BRITISH COLUMBIA

Ministry of Forests, Lands and Natural Resource Operations

Grizzly Bear Use of Whitebark Pine

South Chilcotin, British Columbia

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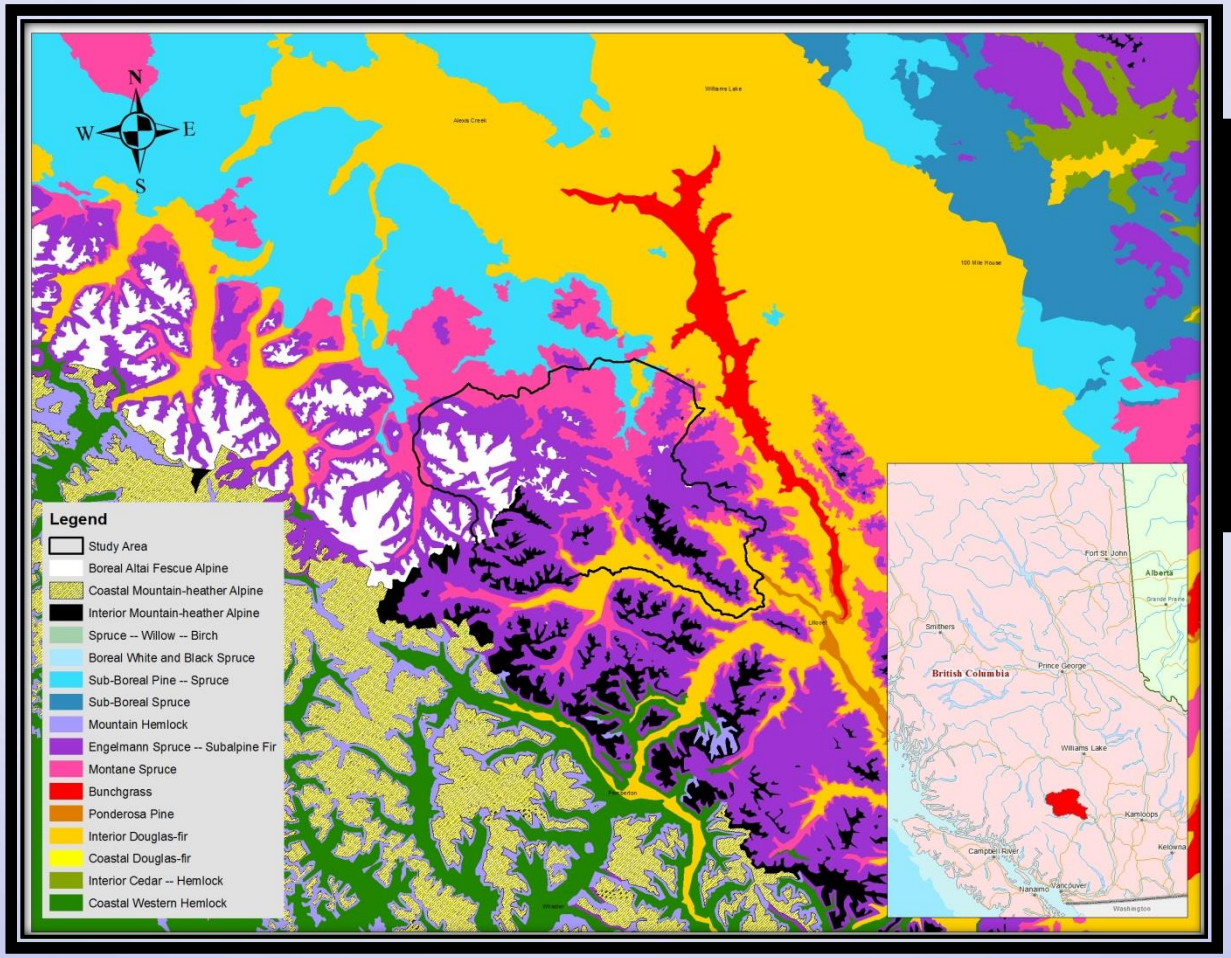
Talk Overview

- Project Objectives
- Study Area
- Methods
- Bear Physiology and Whitebark
- Preliminary Results
- Summary/Questions
- Acknowledgements

Project Objectives

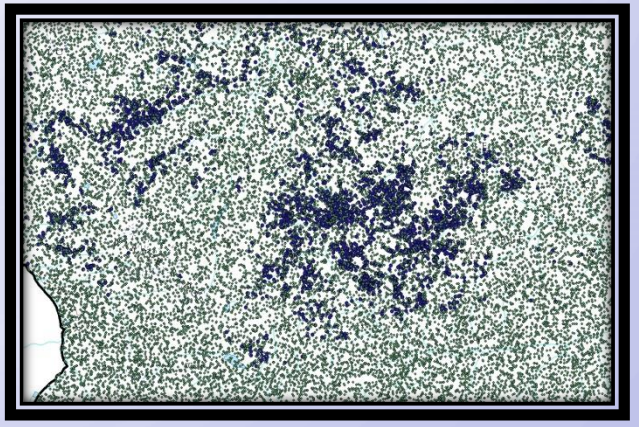
- Identify grizzly bear seasonal home ranges and important habitats;
- Assess inter-annual variation in regard to movement and selection patterns;
- Determine seasonal and spatial variation in diet;
- Raise awareness and communicate information on grizzly bear management and recovery to the public.

Study Area

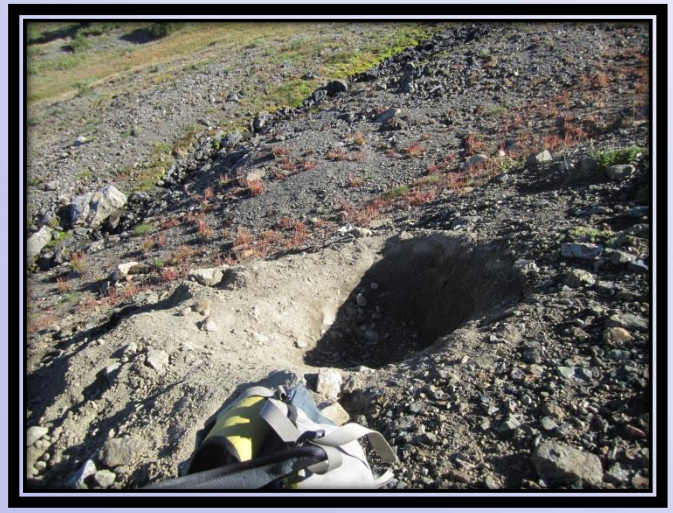

N
W
E
S
Legend
Study Area
Boreal Altai Fescue Alpine
Coastal Mountain-heather Alpine
Interior Mountain-heather Alpine
Spruce -- Willow -- Birch
Boreal White and Black Spruce
Sub-Boreal Pine -- Spruce
Sub-Boreal Spruce
Mountain Hemlock
Engelmann Spruce -- Subalpine Fir
Montane Spruce
Bunchgrass
Ponderosa Pine
Interior Douglas-fir
Coastal Douglas-fir
Interior Cedar -- Hemlock
Coastal Western Hemlock
Williams Lake
Alexis Creek
100 Mile House
Fort St John
Alberta
Smithers
British Columbia
Prince George
Williams Lake
Kamloops
Campbell River
Kelowna
Nanaimo
Vancouver
Washington

Methods

- Bears immobilized from helicopter
- Bears fitted with a Iridium Satellite tracking collar – rot off
- 2 hour fix interval; last for 2 years
- Resource Selection Functions (Spring-Fall) (Program R)
- Home Range Tools



Methods



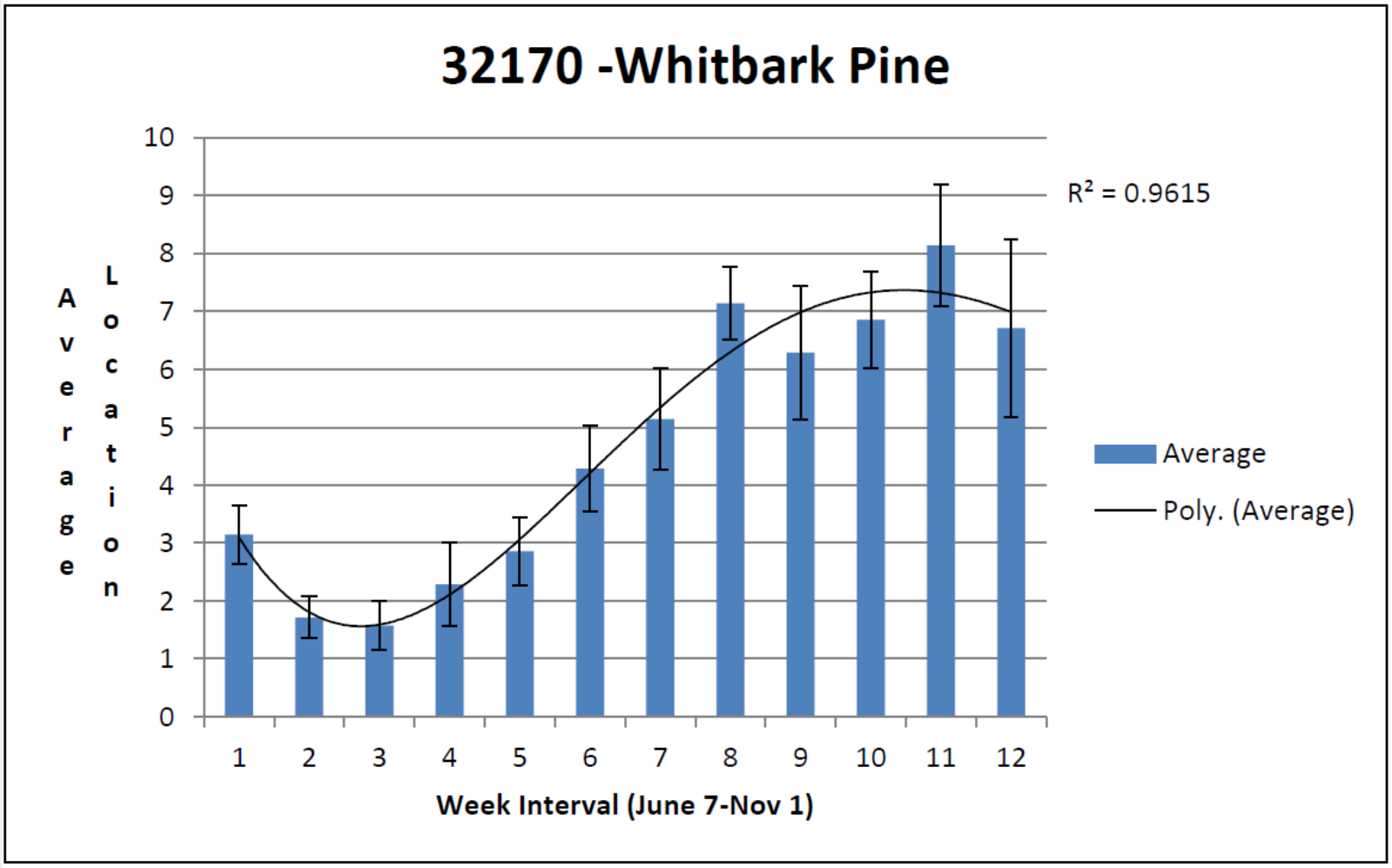
Fine Scale Habitat Use

- Bear spatial patterns are heterogeneous
- More time spent at location the greater the selection
- Use vs Random plots done throughout the bear seasons
- Other biological samples collected include hair and scat

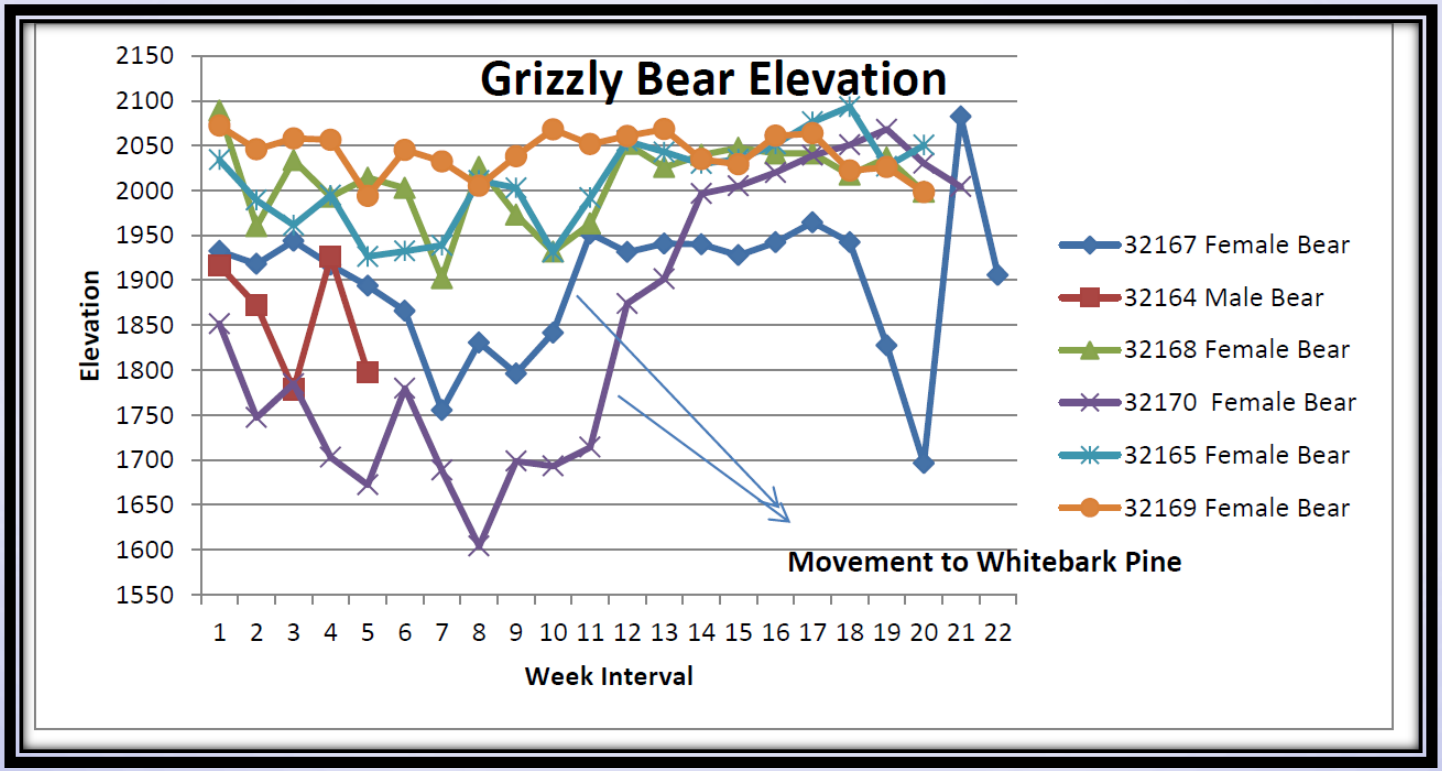
Bear Physiology and Whitebark

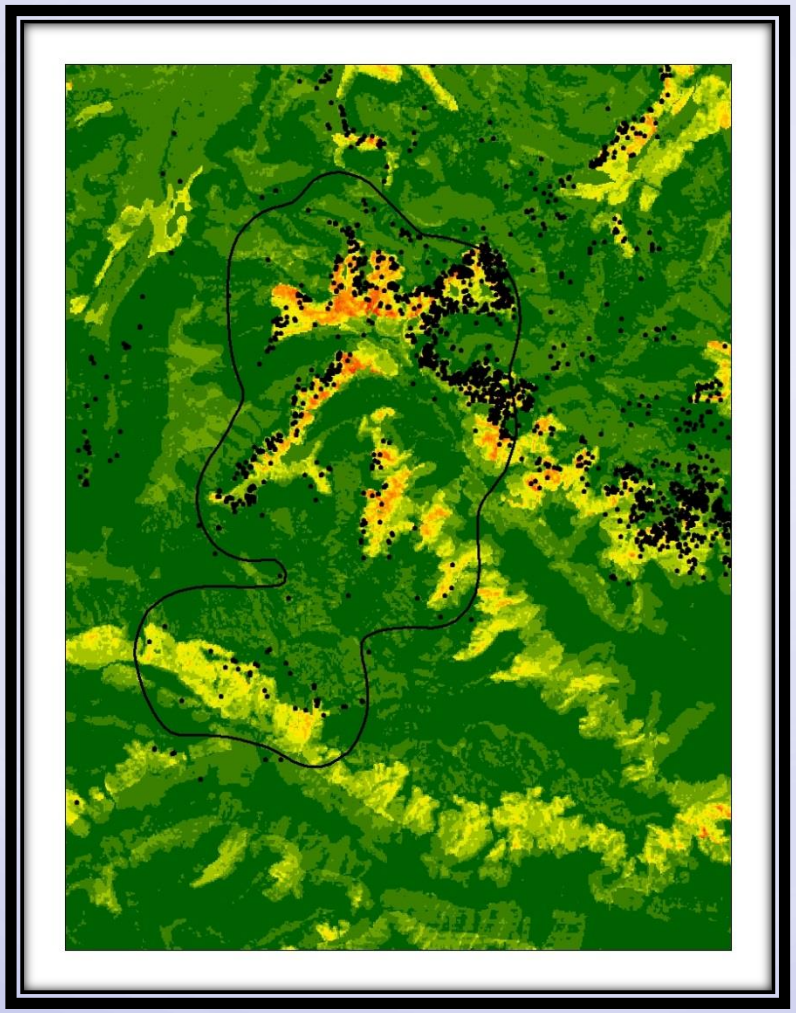
- Fall is a critical time period for Grizzly Bears 20,000 kcal per day
- Bears gain 3-4 lbs a day
- Whitebark Pine - high-fat content and moderately high digestibility
- 52% fat, 21 % carbohydrates, and 21% protein (Lanner and Gilbert 1994)
- Studies note bears can feed up to 20 hours per day (Nelson 1983)

Photo Credit: Bruce McLellan


32170 -Whitbark Pine
Average Location
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
Week Interval (June 7-Nov 1)
R² = 0.9615
Average
Poly. (Average)

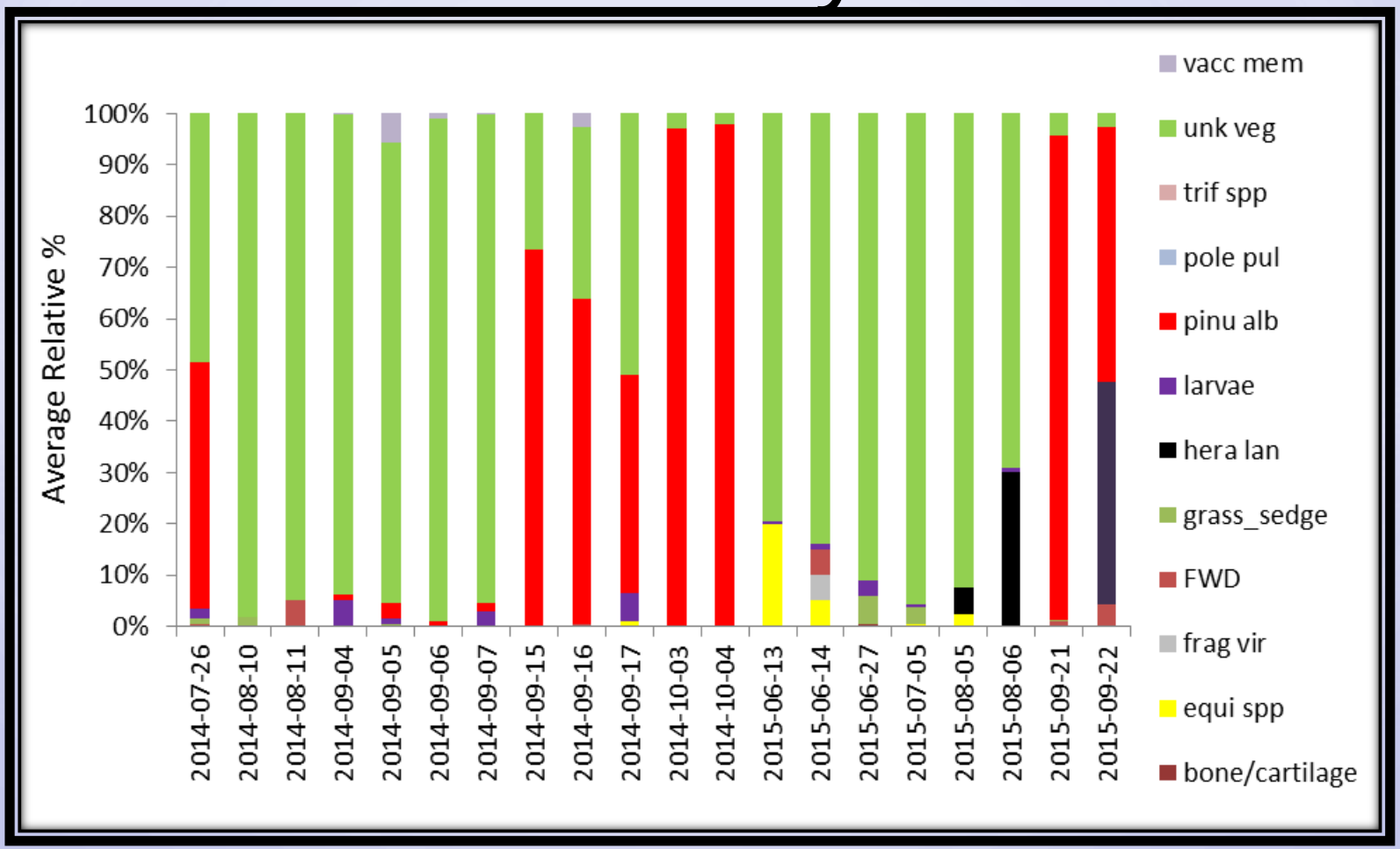
Elevation


Grizzly Bear Elevation
Elevation
2150
2100
2050
2000
1950
1900
1850
1800
1750
1700
1650
1600
1550
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
Week Interval
Movement to Whitebark Pine
32167 Female Bear
32164 Male Bear
32168 Female Bear
32170 Female Bear
32165 Female Bear
32169 Female Bear

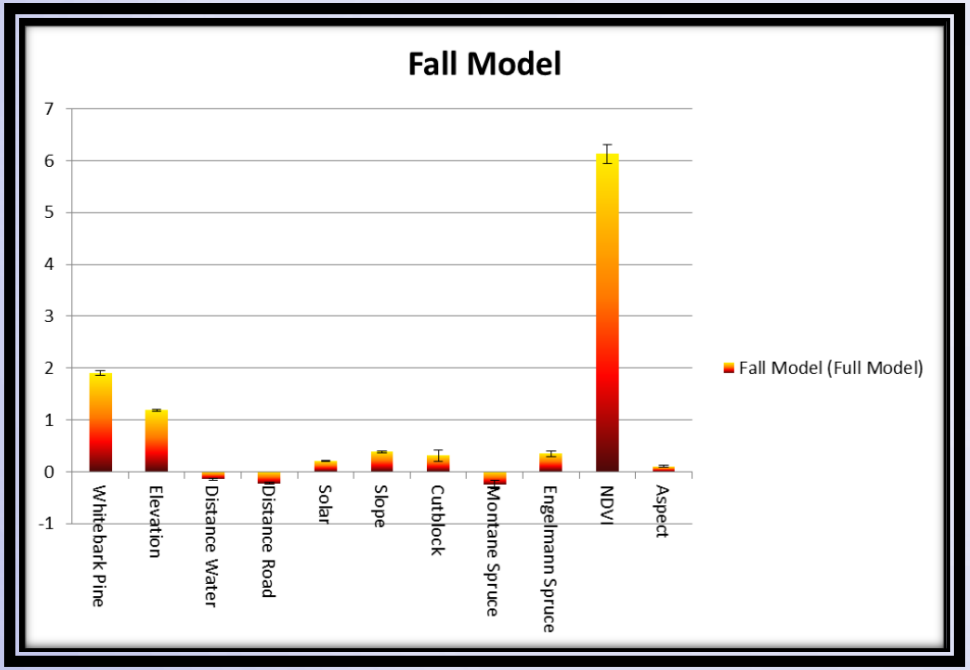


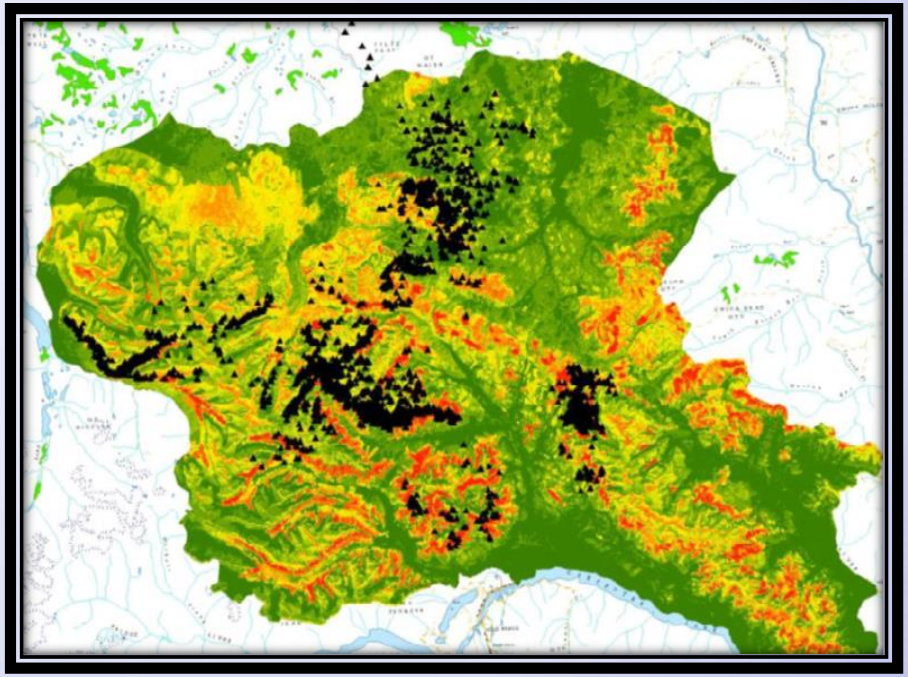
Core Seasonal Range
90% Kernel
Fall home range
66km^2
Last image addition of Fall Bear Locations

Scat Analysis



Fall Resource Selection Function





Links to Management

- Thompson Region has invoked measures under the *Wildlife Act* to prohibit off road vehicles into Alpine areas (e.g. Shulaps).
- Thompson Region is working on GAR orders to protect important Grizzly Bear seasonal habitats, including Whitebark Pine.
- Beneficial to establish link with Whitebark Pine masting cycles and Grizzly Bear reproduction
- Consider using controlled fire as agent of disturbance to promote Whitebark Pine
- Continue with blister rust surveys long-term plots
- Use mixed models by bear to look at WBP coefficients
- Characterize squirrel middens that are used and adjacent habitat
- Consider silviculture plantings to maintain squirrels
- Collect Cones from High Infection Areas (Moody 2016)
- Protect larger Whitebark trees (Moodey 2016)

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Citations: Nelson, R.A., Folk, G.E., Pfeiffer, E.W., Craighead, J.J., Jonkel, C.J., and Steiger, D.L. 1983. Behavior, biochemistry, and hibernation in black, grizzly, and polar bears. International Conference on Bear Research and Management 5:284-290
Lanner, R.M. and Gilbert, B.K. 1994. Nutritive value of whitebark pine seeds, and the question of their variable dormancy. In: W.C. Schmidt and F.K. Holtmeier (eds), Proceedings of the International workshop on subalpine stone pines and their environment: the state of our knowledge. Gen. Tech. Rep. INT-GTR-309., pp. 206-211. Ogden, UT.; Moody, R. 2016. Whitebark Pine Restoration Project. 16.W.SON..02. Fish and Wildlife Compensation Program