used to create a suitability model in the Cell Statistics tool, which added up the sum of the scores from all datasets. The result was a raster dataset with 30 m cells that represent a cumulative score of all the variables analyzed.

2.2 Grizzly Bear Core Habitat Analysis

2.2.1 Background Research and Communication

Prior to conducting the GIS analysis, a literature review identifying variables to consider in the project was performed. Several articles were reviewed as a preliminary measure, and then associated GIS

data were found through online and personal sources to use in the GIS analysis. Additionally, several experts in the field from federal agencies were contacted for information about the subject matter. Conducting a core habitat analysis for the NCE was initiated by the USFS and NPS in the late 1990's and has been an evolving process ever since. A new core habitat analysis was planned to occur as a result of the creation of the NCE Draft Grizzly Bear Restoration Plan/Environmental Impact Statement (USFWS & NPS 2017), however, the project was recently terminated by the current federal administration.

2.2.2 Variables Analyzed

2.2.2.1 Roads

Most core habitat studies calculate two scenarios based on road maintenance status:

- Total Motorized Route Density (TMRD) - a moving window analysis calculation that applies to the primary conservation area portion of the ecosystem and includes Federal, State, and Tribal roads and motorized trails that do not meet the definition of an impassable route (NCDE Subcommittee 2019).
- Open Motorized Route Density (OMRD) - a moving window analysis calculation that applies to the primary conservation area portion of the ecosystem and includes Federal, State, and Tribal roads and motorized trails that are open to wheeled motor vehicle use by the public for any part of the non-denning season (NCDE Subcommittee 2019).

These two calculations require the understanding and classification of roads in the USFS road layers to maintenance levels. USFS roads are classified according to the following maintenance levels:

- 1 – Basic custodial care (Closed)
- 2 – High clearance vehicles
- 3 – Suitable for passenger cars
- 4 – Moderate degree of user comfort
- 5 – High degree of user comfort

In addition, roads are referred to as impassable and decommissioned in the OMRD and TMRD definitions. These terms are defined as:

- Decommissioned - The stabilization and restoration of an unneeded road to a more natural state. Decommissioned roads do not count towards Total Motorized Route Density (TMRD) as long as they meet the definition of impassable (NCDE Subcommittee 2019).
- Impassable - A road that has been treated in such a manner that the road is blocked and there is little resource risk if road maintenance is not performed on a regular basis (self-maintaining). These roads are not counted in the Total Motorized Route Density (TMRD) as long as the road (generally the first 50 to 300 feet) has been treated to make it inaccessible to wheeled motorized vehicles during the non-denning season. Roads may become impassable as a result of a variety of means, including but not limited to one or more of the following: natural vegetation growth, road entrance obliteration, scarified ground, fallen trees, boulders, culvert or bridge removal, etc. Impassable roads may remain on the inventoried road system if use of the road is anticipated at some point in the future (NCDE Subcommittee 2019).

Road data for MBS NF was obtained from Jesse Plumage and was recently updated in the Forest Plan (USFS 2016). This dataset includes the most recent data about road operation maintenance levels, although 587 miles of road were not classified. It does not include information about "impassable" routes that is needed for the TMRD calculations. It does however contain information about roads classified as "1" that are decommissioned. Not all roads that are classified as "1" are considered decommissioned,

so some roads that are “1” but are not considered decommissioned are used in the TMRD calculation. This information was therefore used as the best information available to classify TMRD. All roads used in the analyses were buffered by 500 m.

OKWE NF road data were obtained from the USFS data clearinghouse and have not been updated in recent years. Road data for the two forests were separated into two GIS layers for each forest. Okanogan NF had a recent change to road data that may represent incorrect information. Roads classified as “1” or closed, may actually be open to OHVs (J. Rohrer, *personal communication*). As a result, roads classified as 1-5 in the Okanogan NF were considered in OMRD calculations, whereas in other forests included in the analysis, only roads classified as 2-5 were used. Similar to MBS NF data, both Okanogan and Wenatchee NF road datasets do not include information about “impassable” routes that is needed for the TMRD calculations. It does however contain information about roads classified as “1” that are decommissioned. Not all roads that are classified as “1” are considered decommissioned, so some roads that are “1” but are not considered decommissioned are used in the TMRD calculation. This information was therefore used as the best information available to classify TMRD. Not all roads were classified in the dataset on the 1-5 scale (<1 mile), and therefore not included in the analysis. All roads used in the analyses were buffered by 500 m.

NOCA NP road data were retrieved from Anne Braaten. Not many roads exist in the park and therefore the dataset was simple and easy to use. All roads used in the analyses were buffered by 500 m.

Other roads were represented by TigerLines streets dataset obtained online from the Geospatial Data Gateway. This dataset was found to be the most comprehensive roads layer for the NCE. To ensure overlap did not occur between this dataset and USFS road datasets, TigerLines were erased within the NFs and the NOCA NP and only used for areas outside of these public lands. All roads used in the analyses were buffered by 500 m.

2.2.2.2 Trails

Trails data for MBS NF was obtained from Jesse Plumage and was recently updated in the Forest Plan (USFS 2016). This dataset includes the most recent data about trail usage, although not all trails are classified. Trails not classified were not included in the analysis. Only trails classified as high-use were used and were buffered by 500 m.

OKWE NF trails data were obtained from the USFS data clearinghouse and have not been updated in recent years. Trails data did not contain any use information and therefore all trails were included in the analysis (Scenarios 3 & 4). All trails used in the analyses were buffered by 500 m.

NOCA NP trails data were retrieved from Anne Braaten. Trails data did not contain use level and therefore all trails were included in the analysis. All trails used in the analyses were buffered by 500 m.

2.2.2.3 Landownership

Landownership data were retrieved from the Bureau of Land Management (BLM). Publicly-owned lands were extracted from the dataset for the analysis.

2.2.2.4 Grizzly Bear NCE Recovery Zone and BMU Outlines

Grizzly bear NCE and Bear Management Units (BMU) outlines were obtained from Anne Braaten (**Figure 5, Appendix A**). Datasets were the most updated, although Anne Braaten did note that changes should be made by the USFS and NPS to the outlines of the two datasets. Data were originally generated in 1993 but updated in 2009 and still need to be changed based on public land boundaries. The BMU and Recovery Zone outlines used in this study align with one another.

2.2.3 GIS Data Processing

Road and trail datasets were sorted based on the Scenarios listed below in **Table 1**. Once filtered, all roads and trails were buffered by 500 m and merged together. This file was then dissolved so that all features were made into one polygon feature without any overlaps.

The roads and trails dissolved datasets by Scenario were then intersected with the entire recovery zone. This resulted in a datafile with one trails and roads polygon, and the rest of the area designated as core habitat. The core habitat areas were edited and “exploded” into individual polygons. With data in this format, core habitat area acreages could be calculated. The analysis only considered polygons that were greater than or equal to 2,500 acres (3.91 mi² (10.12 km²) in size. Anything less than this acreage was considered too small to provide adequate habitat for grizzly bears and would not contribute to secure core habitat. Acreages for these polygons were calculated without consideration of the BMU outlines because a polygon that crosses BMU boundaries but is greater than 2,500 acres still provides habitat for the species despite it being in two different BMUs.

Once core habitat areas less than 2,500 acres were removed, the core habitat and roads/trails files were intersected with the BMU boundaries. This resulted in a product that contained all core habitat areas equal to or greater than 2,500 acres and all roads and/or trails within the NCE with BMU delineations.

Data were input into the attribute table regarding the BMU name, acreage, and whether the polygon was a road, trail, or core habitat. This dataset for each scenario was appended with “AllLand” as it represents all core habitat and roads/trails within the Recovery Zone without any landownership delineation. This file was then clipped with the BLM landownership public lands layer to create the Scenario file appended with “PublicLand.” In the end, each of the four Scenarios have two files (all land and public lands only), each with core habitat and road/trails areas by BMU.

Table 1. Grizzly Bear Core Habitat Scenarios

Scenario Number	1 (OMRD)	2 (TMRD)	3 (OMRD + Trails)	4 (TMRD + Trails)
Okanogan NF Roads	Roads classified as 1 - 5	Roads classified as 1– 5 (decommissioned excluded)	Roads classified as 1 - 5	Roads classified as 1– 5 (decommissioned excluded)
Wenatchee NF Roads	Roads classified as 2 - 5	Roads classified as 1– 5 (decommissioned excluded)	Roads classified as 2 - 5	Roads classified as 1– 5 (decommissioned excluded)
Mt. Baker/Snoqualmie Roads	Roads classified as 2 - 5	Roads classified as 1– 5 (decommissioned excluded)	Roads classified as 2 - 5	Roads classified as 1– 5 (decommissioned excluded)
NOCA NP Roads	All roads	All roads	All roads	All roads
Other Roads	All roads outside of NP and NF lands	All roads outside of NP and NF lands	All roads outside of NP and NF lands	All roads outside of NP and NF lands
Trails	No trails included	No trails included	MBS – High use trails NOCA – all trails OKWE – all trails	MBS – High use trails NOCA – all trails OKWE – all trails

All roads and trails were buffered by 500 meters.

3.0 Results and Discussion

3.1 Human-Grizzly Bear Coexistence Analysis

The results of the grizzly bear conflict database are displayed on **Figure 2 (Appendix A)**. Potential conflict areas were concentrated primarily in Snohomish and King Counties within the NCE. Additionally, high conflict areas were evident in parts of western and central Okanogan County, north central Kittitas County, central Whatcom County, and central Chelan County. Snohomish and King Counties are located near the major Seattle metro area, and large numbers of tourists and residents travel to the federal lands to the west for recreational opportunities. These areas also have higher populations of residents, more high-use trails, higher numbers of potential backyard farms with chickens and goats, and higher numbers of hunter days documented in GMUs that overlap with the counties. Areas that were given a high conflict rating in Okanogan County were likely due to the highest concentration of grazing allotments within the NCE.

In addition to the overall NCE analysis, conflicts were broken down into four categories based on the conflict type: residential, recreational, crops, and livestock. Landscape variables, such as wetlands, riparian areas and white bark pine were not included in this analysis. It was determined that incorporating landscape variables could override the impact of other conflict types that humans can mitigate. **Figure 3** displays the conflicts by type and all four categories area represented based on the same scoring scale (**Appendix A**). From these maps, it is apparent that residential and recreational coexistence need types have higher scores than crops and livestock. The table in **Appendix C** displays the highest coexistence need types by BMU. To identify Primary and Secondary coexistence needs the average pixel score by BMU and by category were calculated using Zonal Statistics. Using this methodology, the Primary coexistence need was found to be residential in 41 out of 42 of the BMUs and recreational in one of the 42 BMUs. The Secondary coexistence need was found to be recreational in 41 out of 42 of the BMUs and residential in one of the 42 BMUs.

To determine the type of Primary and Secondary coexistence needs within the residential and recreational categories, the average pixel score by variable (chickens, population density, trails, campgrounds, etc.) was calculated by BMU (**Appendix C**). This highlighted the variables with the highest score within a BMU. Chickens were found to have the highest score most frequently for primary coexistence needs (30 of the 42 BMUs). Other recreational activities were found to have the highest score most frequently for secondary coexistence needs (23 of the 42 BMUs). Recreation was determined to be the primary coexistence need in the Swauk BMU (42) and hunter activity was highlighted as the highest scoring variable type.

3.2 Grizzly Bear Core Habitat Analysis

Table 2 provides a summary of the core habitat analysis by Scenario and includes only public lands and core habitat areas greater than or equal to 2,500 acres. **Figure 4** displays the core habitat and road/trails areas by Scenario (**Appendix A**). **Appendix E** provides more details and a breakdown of the percentage of the overall BMU that is identified as core habitat and road/trails for each Scenario. Core habitat acreage is greatest for Scenario 1, where trails and all roads classified as “1” were not included. Calculations and maps display data on public lands only, as these areas are able to be conserved by the federal government. Roads and trails are primarily concentrated around the periphery of the NCE and near populated areas, reducing the amount of core habitat available.

Table 2. Grizzly Bear Core Habitat Results (Hectares)				
Scenario Number	1 (OMRD)	2 (TMRD)	3 (OMRD + Trails)	4 (TMRD + Trails)
Core Habitat (Acres)	1,714,153.9	1,673,680.0	1,260,053.1	1,231,042.6
Roads and Trails (Acres)	550,854.3	597,068.9	941,133.3	978,014.4

4.0 Conclusions and Recommendations

The human-grizzly bear coexistence analysis found that conflict areas were concentrated primarily in Snohomish and King Counties within the NCE. Additionally, high conflict areas were evident in parts of Okanogan County, Kittitas County, Whatcom County, and Chelan County. Data gaps were identified as part of the study and are discussed in more detail below. Residential conflict types were found to be the primary and recreational conflict types were found to be the secondary coexistence need in all but one BMU in the NCE. Filling data gaps in the future would solidify this study but as is, the study provides valuable information that will better help the public prepare for restoration of the grizzly bear to the NCE.

The core habitat analysis conducted provides a good baseline for understanding available habitat in the NCE for grizzly bears. However, improvements to data sources should be made in order to bolster the study and provide a better understanding of available habitat for this complicated analysis. Data gaps and future studies are discussed in more detail below.

4.1 Data Gaps

4.1.1 Human-Grizzly Bear Coexistence Analysis

- Livestock boneyards – Research has identified livestock boneyards as high conflict areas; however, no data sets were available on their locations within pastures and grazing allotments. The addition of this data would help to identify higher conflict areas when combined with the existing data used in this analysis.
- Trail Use – Usage data for trails was only available for some trails in MBS NF. Trail use data for NOCA NP, OKWE NF, and for all trails in MBS NF would greatly assist in identifying high use areas that may result in more human-grizzly bear conflicts. Strava (<https://www.strava.com/heatmap#7.00/-120.90000/38.36000/hot/all>) currently has a “heat map” that shows high use trails. This dataset is likely available but could not be obtained for this study and should be further pursued.

- Backyard Farms – Data for goats, chickens, and honeybees were used from the US Census of Agriculture. However, the data represented numbers of farms by county. Data for specific locations of small hobby/backyard farms would help strengthen the conflict locations for this variable.
- Campground Capacity – Campground capacity numbers were not input into all campsite data used and had to be manually entered based on information on the USFS website. However, it is unlikely this information is completely accurate. This capacity number by campground should be entered into GIS data by USFS personnel that have access to this information. Additionally, campground capacity was the best proxy for the number of people that may be present in a campground at one time. However, campsite use (high, medium, low) combined with capacity may be a better measure of potential attractants at a site if this information is available from the USFS.

4.1.2 Core Habitat Analysis

- Trail Use – Usage data for trails was only available for some trails in MBS NF, and were rated as high, moderate, and low use. Trail use data for NOCA NP, OKWE NF, and for all trails in MBS NF would greatly assist in identifying high-use trails that may disturb grizzly bears. A definition of what constitutes a high-use trail must also be created, as there currently is no standard for the NCE.
Strava (<https://www.strava.com/heatmap#7.00/-120.90000/38.36000/hot/all>) currently has a “heat map” that shows high-use trails. This dataset is likely available but could not be obtained for this study and should be further pursued. Alternatively, USFS could update all trail use data to use in this portion of the study.
- Roads – Road data for the Okanogan NF is currently not accurate with some roads classified as “1” still being used by OHV’s. Datasets for both Okanogan and Wenatchee NFs have not been updated for several years and should be revisited in order to make the core habitat analysis estimate more accurate.
- Habitat data – The resulting core habitat layer does not consider whether the areas identified actually provide adequate habitat for grizzly bears. Habitat was previously delineated (Gaines et al. 1994), but this dataset has not been updated since the study to include changes in habitat, particularly burn areas. This dataset should be updated with recent wildfire data (LANDFIRE) and overlaid with the core habitat areas to identify habitat areas that are likely to be used by grizzly bears.

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Appendix A: Figures

Figure 1. North Cascades Ecosystem Grizzly Bear Recovery Zone Location.

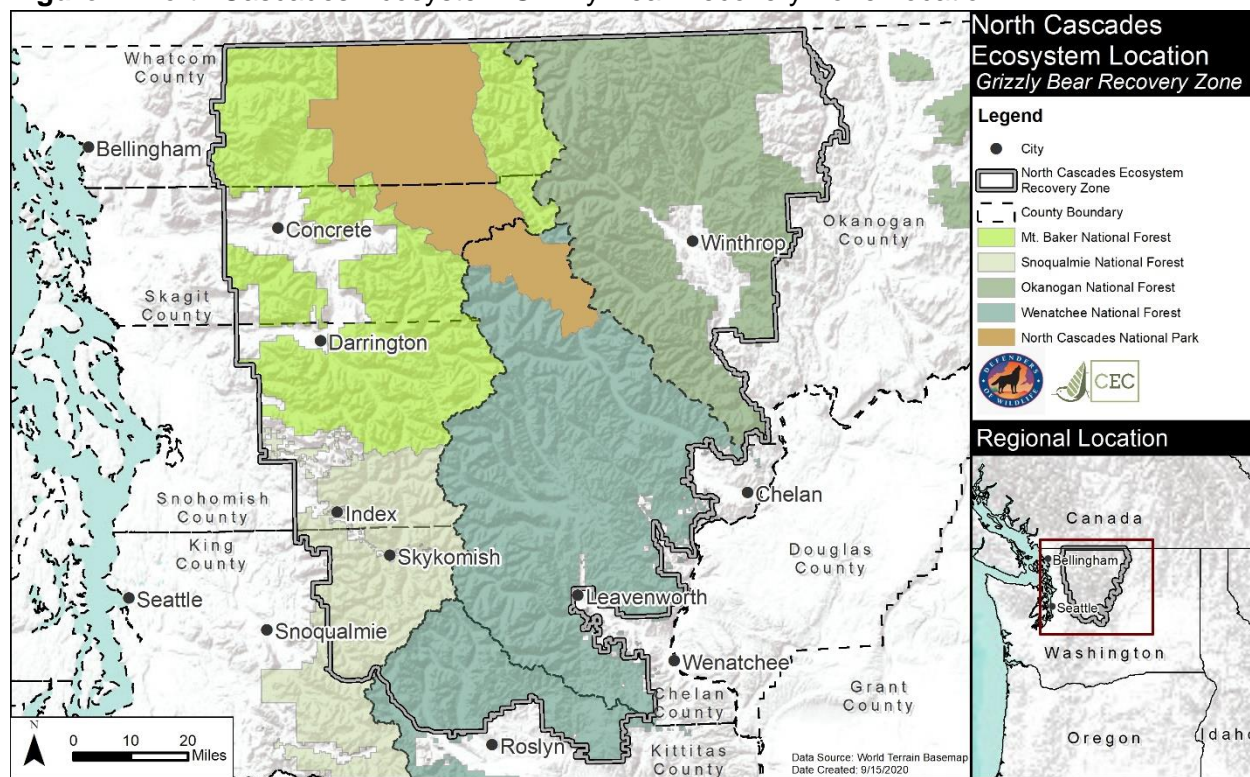


Figure 2. Areas in Need of Grizzly Bear Coexistence Measures in the NCE.

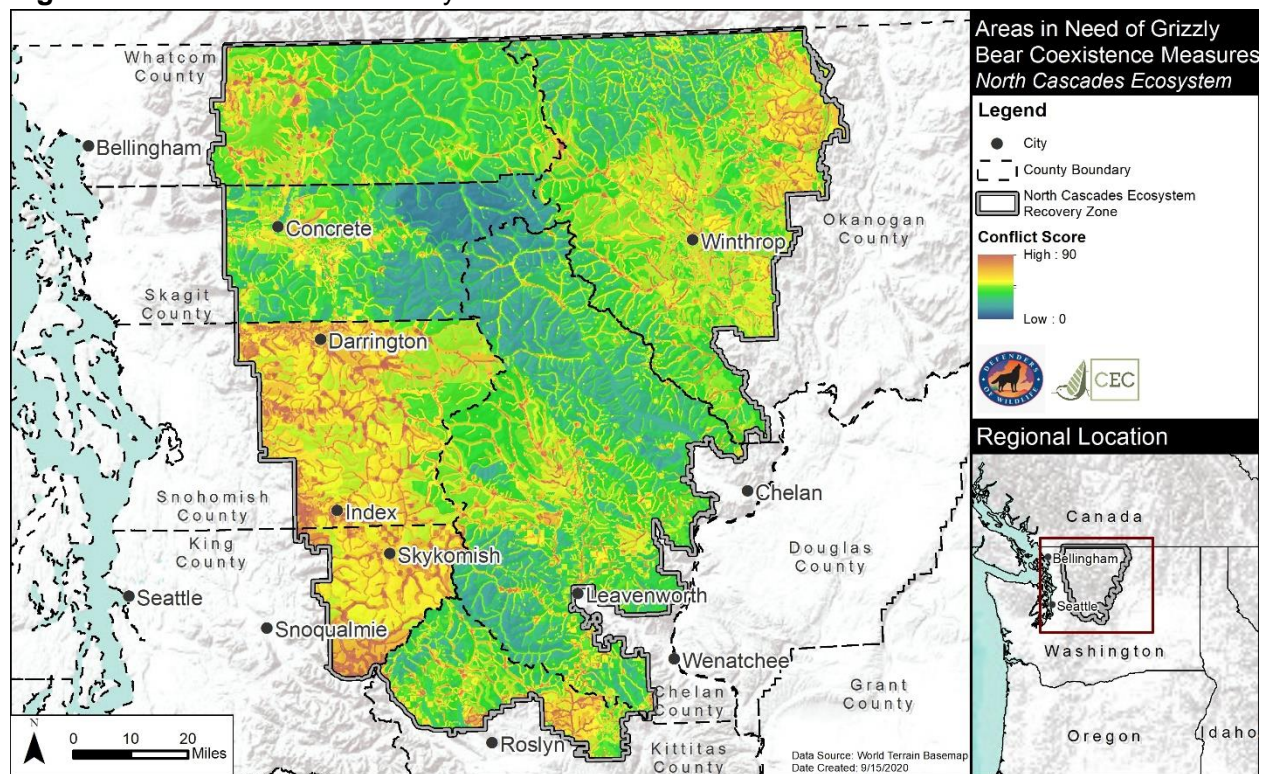


Figure 3. Areas in Need of Grizzly Bear Coexistence Measures by Variable Type.

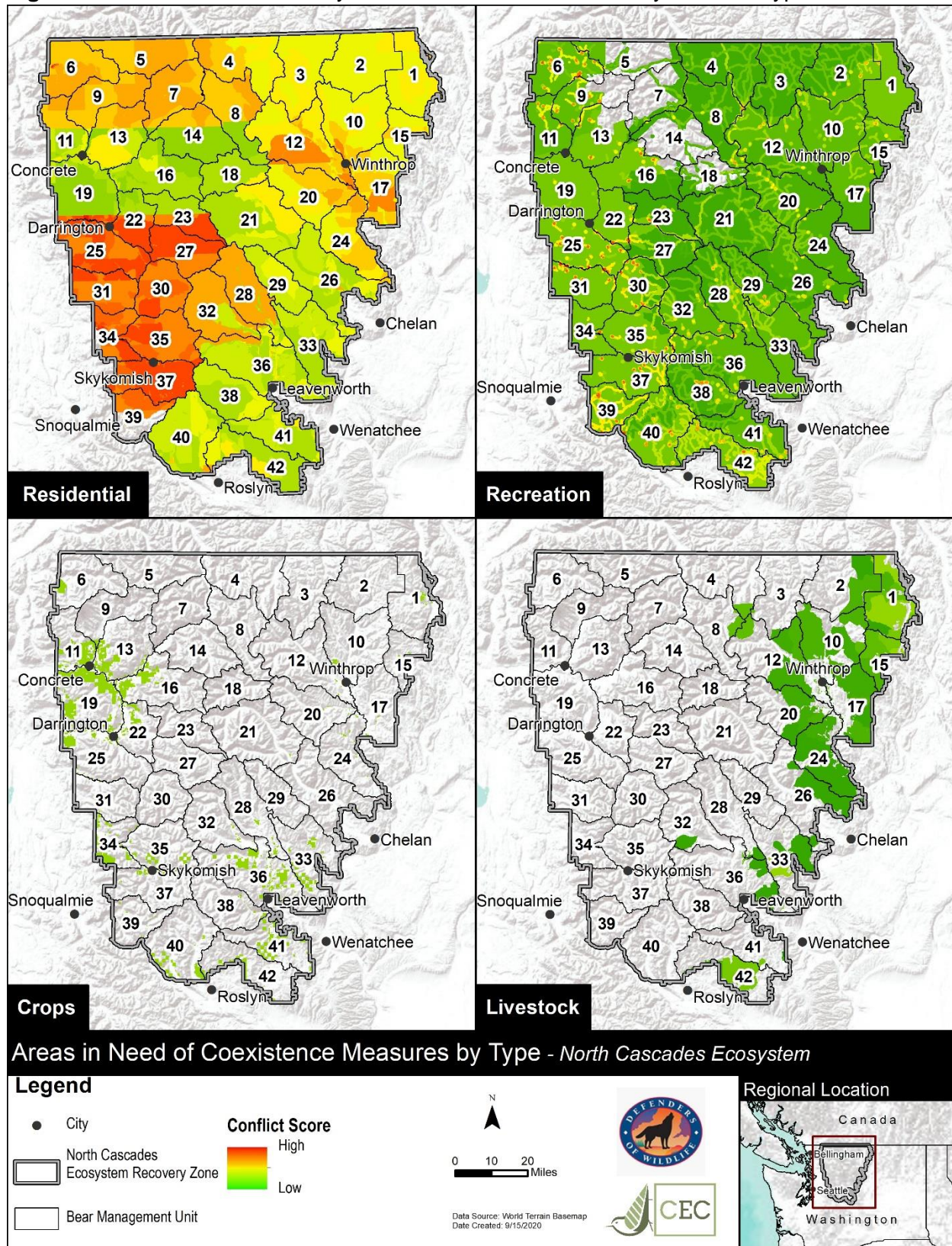


Figure 4. Grizzly Bear Core Habitat for Scenarios 1 through 4 in the NCE (public lands and core habitat areas $\geq 2,500$ acres).

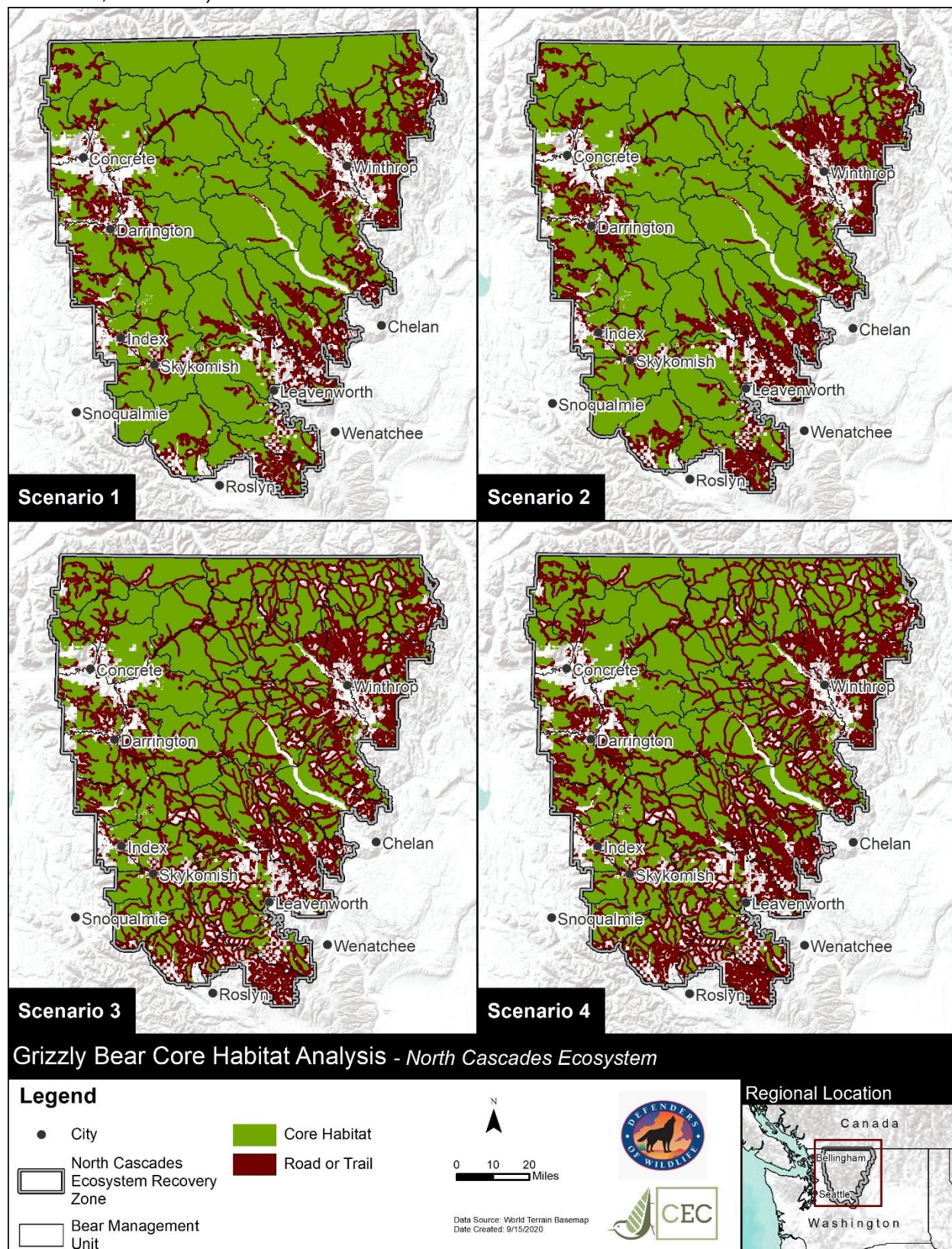
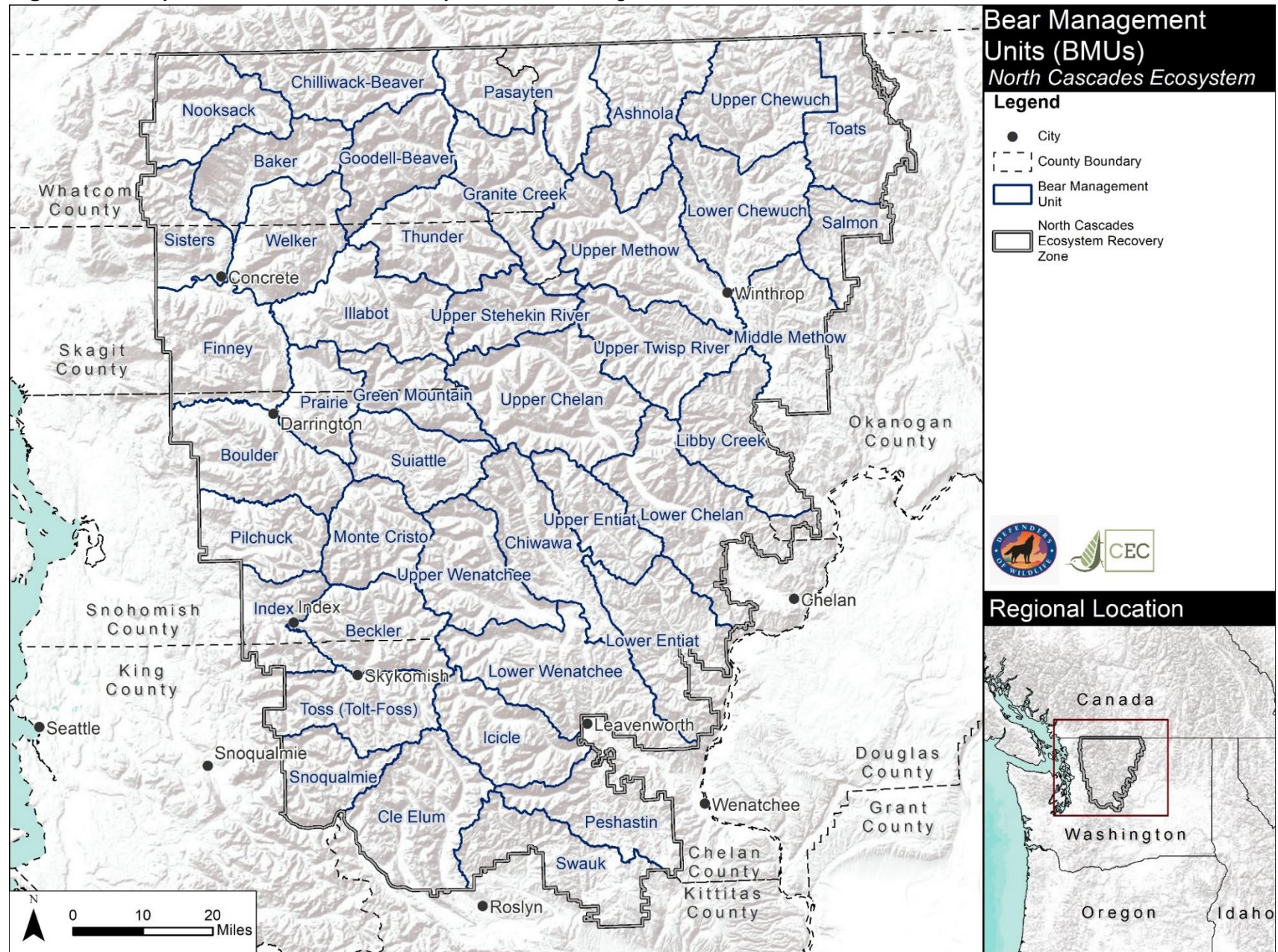


Figure 5. Grizzly Bear North Cascades Ecosystem Bear Management Units.



Appendix B: Human-Grizzly Bear Coexistence

Analysis Data Sources

Human-Grizzly Bear Coexistence Analysis Data Information					
Variable	Data Sets	Source	Description	Model Scoring	
Campgrounds	<ul style="list-style-type: none"> Mt. Baker / Snoqualmie rec sites Okanogan / Wenatchee rec sites North Cascades NP rec sites 	<ul style="list-style-type: none"> Jesse Plumage (USFS) USFS website Anne Braaten (NPS) 	Point location of campgrounds. Buffered by ¼ mile plus an additional 500 m.	<i>Capacity</i>	<i>Score</i>
				4-65	2
				66-160	4
				161-284	6
				285-552	8
				552-1034	10
Crops	WSDA crops – berry farms, vineyards, and orchards	WSDA	Polygon parcel outlines of farms that grow specified crops	<i>Crop Type</i>	<i>Score</i>
				Orchards	9
				Vineyards	5
				Berry Farms	5
Beehives	USDA Census of Agriculture – bee colony number by county	USDA – bee colony number WA State – county outlines	Bee colony numbers by county	<i>Bee colony #</i>	<i>Score</i>
				1-129	2
				130-818	4
				819-834	6
				835-906	8
				907-1110	10
Chickens	USDA Census of Agriculture – Number of farms with <49 chickens by county	USDA – chicken farm number WA State – county outlines	Number of farms with <49 chickens by county	<i>Chicken farm #</i>	<i>Score</i>
				56	2
				57-151	4
				152-166	6
				167-304	8
				305-386	10
Goats	USDA Census of Agriculture – goat number by county	USDA – goat number WA State – county outlines	Goat numbers by county	<i># of Goats</i>	<i>Score</i>
				208	2
				209-613	4
				614-1075	6
				1076-1492	8
				1493-2031	10
Housing Density	US Census Bureau – 2010 Census Data	US Census Bureau	Housing units per census district	<i>Housing Units</i>	<i>Score</i>
				1-14	2
				15-47	4
				48-85	6
				86-127	8
				128-327	10
Hunting	Hunter GMUs	Washington Dept. of Fish and Wildlife – Brock Hoenes	Number of hunter days in 2019 per GMU	<i>Hunter Days</i>	<i>Score</i>
				658-2,274	2
				2,275-4,770	4
				4,771-8,705	6

Human-Grizzly Bear Coexistence Analysis Data Information					
Variable	Data Sets	Source	Description	Model Scoring	
				8,706-12,201	8
				12202-24,540	10
Livestock	Livestock allotment data	Forest Service Geodata Clearinghouse	The number of livestock in the allotment divided by the allotment acreage	<i>Livestock Density</i>	<i>Score</i>
				0.000001 - 0.004974	2
				0.004975 - 0.016087	4
				0.016088 - 0.035101	6
				0.035102 - 0.071965	8
				0.071966 - 0.125418	10
Private Land Pastures	<ul style="list-style-type: none"> NLCD & WSDA pasture data BLM landownership data NLCD forested areas data 	<ul style="list-style-type: none"> Geospatial data gateway WA GIS portal BLM website 	Pastures located on private lands alone and adjacent to forested public lands	<i>Land Type</i>	<i>Score</i>
				Private Land Pasture	6
				Private Land Pasture adjacent to forested public land	10
Other Recreational Activities	<ul style="list-style-type: none"> Mt. Baker / Snoqualmie rec sites Okanogan / Wenatchee rec sites 	<ul style="list-style-type: none"> Jesse Plumage (USFS) USFS website 	Point location of campgrounds. Buffered by ¼ mile plus an additional 500 m.	<i>Type</i>	<i>Score</i>
				Trailhead	8
				Picnicking	10
				Scenic Overlook	4
				Boating	4
				Fishing	6
				Interpretive Area	6
				Winter Sports	6
				Cabins	10
Private Forest Operations	Land use data	Zoe Hanley, Defenders of Wildlife	Polygon land parcels for "Designated forest land under chapter 84.33 RCW" and "Timberland classified under	All Parcels	10

Human-Grizzly Bear Coexistence Analysis Data Information					
Variable	Data Sets	Source	Description	Model Scoring	
			chapter 84.34 RCW		
Rivers and Streams	National Hydrography Dataset	USGS	River and Stream line files that are named. Buffered by 2 km.	<i>Not included due to coverage of entire NCE.</i>	
Roads	<ul style="list-style-type: none"> Mt. Baker / Snoqualmie roads Okanogan / Wenatchee roads North Cascades NP roads Tiger Streets 	<ul style="list-style-type: none"> Jesse Plumage (USFS) USFS website Anne Braaten (NPS) Geospatial Data Gateway 	Road lines buffered by 11 ft for road width, then 500 m for potential conflict area. Tiger streets only used for areas outside of USFS and NPS lands.	All roads	5
Trails	<ul style="list-style-type: none"> Mt. Baker / Snoqualmie trails Okanogan / Wenatchee trails North Cascades NP trails 	<ul style="list-style-type: none"> Jesse Plumage (USFS) USFS website Anne Braaten (NPS) 	Trail lines buffered by 2 ft for road width, then 500 m for potential conflict area	<i>Trail Use</i>	<i>Score</i>
				High	10
				Medium	5
				Low	2
				NA	5
				No Data	0
Wetland & Riparian Areas	<ul style="list-style-type: none"> National Wetlands Inventory (NWI) National Hydrography Dataset (NHD) 	<ul style="list-style-type: none"> USFWS USGS 	Freshwater emergent and forested scrub wetland polygons buffered by 200 m. Named rivers and streams buffered by 200 m.	All wetlands and riparian areas	10

Appendix C: Human-Grizzly Bear Coexistence

Data Summary by BMU

BMU Name	BMU Number	Primary Coexistence Need		Secondary Coexistence Need	
		Category ¹	Type ²	Category	Type
Ashnola	3	Residential	Goats, Chickens	Recreation	Other Recreation
Baker	9	Residential	Chickens	Recreation	Trails
Beckler	35	Residential	Chickens	Recreation	Trails
Boulder	25	Residential	Goats, Chickens	Recreation	Hunters
Chilliwack-Beaver	5	Residential	Chickens	Recreation	Other Recreation
Chiwawa	28	Residential	Housing Density	Recreation	Other Recreation
Cle Elum	40	Residential	Goats	Recreation	Other Recreation
Finney	19	Residential	Chickens	Recreation	Hunters
Goodell-Beaver	7	Residential	Chickens	Recreation	Trails
Granite Creek	8	Residential	Chickens	Recreation	Other Recreation
Green Mountain	23	Residential	Chickens	Recreation	Trails
Icicle	38	Residential	Bees	Recreation	Other Recreation
Illabot	16	Residential	Chickens	Recreation	Other Recreation
Index	34	Residential	Chickens	Recreation	Trails
Libby Creek	24	Residential	Goats, Chickens	Recreation	Other Recreation
Lower Chelan	26	Residential	Bees	Recreation	Other Recreation
Lower Chewuch	10	Residential	Goats, Chickens	Recreation	Other Recreation
Lower Entiat	33	Residential	Bees	Recreation	Other Recreation
Lower Wenatchee	36	Residential	Bees	Recreation	Campgrounds
Middle Methow	17	Residential	Goats, Chickens	Recreation	Other Recreation
Monte Cristo	30	Residential	Goats, Chickens	Recreation	Trails
Nooksack	6	Residential	Chickens	Recreation	Other Recreation
Pasayten	4	Residential	Chickens	Recreation	Other Recreation
Peshastin	41	Residential	Bees	Recreation	Other Recreation
Pilchuck	31	Residential	Goats, Chickens	Recreation	Trails
Prairie	22	Residential	Chickens	Recreation	Hunters
Salmon	15	Residential	Goats, Chickens	Recreation	Other Recreation

BMU Name	BMU Number	Primary Coexistence Need		Secondary Coexistence Need	
		Category ¹	Type ²	Category	Type
Sisters	11	Residential	Chickens	Recreation	Trails
Snoqualmie	39	Residential	Chickens	Recreation	Trails
Suiattle	27	Residential	Goats, Chickens	Recreation	Other Recreation
Swauk	42	Recreation	Hunters	Residential	Goats
Thunder	14	Residential	Chickens	Recreation	Trails
Toats	1	Residential	Goats, Chickens	Recreation	Other Recreation
Toss (Tolt-Foss)	37	Residential	Chickens	Recreation	Trails
Upper Chelan	21	Residential	Bees	Recreation	Trails
Upper Chewuch	2	Residential	Goats, Chickens	Recreation	Other Recreation
Upper Entiat	29	Residential	Bees	Recreation	Other Recreation
Upper Methow	12	Residential	Goats, Chickens	Recreation	Other Recreation
Upper Stehekin River	18	Residential	Bees	Recreation	Trails
Upper Twisp River	20	Residential	Goats, Chickens	Recreation	Other Recreation
Upper Wenatchee	32	Residential	Housing Density	Recreation	Other Recreation
Welker	13	Residential	Chickens	Recreation	Trails

Appendix D: Core Habitat Analysis Data Sources

Grizzly Bear Core Habitat Data Sources			
Variable	Data Sets	Source	Description
Landownership	BLM landownership polygons	BLM website	BLM landownership queried for public lands only
NCE Recovery Zone and BMU	Recovery zone polygon outline and BMU outlines created in 1993 and updated in 2009	Anne Braaten (NPS)	Recovery zone polygon outline and BMU outlines
Roads	<ul style="list-style-type: none"> • Mt. Baker / Snoqualmie roads • Okanogan / Wenatchee roads • North Cascades NP roads • Tiger Streets 	<ul style="list-style-type: none"> • Jesse Plumage (USFS) • USFS website • Anne Braaten (NPS) • Geospatial Data Gateway 	Road lines buffered by 500 m for potential conflict area. Tiger streets only used for areas outside of USFS and NPS lands.
Trails	<ul style="list-style-type: none"> • Mt. Baker / Snoqualmie trails • Okanogan / Wenatchee trails • North Cascades NP trails 	<ul style="list-style-type: none"> • Jesse Plumage (USFS) • USFS website • Anne Braaten (NPS) 	Trail lines buffered by 500 m for potential conflict area. High use trails used from MBS and all trails used for OKWE and NOCA.

Appendix E: Core Habitat Analysis Data Summary by BMU

Grizzly Bear Core Habitat Data Summary by BMU (Percent)

BMU Name	BMU Number	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
		Core Habitat	Roads	Core Habitat	Roads	Core Habitat	Roads + Trails	Core Habitat	Roads + Trails
Ashnola	3	99.0%	0.9%	99.0%	0.9%	63.1%	32.7%	63.1%	32.7%
Baker	9	82.8%	14.9%	81.8%	16.4%	72.4%	24.1%	71.9%	25.5%
Beckler	35	64.7%	25.0%	63.5%	26.2%	54.0%	34.5%	52.7%	35.7%
Boulder	25	61.1%	25.8%	55.6%	31.8%	54.3%	32.6%	48.8%	38.4%
Chilliwack-Beaver	5	98.9%	0.3%	98.9%	0.3%	84.6%	13.3%	84.6%	13.3%
Chiwawa	28	71.7%	23.7%	69.3%	27.3%	47.4%	45.7%	45.6%	48.7%
Cle Elum	40	64.5%	22.1%	58.1%	29.0%	25.1%	53.4%	22.4%	57.5%
Finney	19	29.3%	34.6%	26.5%	36.7%	29.3%	34.6%	26.5%	36.7%
Goodell-Beaver	7	93.4%	6.6%	93.4%	6.6%	82.5%	16.7%	82.5%	16.7%
Granite Creek	8	95.0%	4.5%	90.3%	9.1%	69.1%	30.0%	66.0%	32.0%
Green Mountain	23	95.7%	3.8%	95.6%	3.9%	84.7%	14.6%	84.7%	14.7%
Icicle	38	90.1%	7.4%	88.9%	8.7%	53.1%	39.7%	52.0%	40.9%
Illabot	16	70.4%	12.4%	71.5%	11.4%	68.1%	14.7%	69.2%	13.7%
Index	34	41.6%	18.2%	40.4%	19.5%	40.9%	19.0%	39.7%	20.2%
Libby Creek	24	50.0%	36.8%	50.3%	36.6%	34.7%	47.8%	35.0%	47.5%
Lower Chelan	26	58.1%	28.6%	54.6%	31.4%	43.2%	40.3%	41.5%	42.6%
Lower Chewuch	10	40.6%	49.9%	41.1%	48.9%	30.2%	58.6%	30.4%	57.7%
Lower Entiat	33	28.2%	56.0%	22.2%	64.2%	16.5%	65.2%	10.7%	72.2%
Lower Wenatchee	36	40.3%	28.6%	37.4%	35.2%	20.8%	42.5%	19.1%	48.8%
Middle Methow	17	11.5%	62.8%	11.5%	62.7%	8.7%	64.8%	8.7%	64.7%
Monte Cristo	30	88.1%	10.2%	87.5%	10.8%	60.6%	32.9%	60.2%	33.3%
Nooksack	6	71.7%	23.4%	69.2%	25.9%	61.6%	33.5%	59.1%	35.9%
Pasayten	4	99.6%	0.4%	99.5%	0.5%	70.7%	28.2%	70.7%	28.2%
Peshastin	41	50.0%	26.9%	44.9%	32.1%	25.8%	44.4%	22.0%	48.8%
Pilchuck	31	60.3%	31.9%	58.7%	34.0%	55.7%	36.4%	54.2%	38.3%

Grizzly Bear Core Habitat Data Summary by BMU (Percent)

BMU Name	BMU Number	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
		Core Habitat	Roads	Core Habitat	Roads	Core Habitat	Roads + Trails	Core Habitat	Roads + Trails
Prairie	22	32.9%	46.2%	29.0%	50.9%	29.6%	47.9%	25.8%	52.5%
Salmon	15	34.6%	60.8%	34.6%	60.8%	19.9%	70.9%	19.9%	70.9%
Sisters	11	49.6%	12.1%	50.0%	11.7%	42.7%	18.2%	43.1%	17.8%
Snoqualmie	39	91.2%	7.3%	90.5%	8.1%	58.8%	36.4%	58.2%	37.1%
Suiattle	27	97.7%	2.3%	96.4%	3.6%	78.8%	20.6%	78.8%	20.7%
Swauk	42	43.4%	42.6%	38.5%	47.8%	4.9%	68.8%	4.9%	71.2%
Thunder	14	93.1%	6.9%	93.1%	6.9%	84.5%	15.5%	84.5%	15.5%
Toats	1	40.8%	49.7%	40.8%	49.7%	38.3%	51.7%	38.3%	51.7%
Toss (Tolt-Foss)	37	78.9%	17.9%	78.1%	18.6%	66.0%	29.3%	65.3%	30.0%
Upper Chelan	21	92.2%	3.4%	92.2%	3.4%	65.7%	28.3%	65.7%	28.3%
Upper Chewuch	2	90.6%	9.4%	90.7%	9.3%	57.6%	38.5%	57.7%	38.4%
Upper Entiat	29	79.3%	20.6%	78.0%	22.0%	28.7%	61.1%	25.9%	61.9%
Upper Methow	12	65.3%	21.3%	65.2%	21.4%	49.3%	36.2%	49.2%	36.3%
Upper Stehekin River	18	95.6%	4.3%	95.6%	4.3%	74.8%	24.3%	74.8%	24.3%
Upper Twisp River	20	66.2%	25.6%	66.2%	25.6%	38.1%	50.0%	38.1%	50.0%
Upper Wenatchee	32	77.4%	18.2%	75.1%	20.4%	56.8%	36.5%	54.7%	38.6%
Welker	13	68.0%	10.0%	66.0%	12.0%	63.9%	13.5%	61.9%	15.4%

Percent by Scenario calculation only includes public land and core habitat areas ≥2,500 acres.

NORTH CASCADES ECOSYSTEM SUBCOMMITTEE

Interagency Grizzly Bear Committee

Spring Meeting 2020

9 June 2020, 9:00am – 12:00pm

Subcommittee

Kristin Bail (USFS, chair)
Karen Taylor-Goodrich (NPS)
Hilary Cooley (USFWS)
Gregg Kurz (USFWS)
Brendan Brokes (WDFW)
Nichole Branton DFS
Jody Wiel FS MBS

Other Participants

Monte Kuk (USFS)

Audience

Chris Morgan – Ecologist, filmmaker
Robb Krehbiel – Defenders of Wildlife, NW Rep.
Graham Taylor – National Parks Conservation Association

Technical Team

John Rohrer (USFS, chair)
Anne Braaten (NPS)
Jesse Plumage (USFS)
Melanie Percy (BC PMECCS)
Wayne Kasworm (USFWS)
Cailyn Glasser – Okanagan Nation Alliance
Scott Fitkin (WDFW)

Information and outreach

Lori Roberts

Review of Notes from November 2019 meeting

- No comments, accepted as recorded.

Update from North Cascades National Park - Karen Taylor-Goodrich

- The Draft EIS process was shared up to date, including results from the additional 90-day comment period that ended in October 2019 which included public, individual and group meetings, and tribal consultation. Cooperators include the USFS and USFWS. The North Cascades National Park is currently waiting for further direction from NPS and DOI on next steps.

Update from US Fish & Wildlife Service – IGBC Recovery Wayne Kasworm/

- The Selkirk, Cabinet-Yaak Subcommittee met in May.
- Adjustments are being made to the research effort due to the associated impacts of the COVID-19 pandemic. Trapping and radio collar samples will take place this year. There will be an abbreviated effort in the Selkirk and Cabinet-Yaak units in 2020.

Hilary Cooley – US Fish & Wildlife Service

- Following the delisting in the Greater Yellowstone Ecosystem, then overturned in 2018, there are several pending lawsuits, and it's been appealed to the 9th Circuit. Oral hearings took place in May 2020, and they are now waiting for an opinion, the timing of which is unknown. This will impact the recovery decision for the GYE.
- The agency is currently undergoing a Five-year review for grizzly bear. The last one was completed in 2011. The status of all six ecosystems will be evaluated in the lower 48 states to review the state of recovery efforts ensure the current listing is still valid. A draft will go out for peer review in July 2020 and any recommendation to change a listing would go out to the public for comment and involvement.

Update from WA Department of Fish & Wildlife - Brendan Brokes

- Personnel updates. Jim Brown is retiring; Andrew Murdock will take his place. Penny Becker moved on, Hanna Anderson took her place.

Update from Mt. Baker-Snoqualmie National Forest - Nicole Branton

- MBS has been focused on the COVID 19 situation and developing mitigation measures to conduct work safely. All field going folks will be able to do field work.
- From Jessie MBS is moving ahead with a forest-wide food storage order. (in the front country) using the Colville as a template. Will keep the group informed of progress.

Update from Okanogan-Wenatchee National Forest - Kristin Bail

- Alliance for Wild Rockies Litigation update – Litigating decision on the Mission Restoration project on Methow Valley Ranger District; includes points regarding grizzly bear analysis. Process is still proceeding. Hearing for a stop motion is November 10th in Spokane – we are working through the process, navigating the issues raised.
- Effective October 1st, Tonasket Ranger District will be administered by the Colville NF. Rodney Smolden is the Forest Supervisor. Currently working on staffing shifts to ensure ongoing work continues. District boundaries will remain the same, however the Okanogan-Wenatchee will be the point of contact for the Pasayten wilderness.
- We are working through our approach to travel management toward a draft decision. We need to re-engage public and consider the path forward, including whether to align Tonasket district with the Okanogan-Wenatchee or the Colville.
- Forest Plan Revision – our regional office is doing a bio-regional assessment to consider the Northwest Forest Plan; ongoing discussions on how best to fund and schedule forest plans.

Update from the Okanogan Nation Alliance (ONA) - Cailyn Glasser

- ONA declared a resolution joint grizzly bear recovery group. We've been working since 2014 to reestablish interim measures to implement recovery actions. Habitat suitability mapping was done in 2017. Ongoing efforts to carry out habitat assessments in Skagit Valley and the North Cascades, and to design and complete a recovery plan in North Cascades by the end of 2021.

Update from British Columbia Parks - Melanie Percy

- Bear success is a priority. Efforts and funds have been invested in public education; bear-proof cooler cages; attractive management; bear hazard assessment. Making plans to redevelop facilities following a 2018 wildfire. Wild-safe coordinator would do outreach on ground when bears return to the area. Will not be talking about restoration or reestablishing bears, just discussing habitat and safety with visitors.
- Question about moving or augmenting population in Garibaldi or Stein-Nahatlatch - - the plan is to start moving bears late 2020 season – yet to be confirmed. Will keep updated.
- Remote camera study of citizen scientists looking for wildlife signs – no bears yet, but hopeful.

Western Wildlife Outreach Update – Lorna Smith

- Did not join the call today. No report.

NCE Action Plan – 2020 Planned Actions and 2021 Proposed Actions

Goal #1: Establish and implement clear direction for recovery

- no action for 2020; 2021 to be determined.

Goal #2 Maintain or enhance habitat conditions for grizzly bears

Objective #1 - Reaffirm forest no-net loss policy. In progress. *Status*: having issues regarding how we calculate core areas; BMU boundaries not matching on National Park-National Forest boundary,

definition of restricted roads, minimum core area size, private and state land road layers, and how to treat admin closures, and the increase in high-use nonmotorized trails. There is a need for more work.

- ◆ Defenders of Wildlife effort to promote recovery (Zoe Hanley, NW Representative):
 - Contracted out two analyses. 1) Developing a human/bear hotspot conflict map (projection) to work with communities and partners to reduce conflicts
 - 2) Using best available data to identify core areas and security habitat, including public lands road layers, private lands road layers, and non-motorized trails. Timeline to complete both is September 30, 2020. USFWS would like to include more road layers. Consultant will hold off until Aug 15 to complete the hotspot map. We will build on previous information with updates. We will continue to advocate for grizzlies in the North Cascades
- ◆ Monte Kuk/John Rohrer presented and discussed a 2-page document they had prepared that summarized the issues of core area calculations on the Okanogan-Wenatchee and the large North Cascades RZ (attached).
- ◆ The NC Subcommittee Tech Team (multi-agency) needs to discuss and make recommendations to the Subcommittee on how to resolve these issues. Not having updated data will affect the quality level; data input by the tech team to make a recommendation is critical.
- ◆ Some of the estimated times in the table may be ambitious and may take a bit more time to resolve than stated in the chart.
- ◆ The OWNF roads layer is possibly not fully accurate; the Forest needs to work on this prior to giving to DW. It may not be possible for them to present their data by August 15. This may need to be rolled into a 2020 commitment. It was noted that the Forest hopes to provide synergy through the 2020 program of work.
- ◆ Scott Fitkin (WDFW) Lynx trail camera studies – offers that there's quite a data set that could be utilized beyond the lynx component that could be helpful in evaluating the high-use nonmotorized trail issue.
- ◆ DW has offered to use best available data; they're willing to examine high use nonmotorized trails vs. minimum core size and make recommendations for those.
 - A literature search was proposed; there is agreement a literature search has value and would be a reasonable effort.
 - Based on the discussion, sounds like it warrants a tech team meeting in near future; include the DW data; need a proposal from the tech team with a clear understanding of what's needed to produce a clear data set, and time investment needed.
 - A tech team meeting will be set up asap to make recommendations about what we can do this year, and what needs to be postponed to 2021.
 - Noted: Need to add a column the NCE Action Plan for "Fiscal 21 Plans"

Objective #2: Develop a bear sanitation database

- NPS has updated; there is an ongoing effort to purchase bear food storage and waste receptacles each year; OWNF continues to maintain current database

Objective #5: to increase available of food storage and waste receptacles annually:

- We will continue to install refuse and food storage facilities. Upper Methow Valley efforts to continue for obtaining/purchasing containers for black bears. Also, looking at commercial

dumpsters, and may be seeking some funding from the committee. Want to expand this and use as a model for other areas.

- NPS had setback on replacing food storage locker on Ross Lake - - not enough water to barge them in. An incoming order would complete for Highway 20 and Stehekin Valley. Close to completing all.
- MBS: most of our developed rec areas have bear dumpsters (mailbox style). We are always looking for more dumpsters.
- OWNF –Entiat, Chelan, Tonasket, Methow Valley all good. Currently issues with styles vs. capabilities of local waste service (rear loading vs. front loading dumpsters). Methow Valley Ranger District will need all front-loading dumpsters next year to be in sync with waste company's new truck.

Objective #3 – standard sign language by 2022. IGBC has a standard sign OWNF is using to replace old ones.

Objective #4 – expand food storage orders by 2022.

- MBS moving toward a food storage order; NPS has them; OWNF does not have animal resistant dumpsters in all their campgrounds yet; need to have those before we require the public to adhere to requirements to be compliant.

Goal 3 - Document presence of Grizzly Bears

Objective #1 (the only objective): verify reports of GB reports as soon as practical.

- “May be present” maps (FWS)– Hilary: Section 7 Consultation – mapping where GBs may be present and when to consult. Trying to make it consistent, working on a protocol for our offices. Gregg: based on confirmed sightings in ‘recent’ past (15 years) to indicate where GBs may be present. “No net loss” habitat guideline may still have to be maintained even if no reported sightings. Bitterroot Recovery Zone is trying to figure this out. Need to make distinction between “may be present” or possibly present. Will still require consultation. Would focus on how we are maintaining habitat.
- Salmon poisoning - there are tests done on bear blood to look for agents - - may not be as big a deal for grizzlies. Some black bears affected but may have developed immune responses to deal with this. Studies did not indicate (based on samples sent in) that there were major issues.

Commitments:

- We will take what we learned today and update the NCE Action Plan spreadsheet
- Will finalize the spreadsheet in September prior to sending in to IGBC for annual winter meeting.

Public Comments

- Chris Morgan – Expressed appreciation for our work. Offers support. Chris is an ecologist and filmmaker. Has made a few short films, podcasts about the GB on their plight and recovery. Repledging commitment to the recovery process. Offering help and support, especially around storytelling and information. Will send links to this group to share his work on conservation.
- Rob Krehbiel – NW Rep with Defenders of Wildlife – expressed appreciation to the staff for cooperation, and dialoguing with defenders. Stressed the importance of this project to provide an informative picture of what GB habitat looks like. Requests:
 - ♦ Let Defenders assist with cost-share on containers as they can

- ♦ Consider fencing dumpsters
- ♦ We hope to facilitate some of this dialogue during our bear defenders workshop – in person and online being considered as format; more details to come out soon
- ♦ Working on trash situation in Methow Valley. Also working with the Sauk tribe on this project as well.
- ♦ The organization has done bear spray training – both online, and in person. Focusing on Latino public land users. Also sharing about bear awareness.
- ♦ Installed a wind electric fence, second project – let us know if interest in participating in field trips.
- ♦ Bear awareness workshops done at the North Cascades Institute. Also considering Sedro Wooley location. Rob will send a link to a zoom training on bear awareness that was recorded. Also, some short clips on the IGBC website. Will also share bear awareness short video's - they are purely educational with no advocacy for DoW.
- Graham Taylor – thank you for efforts and making investment in time on GB recovery. The National Parks Conservation Association – have been pivoting to talks online for educational purposes – good feedback and support.

Any other business we need to cover in future?

- No other business brought forward from the sub-committee
- NCE Tech team has been tasked to identify work for FY 21

~Meeting Adjourned~