

A photograph of a grizzly bear standing in a dirt clearing. The bear is dark brown and is looking towards the camera. Behind the bear is a large, blue metal cage with a green mesh door. The background consists of dense green trees and foliage. The text is overlaid on the top half of the image.

# **Fine Scale linkages and conservation delivery for grizzly bears**

**Michael Proctor  
Wayne Kasworm  
Grant MacHutchon  
Tom Radandt  
Chris Servheen**

**Grizzly bears use many habitat types  
that overlap many species  
a good umbrella species**

**If grizzly bears are doing OK then many types  
of habitats that support many species  
are likely doing OK**

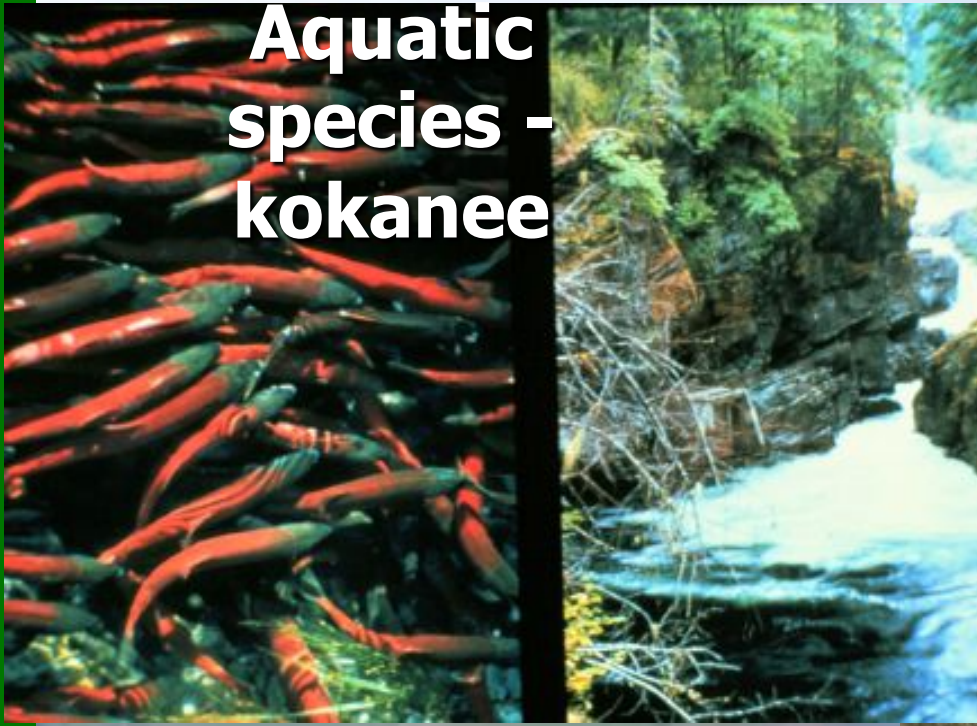
**Grizzly bears - one of the most sensitive species  
a good indicator species**



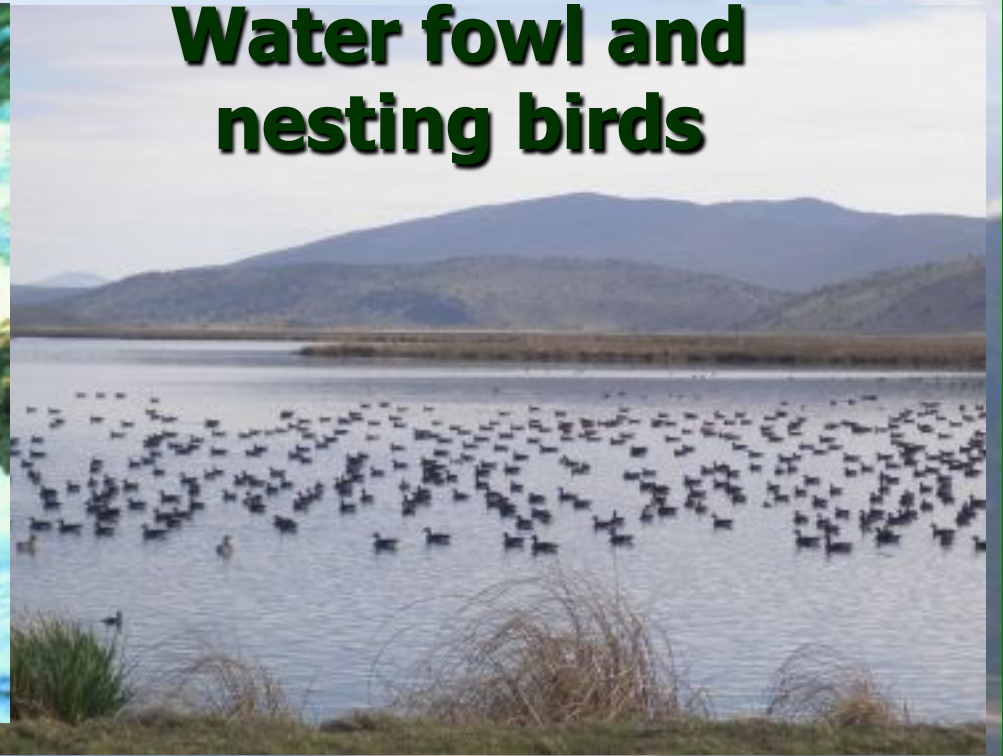
# South Selkirk “Kirk”



**Aquatic  
species -  
kokanee**



**Water fowl and  
nesting birds**



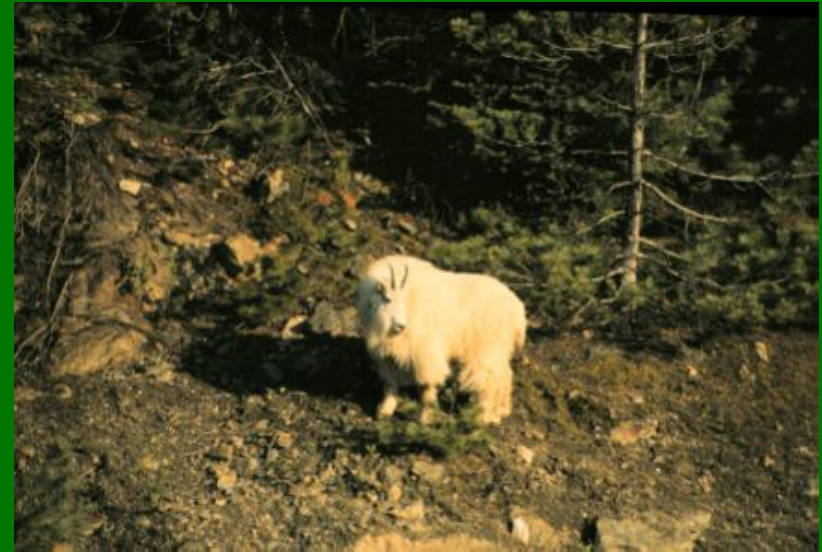
**Reptiles**



**Amphibians**



# Ungulates



# Predators



# High elevation habitats





# WILDLIFE MONOGRAPHS

Vol. 90, January 2002



**THE PROBLEM**

## Population Fragmentation and Inter-Subspecies Movements of Grizzly Bears in Western Canada and the Northern United States

Michael P. Branch, David Johnston, Bruce W. Milligan, James W. Stinson,  
Katherine G. Harrod, Richard G. Jelic, Wayne J. Knapik, Christopher Johnson,  
John L. Lanyon, William L. Stapp, Wayne L. Mackintosh, Bruce A. Patterson, Scott Wilson,  
Stephen W. Apple, James M. Stenseth, Richard M. H. Thompson, Bruce W. Stapp,  
Thomas J. McCarthy, David Johnston

Published by The Journal of Wildlife Management



# Grizzly bear linkage area identification using GPS telemetry and habitat modeling in the fragmented trans-border region of southern British Columbia and northern Montana and Idaho

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**Grizzly bear linkage enhancement plan for  
Highways 3 & 3A corridors in the south Purcell and Selkirk  
Mountains of British Columbia**



Researched and prepared by  
**The Trans-border Grizzly Bear Project**  
Michael Proctor<sup>1</sup>  
Chris Servheen<sup>2</sup>  
Wayne Kasworm<sup>3</sup>  
Tom Radandt<sup>2</sup>

**IMPLEMENTATION**

<sup>1</sup> Decidule Ecological  
PO box 806 • Hazelton, BC • V0G 1M0 • Canada • mproctor@telus.net  
<sup>2</sup> US Fish and Wildlife Service - College of Forestry  
and Conservation, 309 University Hall, University of Montana, Missoula, MT 59812, USA  
<sup>3</sup> US Fish and Wildlife Service  
475 Fish Hatchery Road, Libby, MT 59923, USA

**March 2008**

**Pedigree analysis to assess and monitor functional connectivity of grizzly bears in the trans-border region of northern Montana, Idaho, Washington, and southern British Columbia**



**Michael Proctor, Birchdale Ecological  
Wayne Kasworm, USFWS  
Wayne Wakkinen, Idaho Fish & Game  
Chris Servheen, USFWS**

**Prepared for  
Great Northern Landscape Conservation Cooperative  
Liz Claiborne Art Ortenberg Foundation  
Wilburforce Foundation  
Habitat Conservation Trust Foundation  
Columbia Basin Fish Wildlife Compensation Program  
National Fish and Wildlife Foundation  
Yellowstone to Yukon Conservation Initiative**

**December 2012**

# WILDLIFE MONOGRAPHS

Vol. 90, January 2008



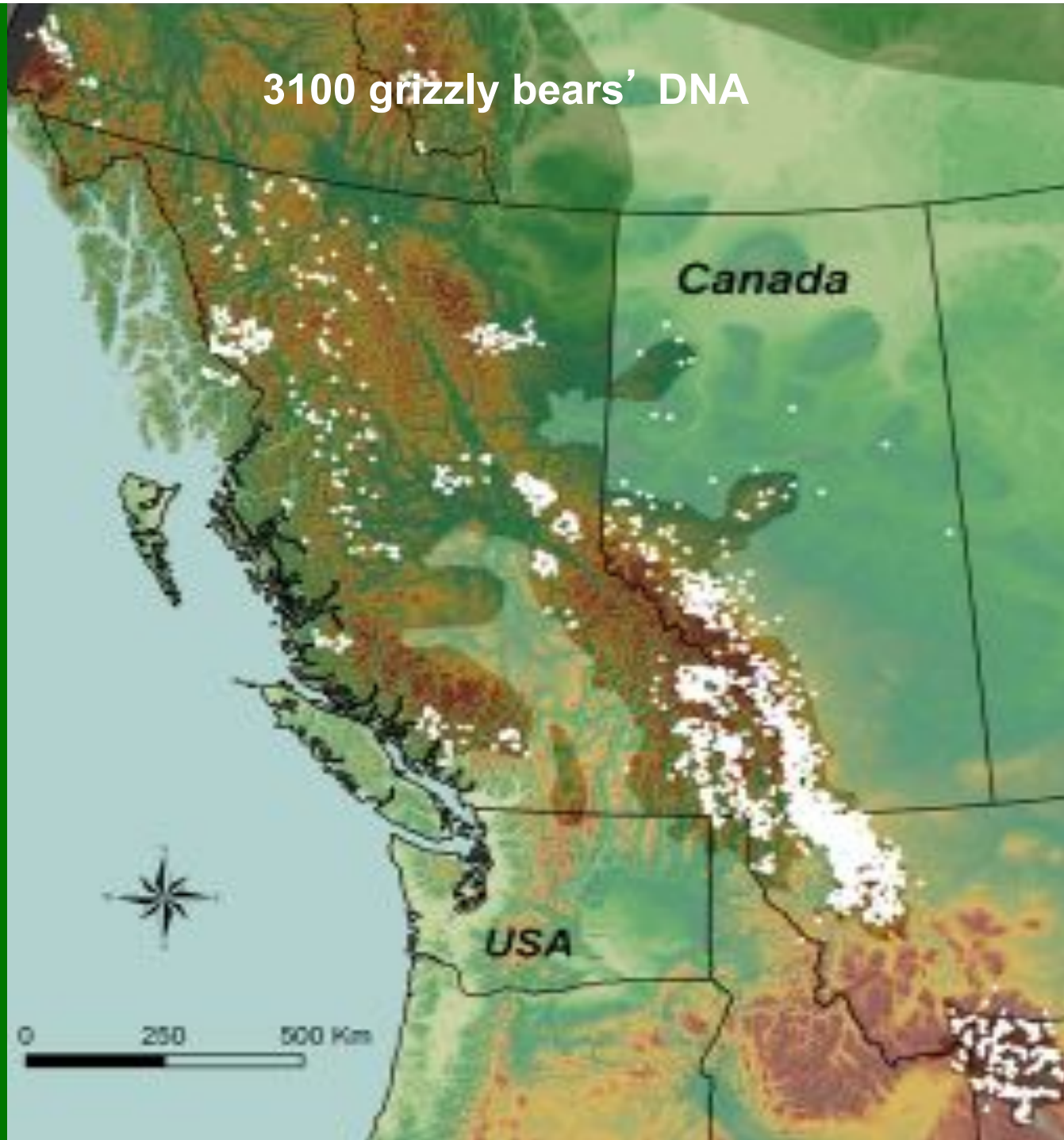
## Population Fragmentation and Inter-population Movements of Grizzly Bears in Western Canada and the Northern United States

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Thomas G. Kochanski, David Stenseth

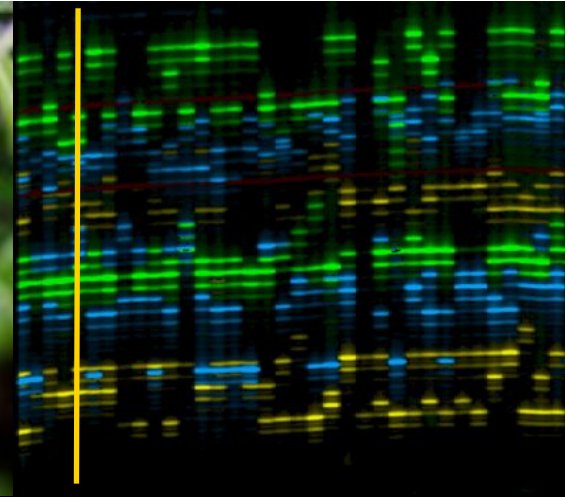
Published by The Journal of Wildlife Management



# 3100 grizzly bears' DNA



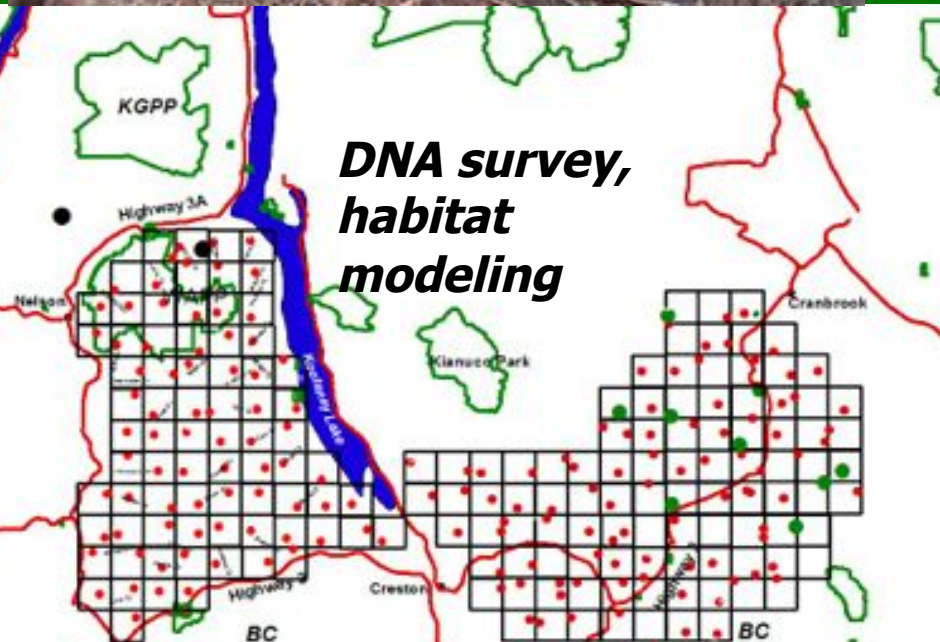
## DNA sampling



Population estimation

Fragmentation

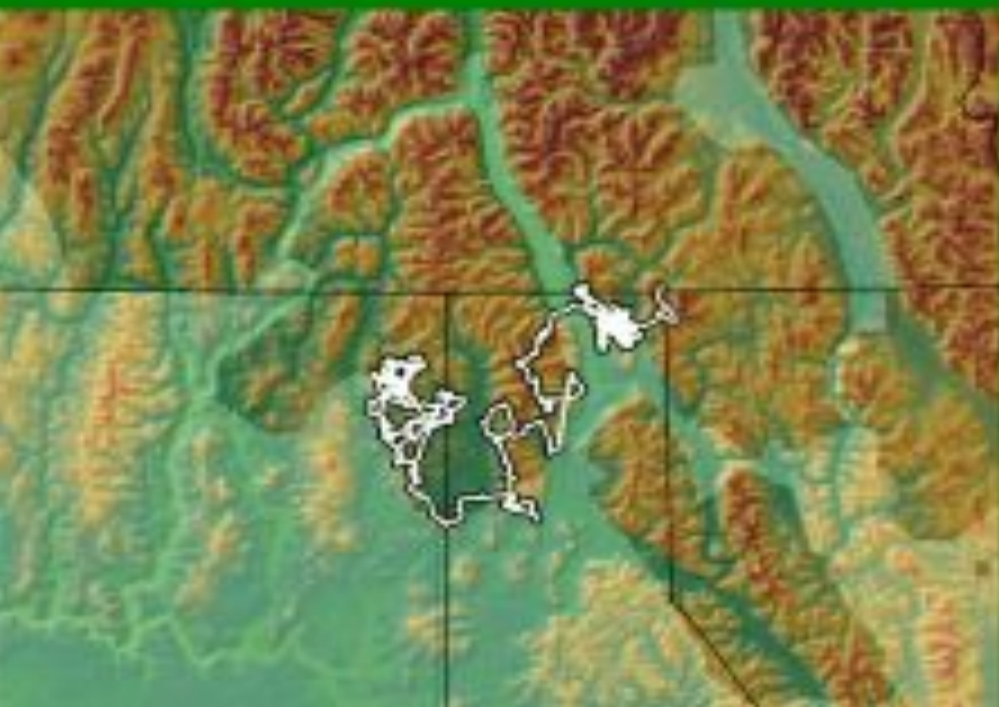
Habitat modeling



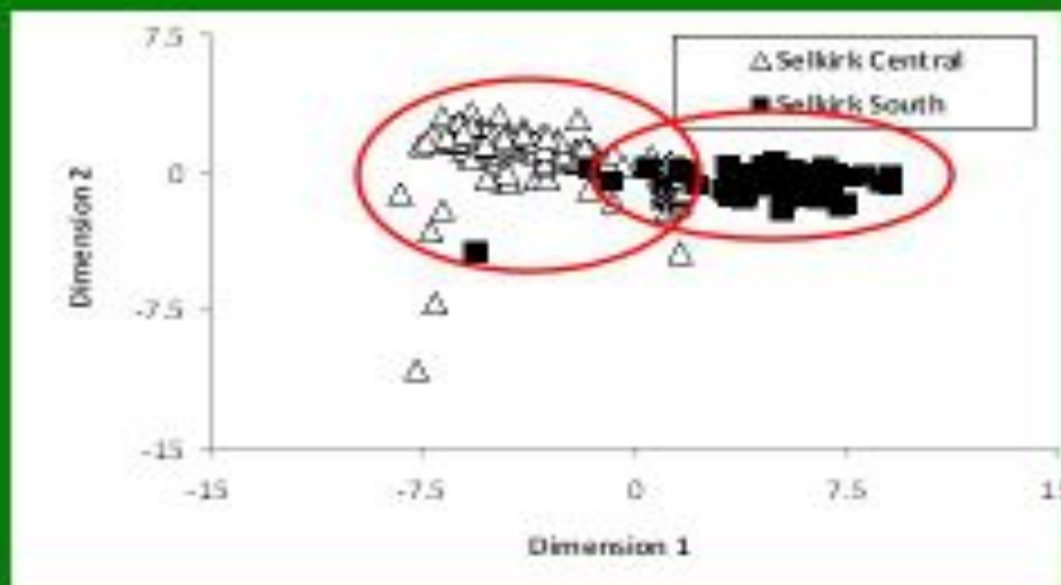
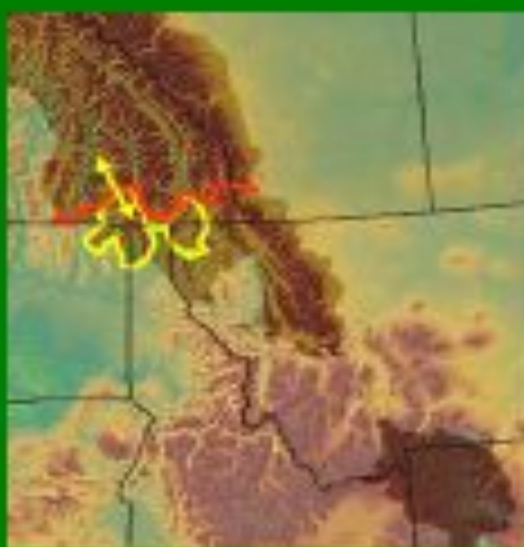
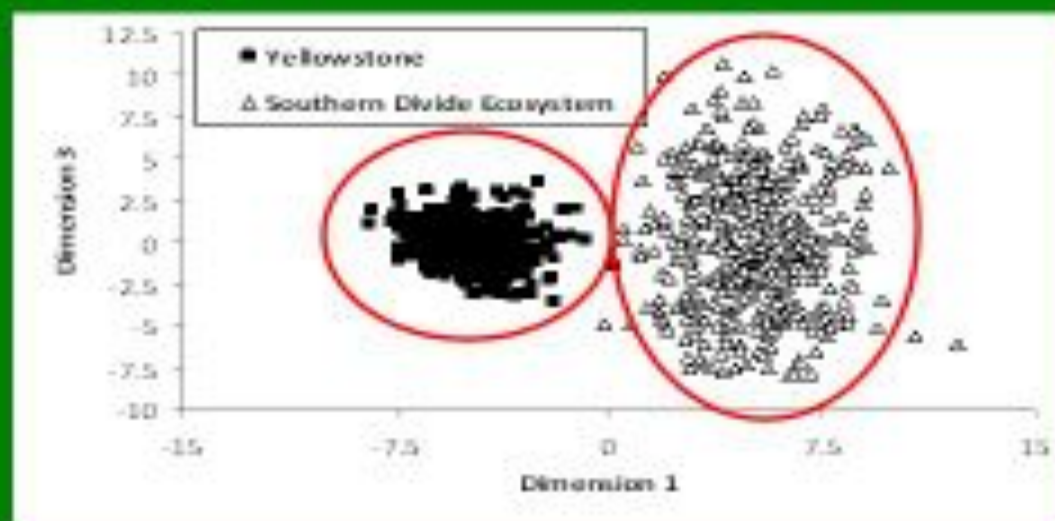
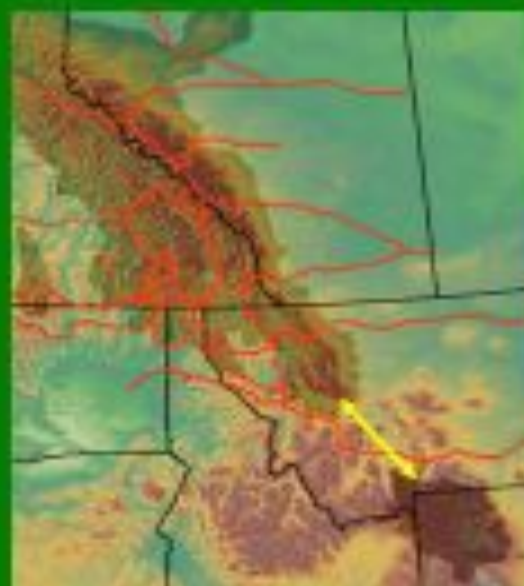
# Radio telemetry locations from 792 grizzly bears



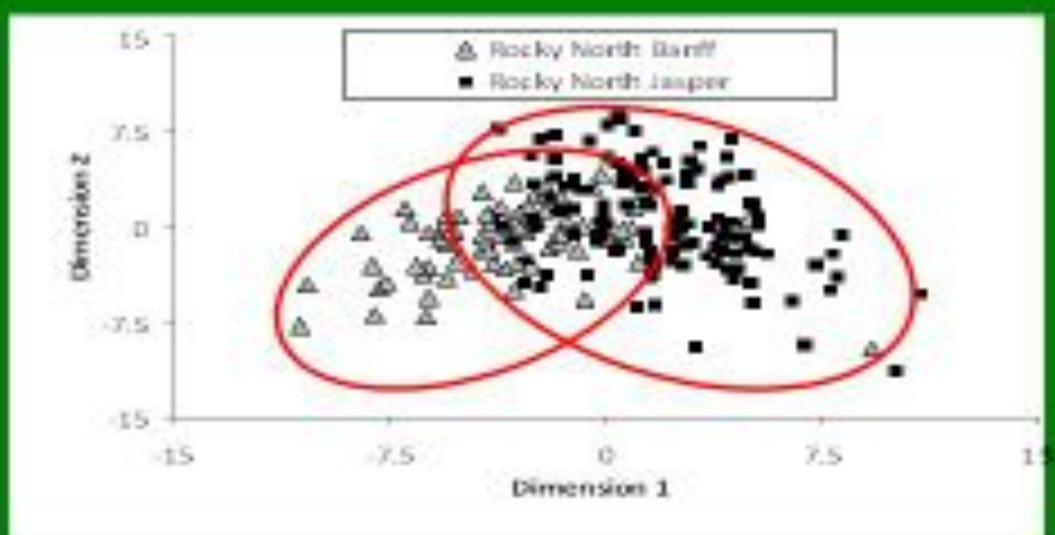
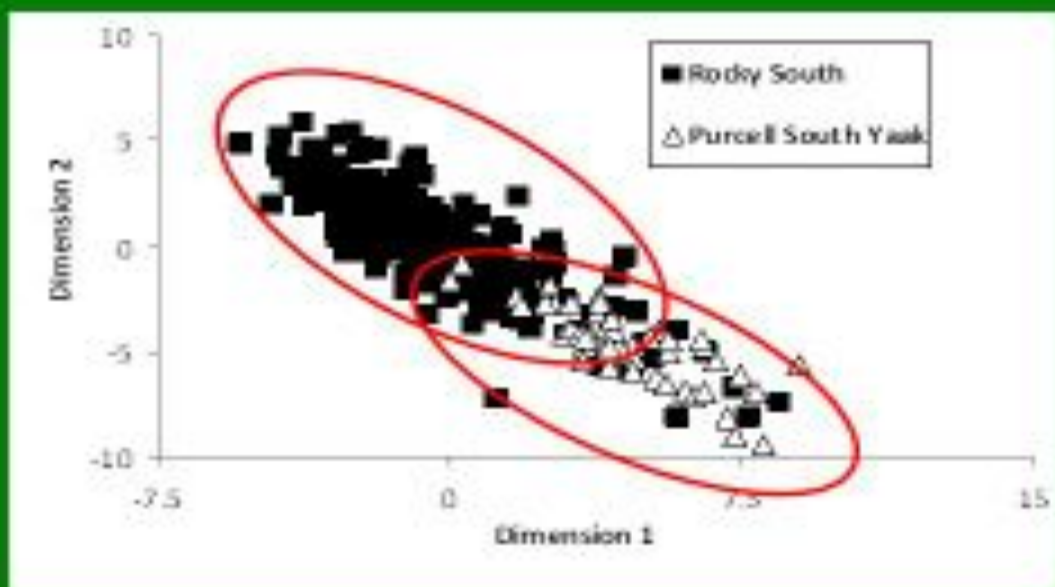
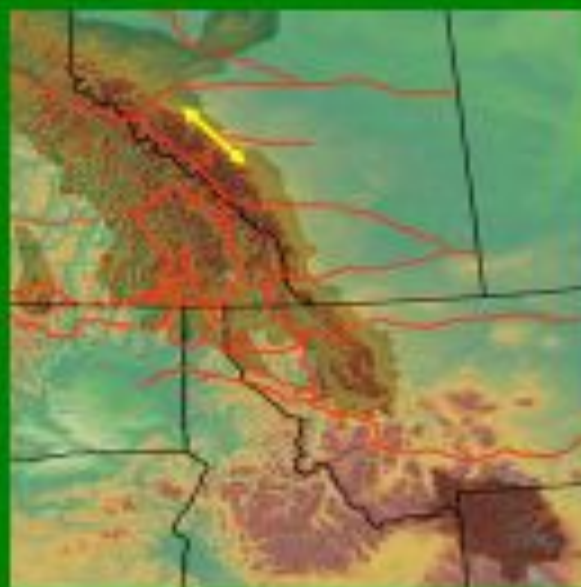




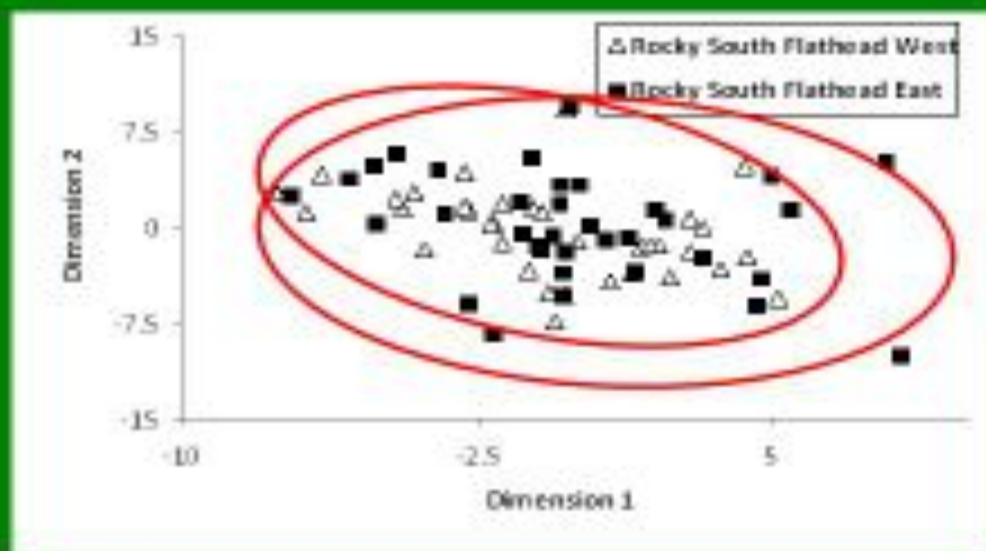
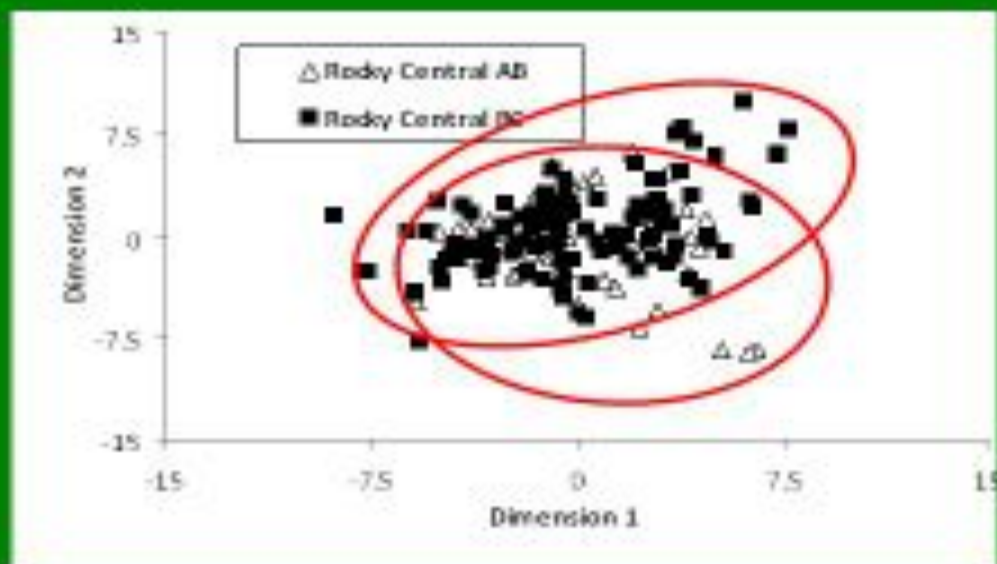
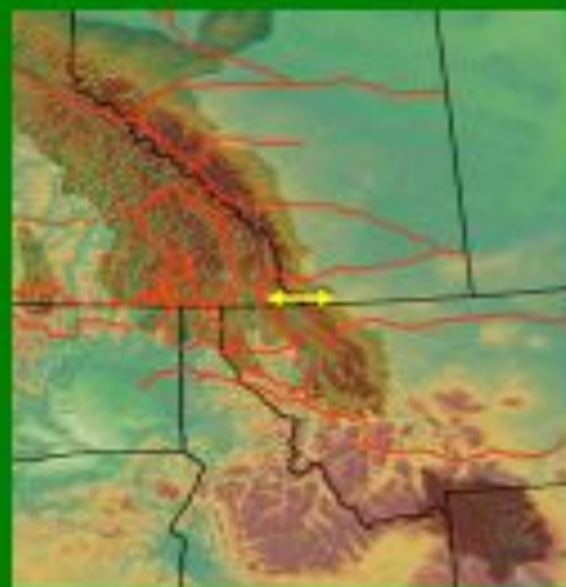
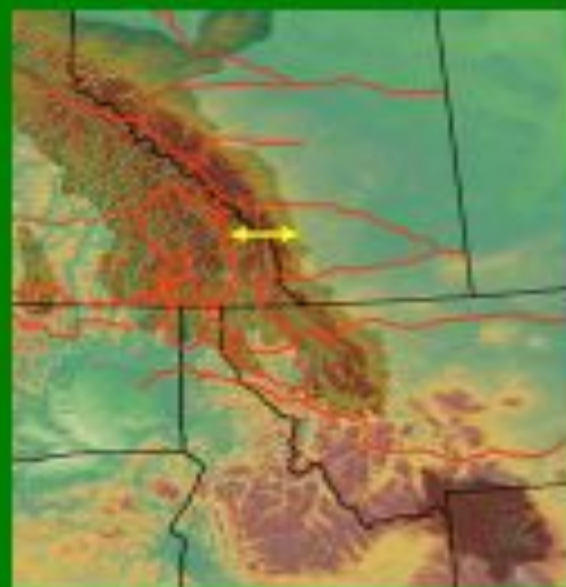
# Highly fragmented



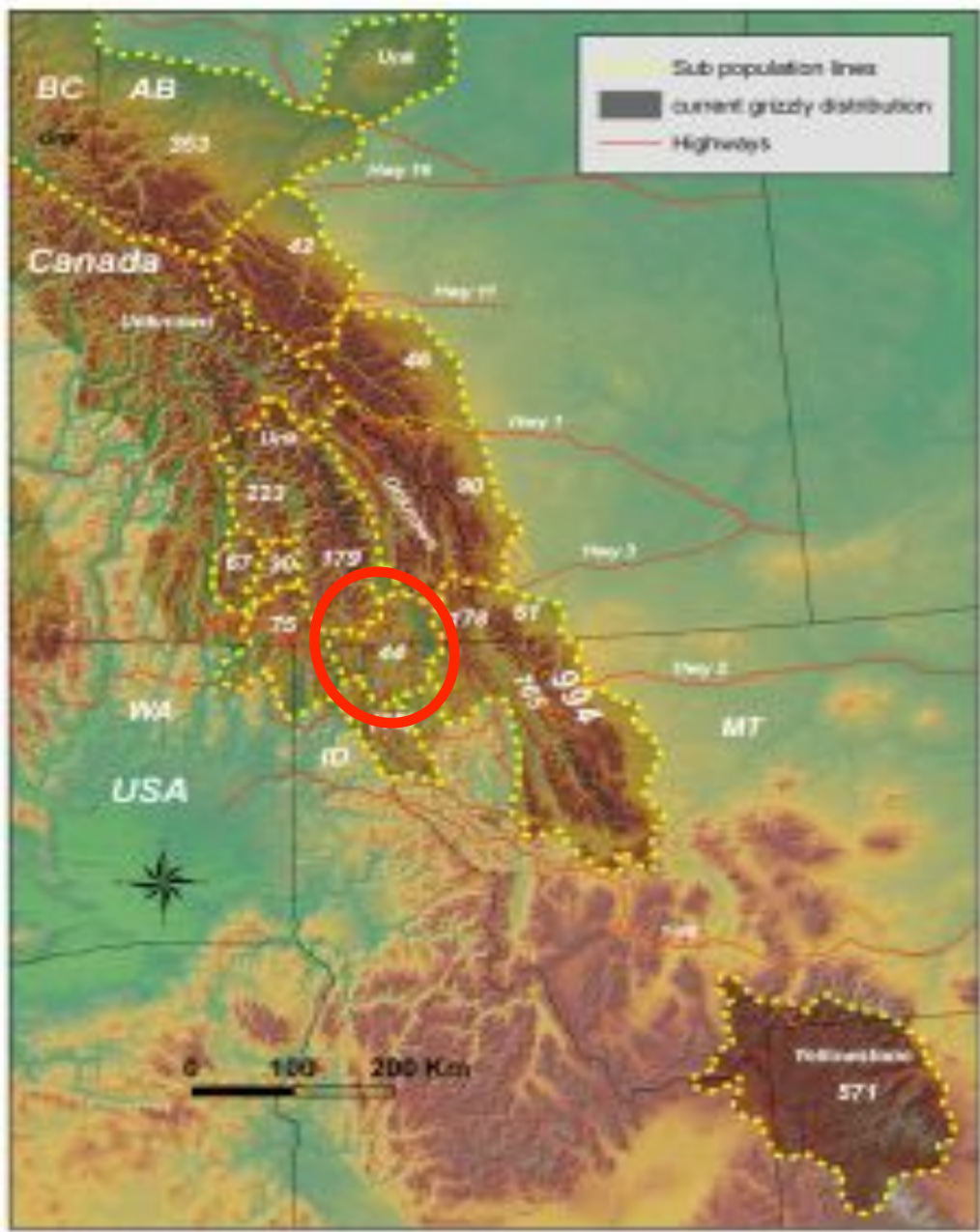
# Moderately fragmented

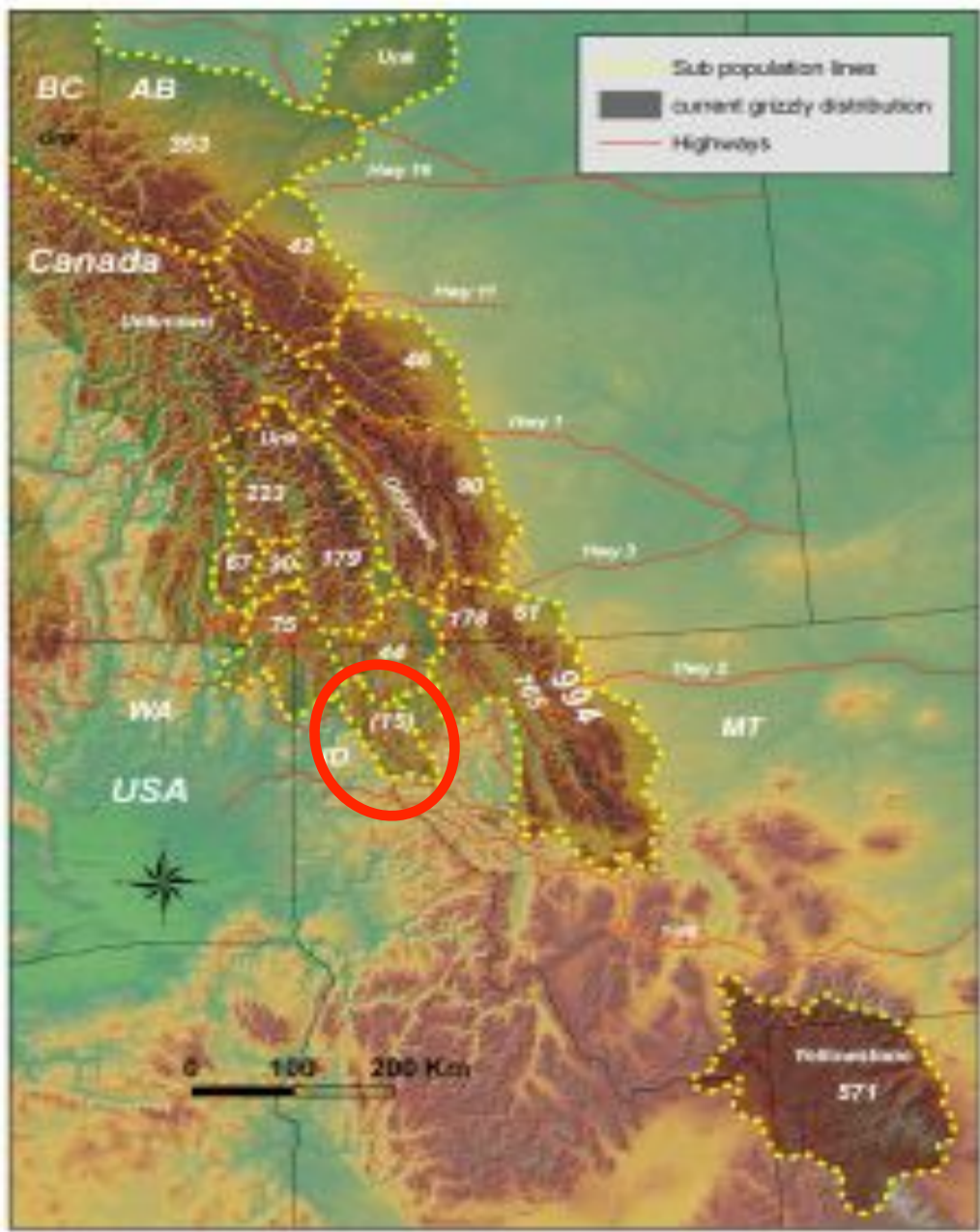


# Not fragmented





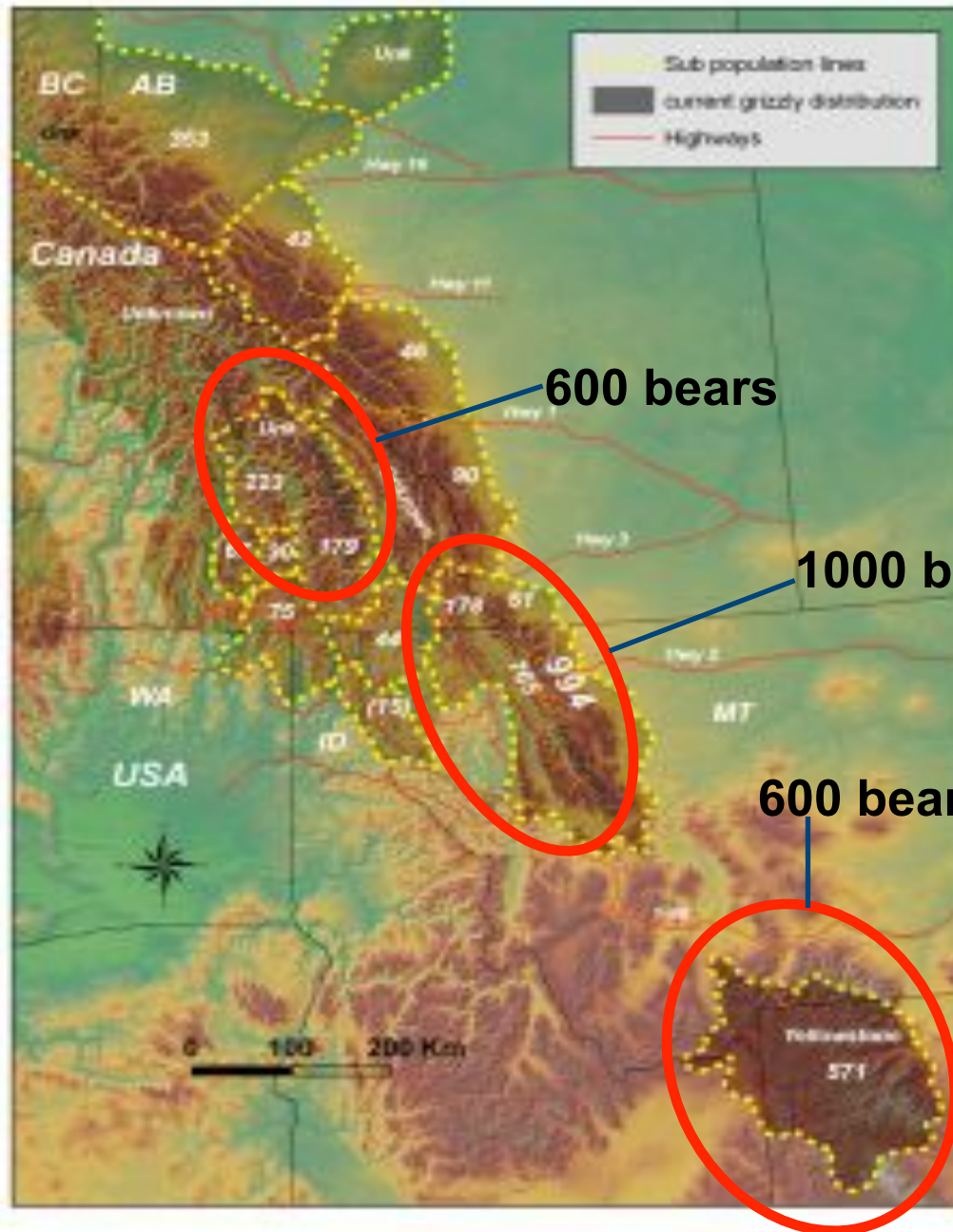


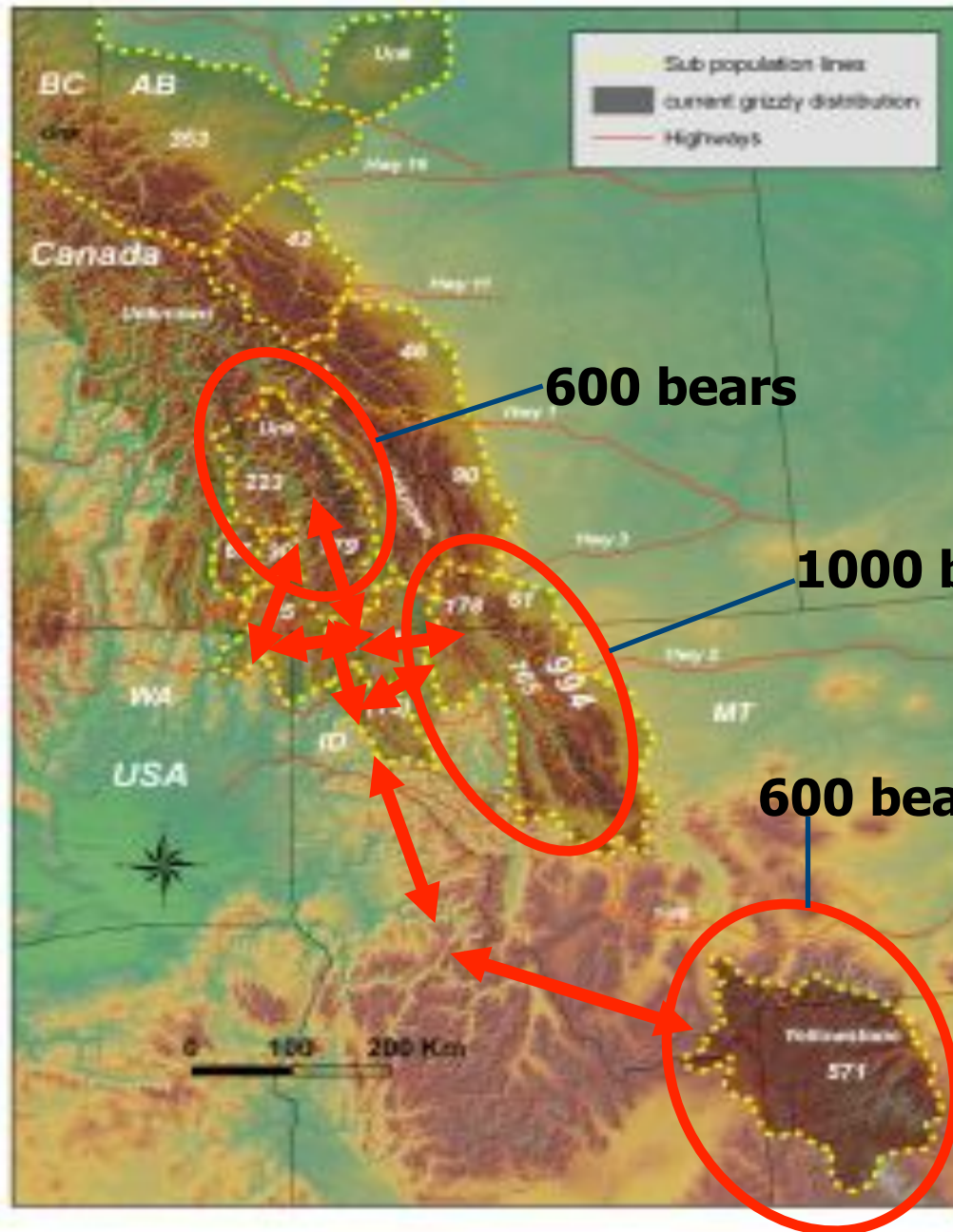












What is causing the fragmentation?













# Grizzly bear linkage area identification using GPS telemetry and habitat modeling in the fragmented trans-border region of southern British Columbia and northern Montana and Idaho

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JOHN HARRIS, Department of Wildlife Science, University of Alberta, Edmonton, T6G 2G1, Canada



**THE SOLUTION**

# GPS telemetry





























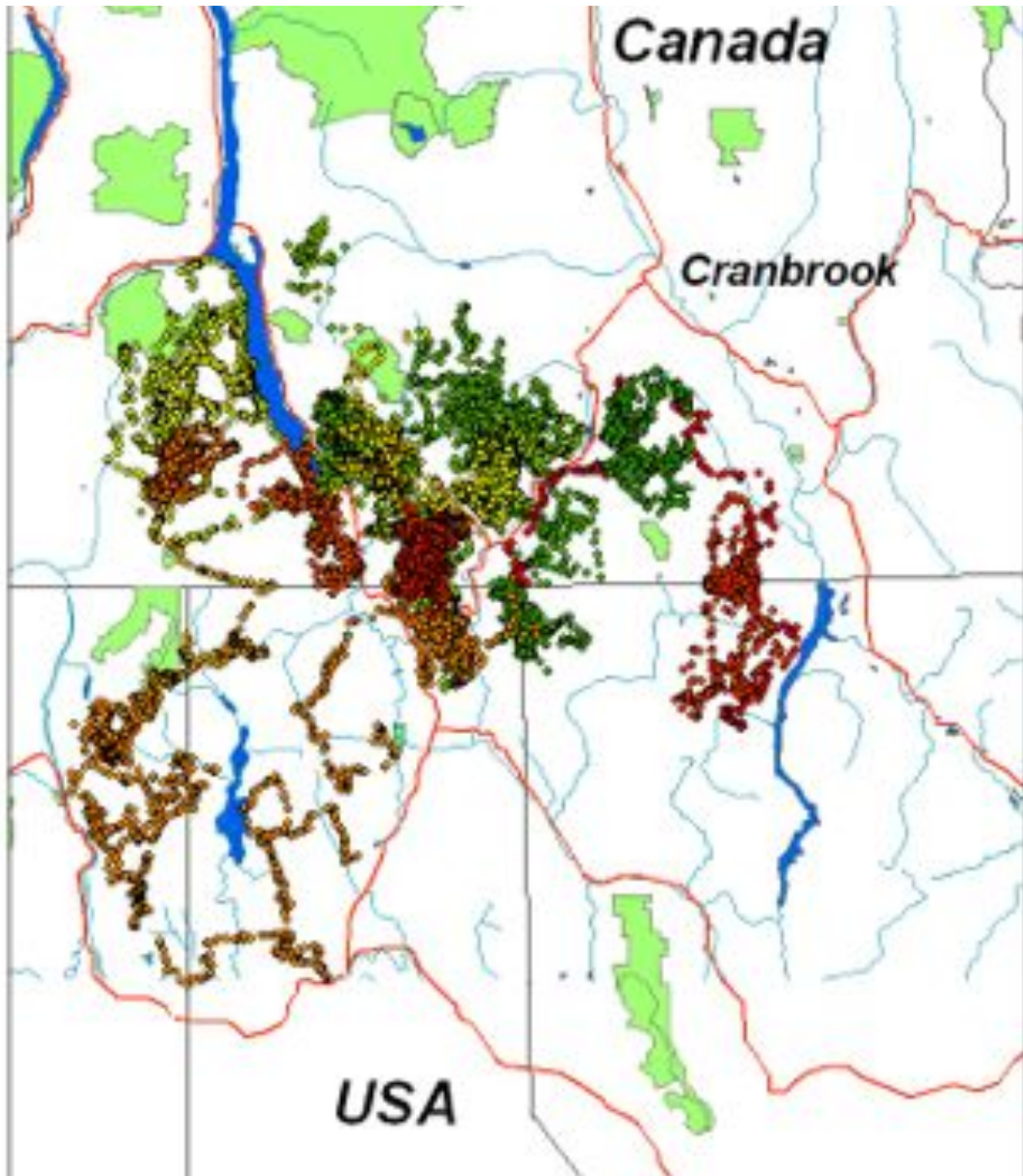




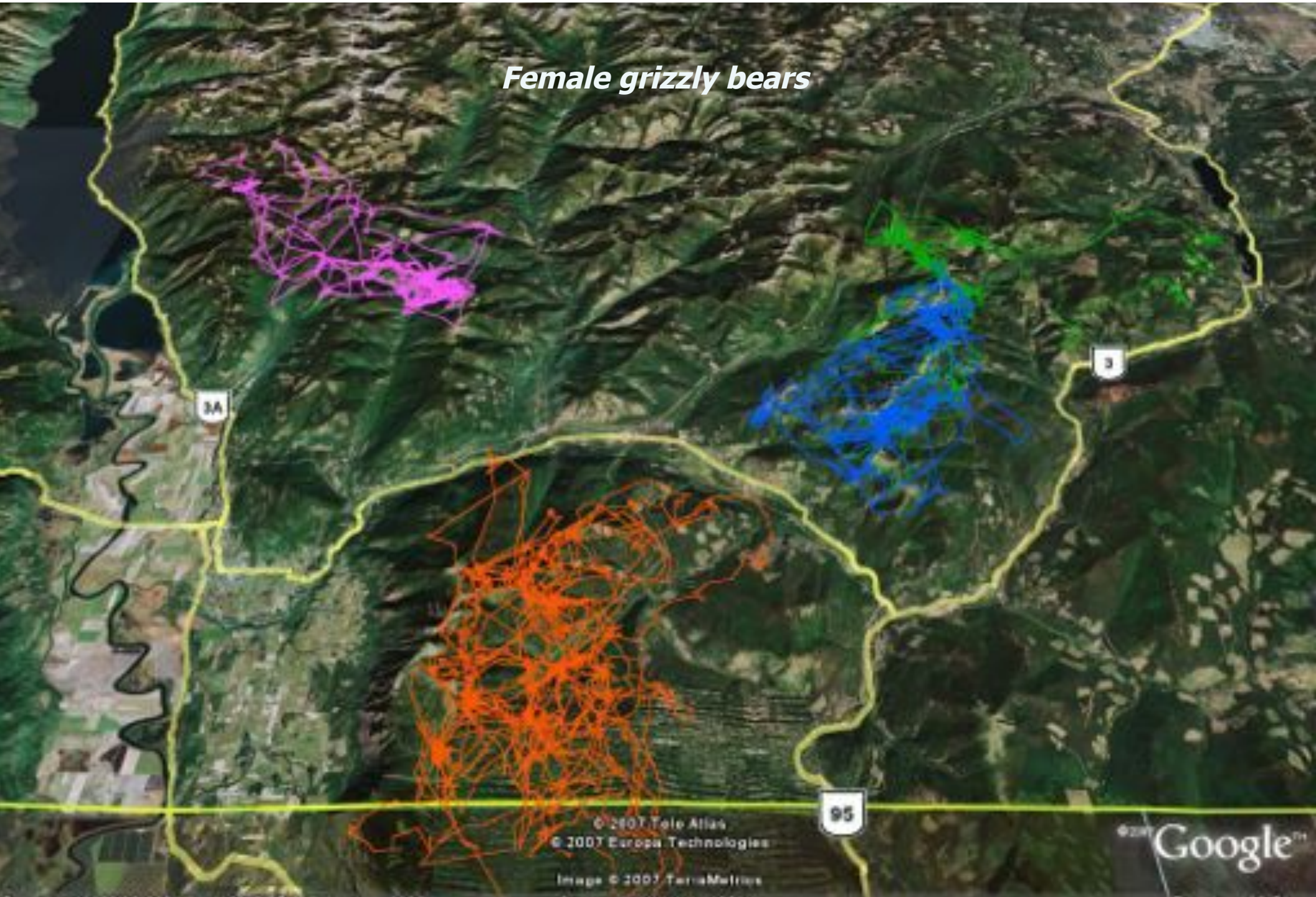




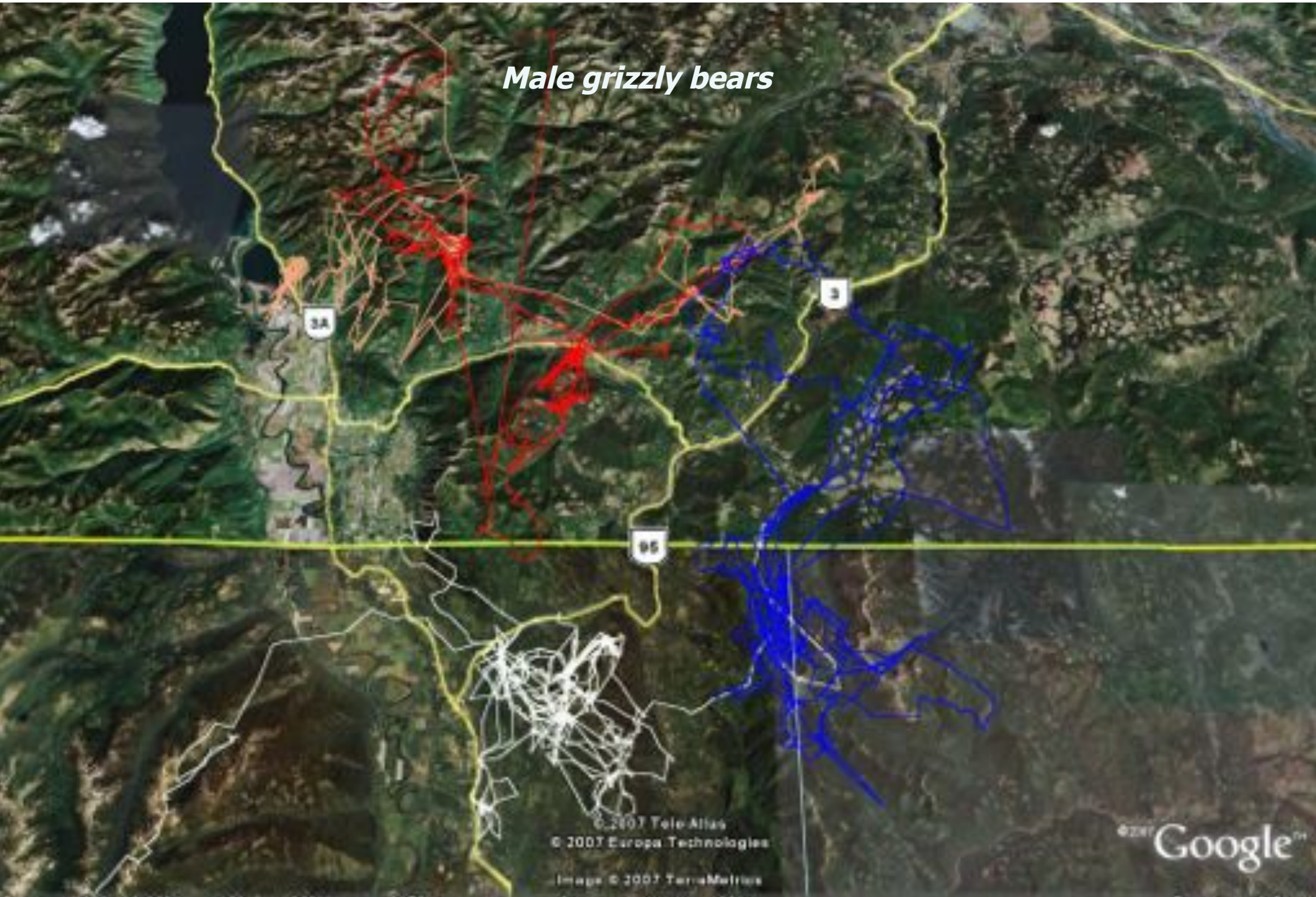




*Female grizzly bears*



*Male grizzly bears*

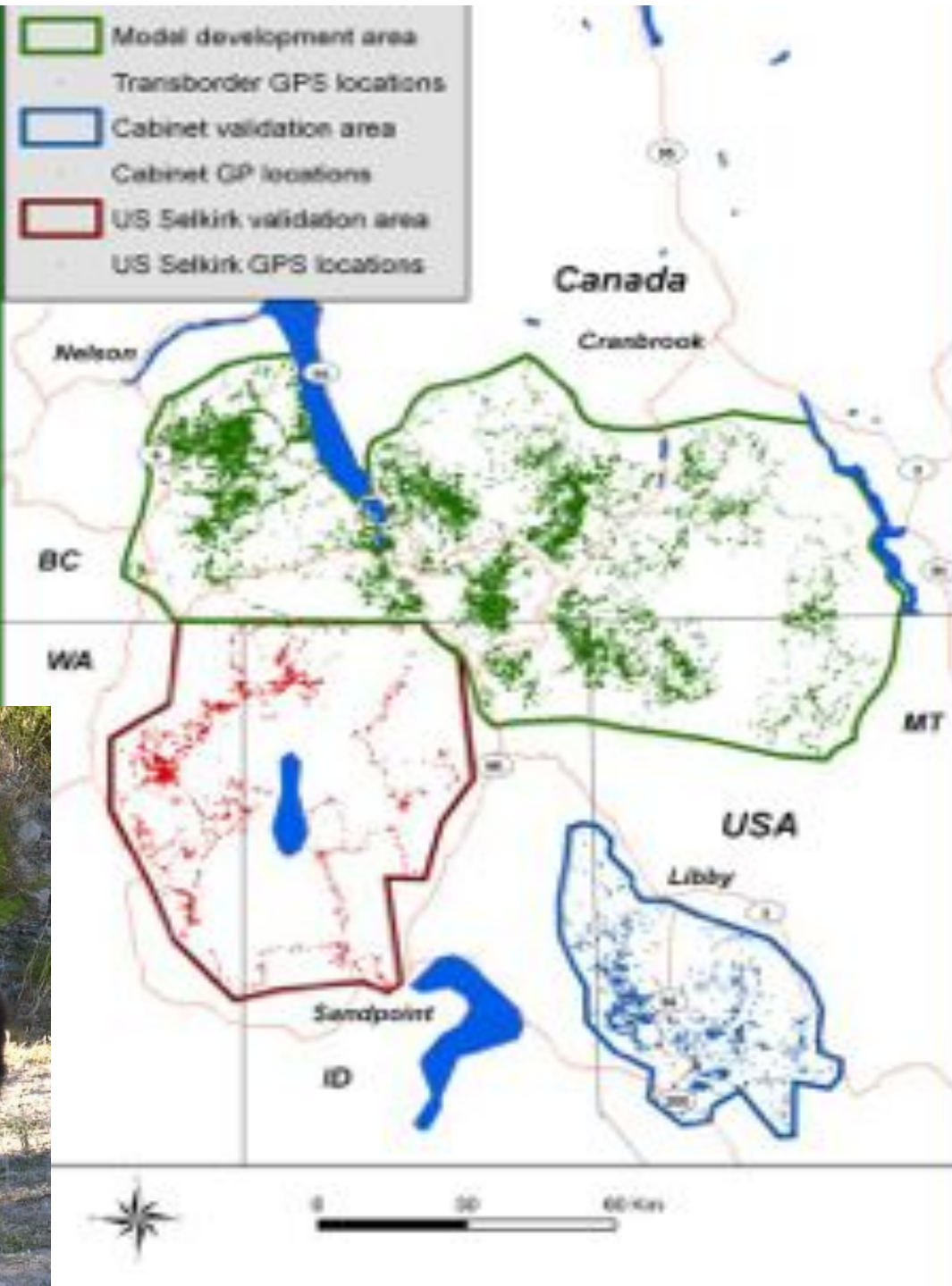


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Image © 2007 TerraMetrics

©2007 Google™



**~40,000  
GPS  
locations**



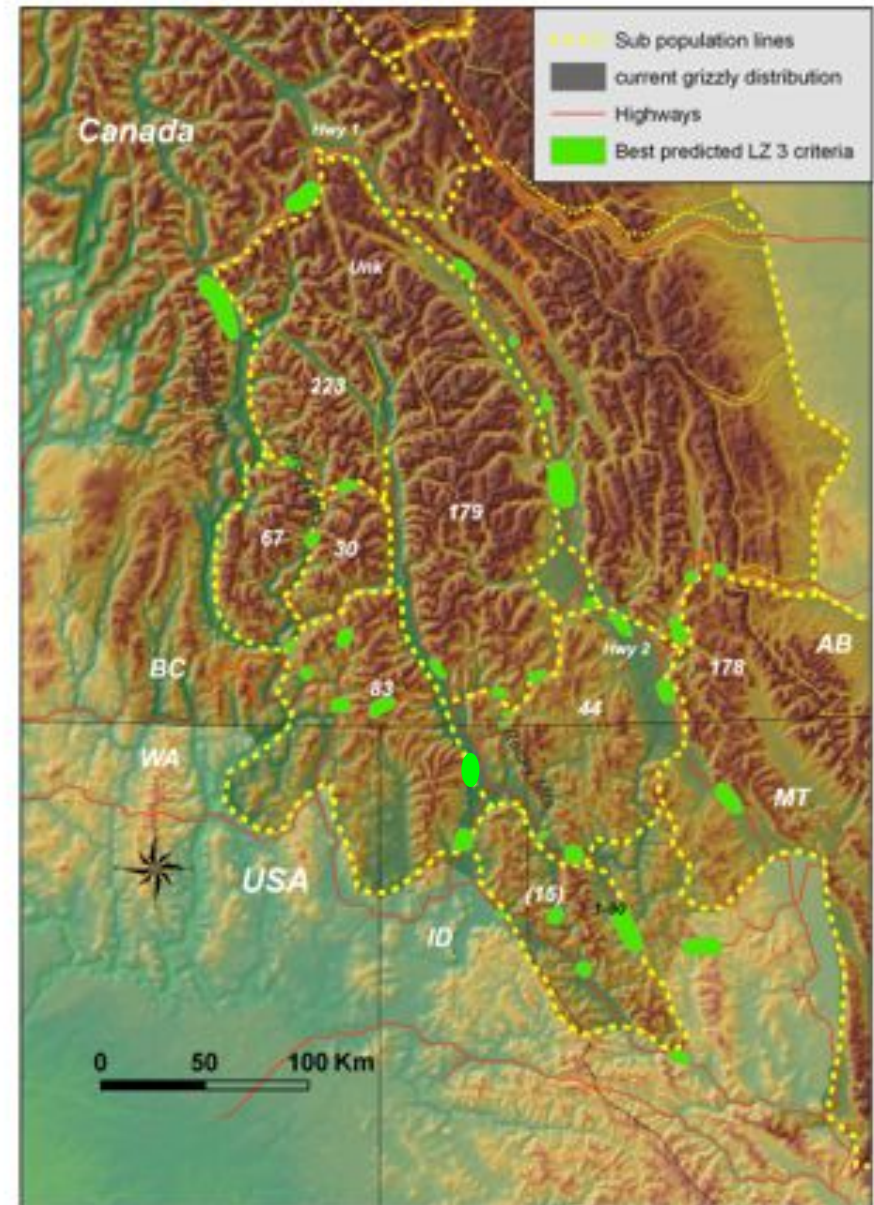






0 50 100 Km

**Identified  
39 linkage areas across  
14 major highway and  
settlement corridors**



**Grizzly bear linkage enhancement plan for  
Highways 3 & 3A corridors in the south Purcell and Selkirk  
Mountains of British Columbia**

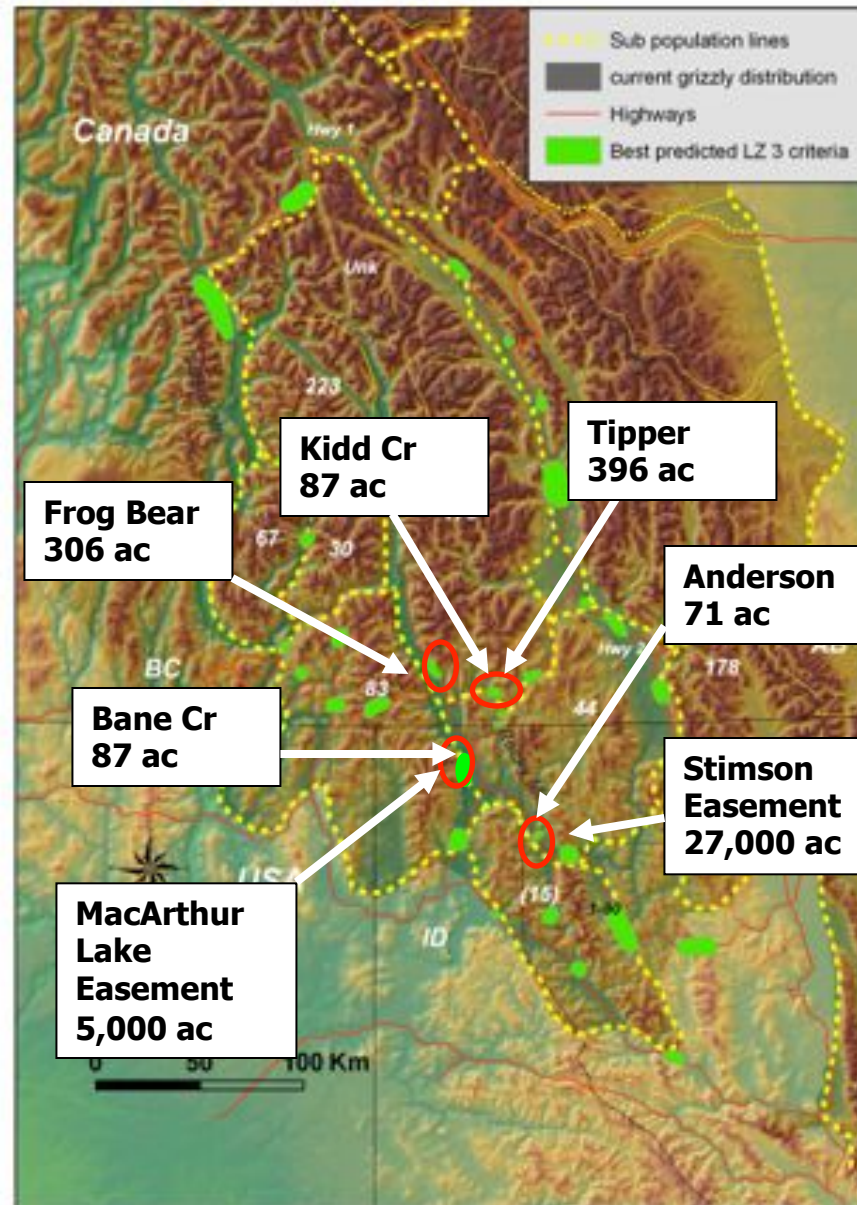


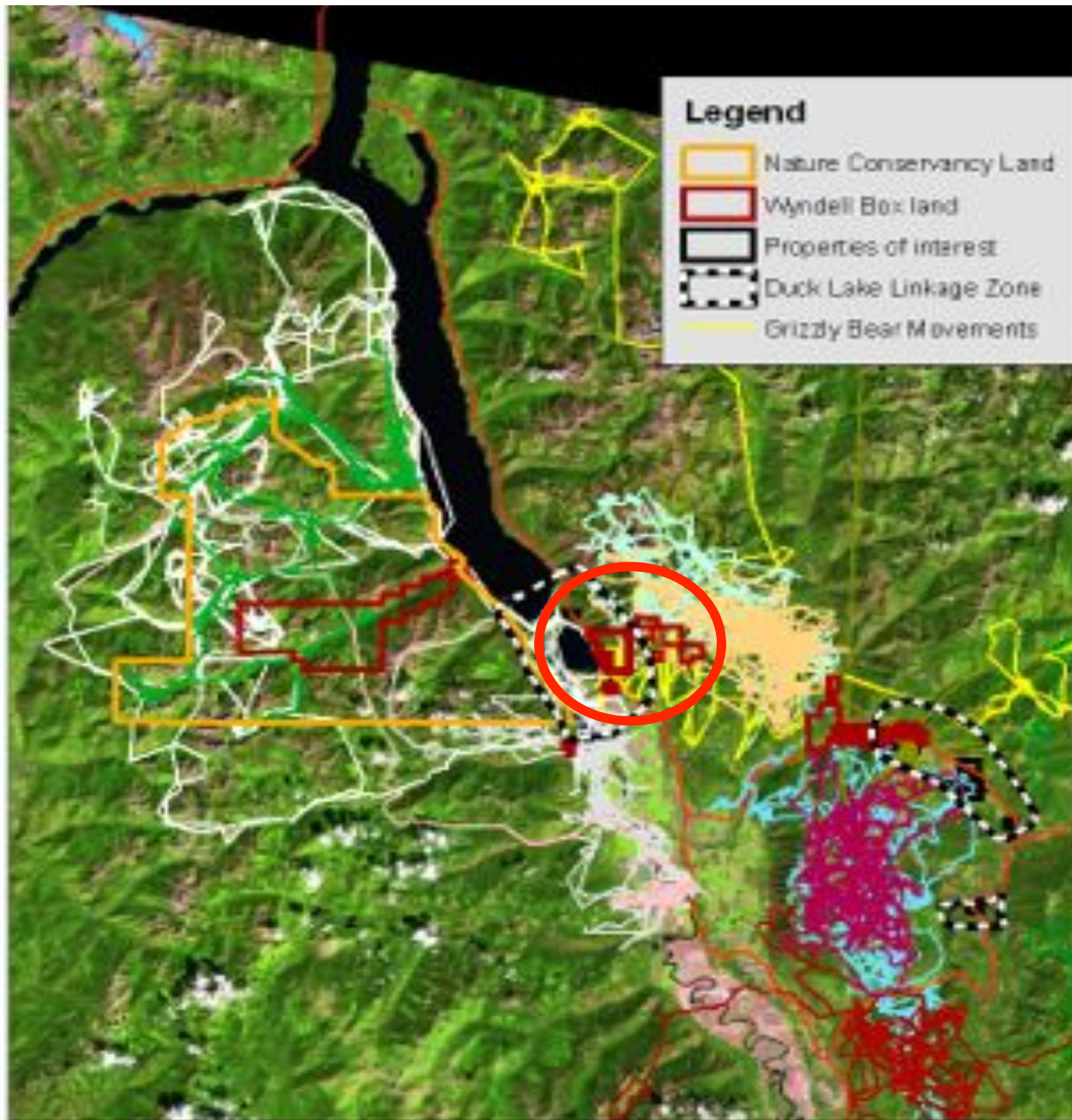
Researched and prepared by  
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Michael Proctor<sup>1</sup>  
Chris Servheen<sup>2</sup>  
Wayne Kasworm<sup>3</sup>  
Tom Radandt<sup>2</sup>

**IMPLEMENTATION**

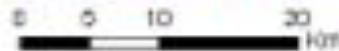
<sup>1</sup> Decidule Ecological  
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<sup>2</sup> US Fish and Wildlife Service - College of Forestry  
and Conservation, 309 University Hall, University of Montana, Missoula, MT 59812, USA  
<sup>3</sup> US Fish and Wildlife Service  
475 Fish Hatchery Road, Libby, MT 59923, USA

**March 2008**





*Michael Proctor*  
*Trans Border Grizzly Bear Project*



# Frog Bear Property



# Frog Bear Property

Trans-border Grizzly Bear Project  
Nature Conservancy Canada  
Y2Y, Harvey Locke



# Bear Aware





**Pedigree analysis to assess and monitor functional connectivity of grizzly bears in the trans-border region of northern Montana, Idaho, Washington, and southern British Columbia**

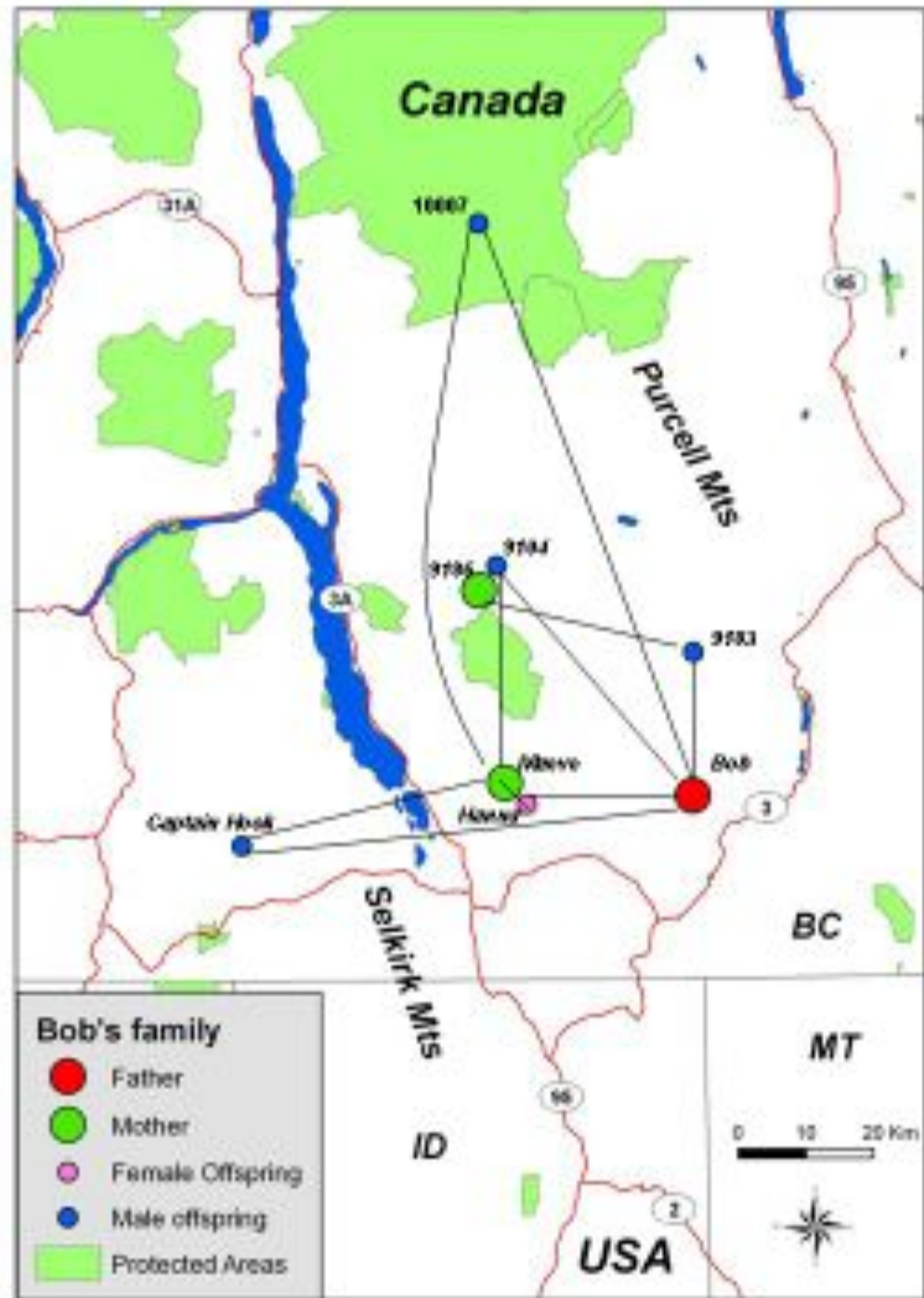


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Wayne Kasworm, USFWS  
Wayne Wakkinen, Idaho Fish & Game  
Chris Servheen, USFWS**

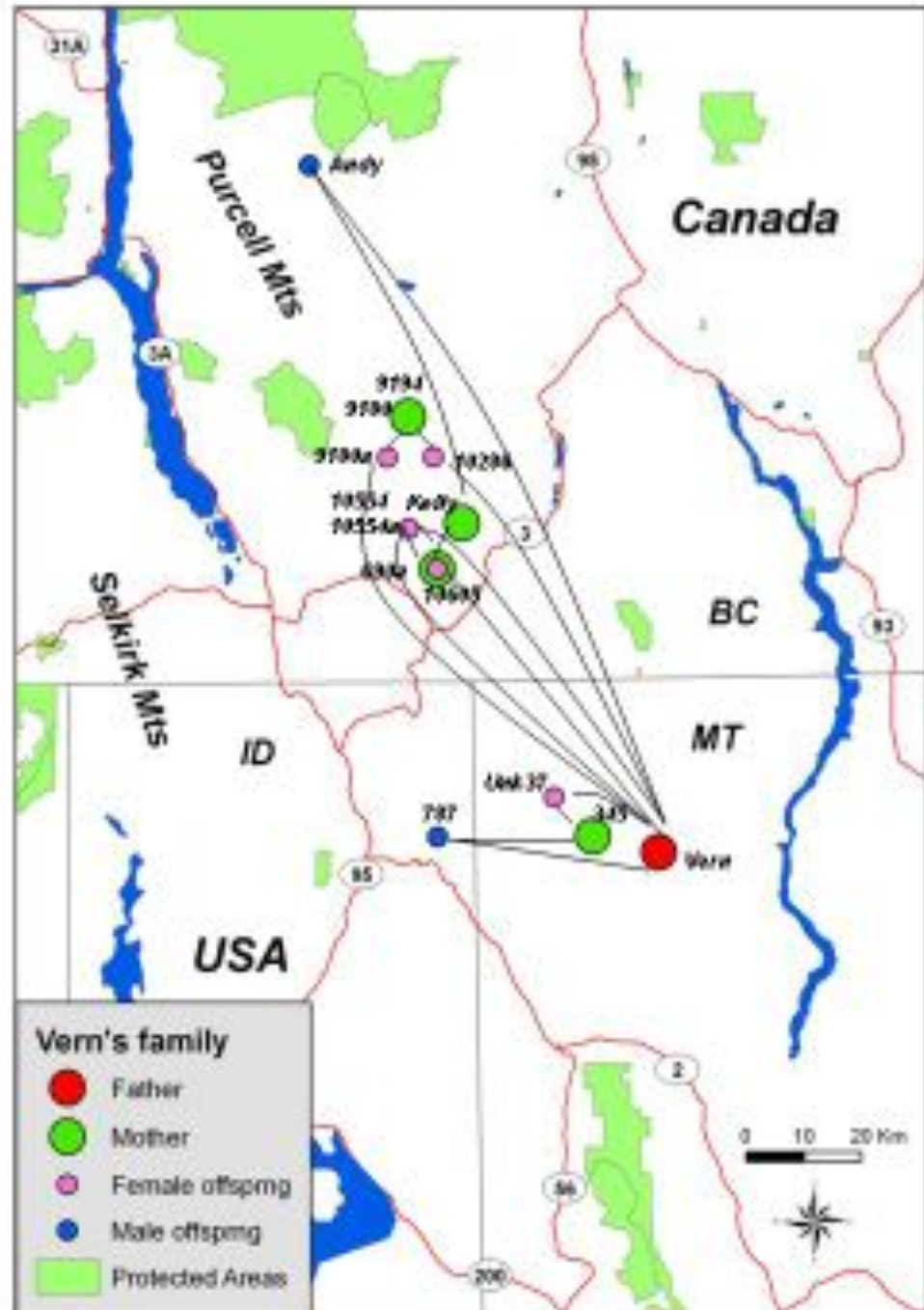
**Prepared for  
Great Northern Landscape Conservation Cooperative  
Liz Claiborne Art Ortenberg Foundation  
Wilburforce Foundation  
Habitat Conservation Trust Foundation  
Columbia Basin Fish Wildlife Compensation Program  
National Fish and Wildlife Foundation  
Yellowstone to Yukon Conservation Initiative**

**December 2012**

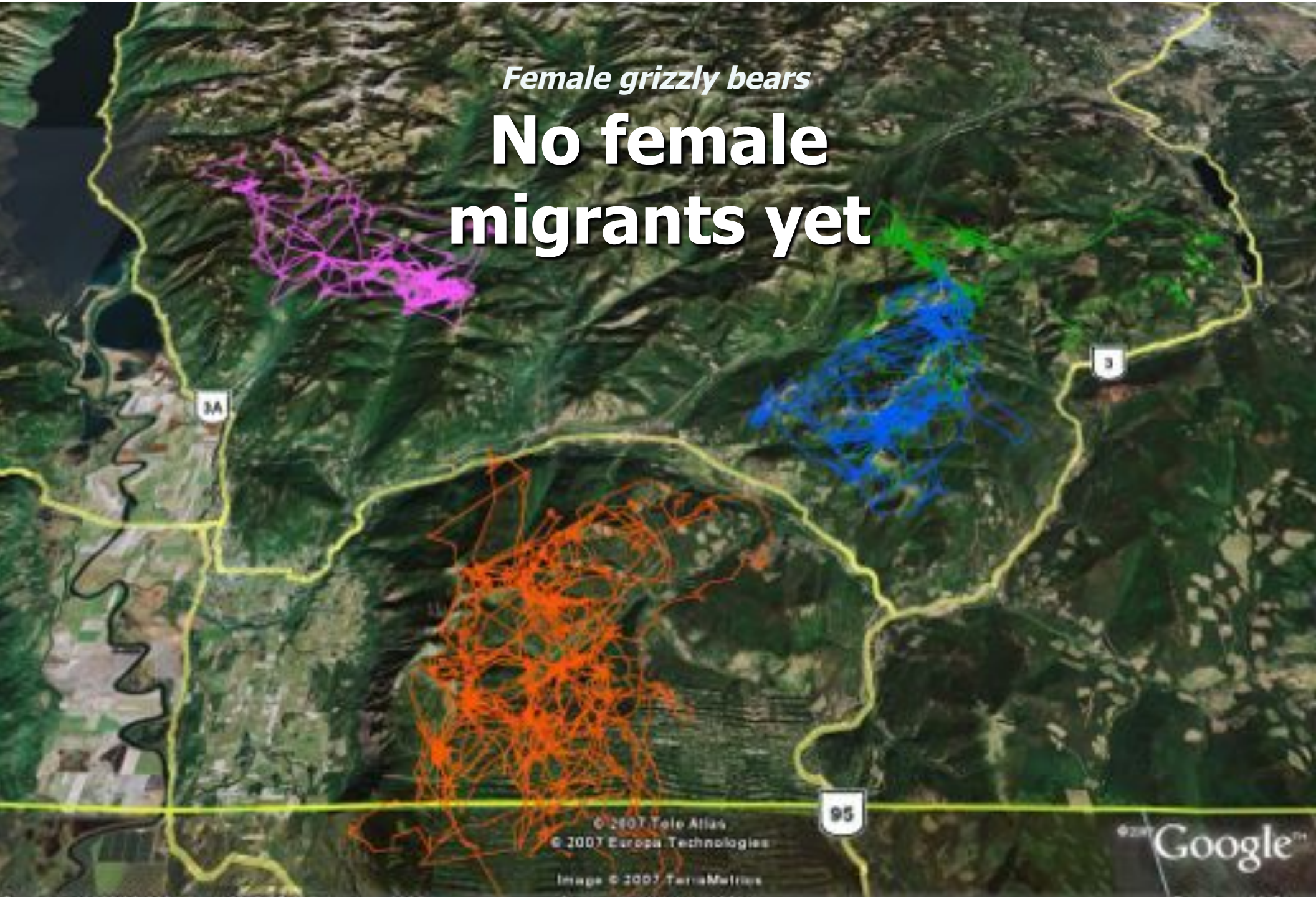
# Male dispersal



# Male breeding across BC Hwy 3



*Female grizzly bears*  
**No female  
migrants yet**





Government of Alberta



BRITISH COLUMBIA



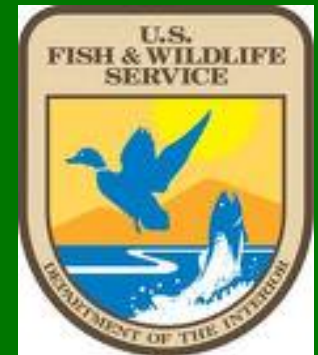
ern  
ERATIVE

# Funders

**Habitat Conservation Trust Foundation**  
**Fish & Wildlife Compensation Program**  
**National Fish & Wildlife Foundation**  
**Liz Claiborne & Art Ortenberg Foundation**  
**US Fish & Wildlife Service**  
**Wilburforce Foundation**  
**Great Northern Landscape Conservation Cooperative**  
**Yellowstone to Yukon Conservation Initiative**  
**Nature Conservancy of Canada**  
**Columbia Basin Trust**  
**Parks Canada**  
**Alberta Ingenuity**  
**NSERC**  
**Killam Trust**  
**Tembec Industries**  
**BC Min of Environment**  
**BC Min of Forests**  
**BC Parks**  
**Creston Valley Wildlife Management Area**



Fish & Wildlife Compensation Program

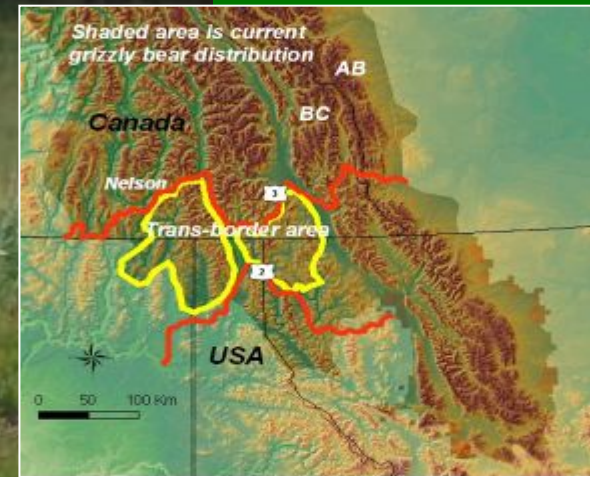


Natural Sciences and Engineering Research Council of Canada

Conseil de recherches en sciences naturelles et en génie du Canada



# Trans-border Grizzly Bear Project



- HOME
- ABOUT US
- TRANS-BORDER GB STATUS
- RESEARCH RESULTS
- PARTNERS
- CONTACT US

## QUICK LINKS

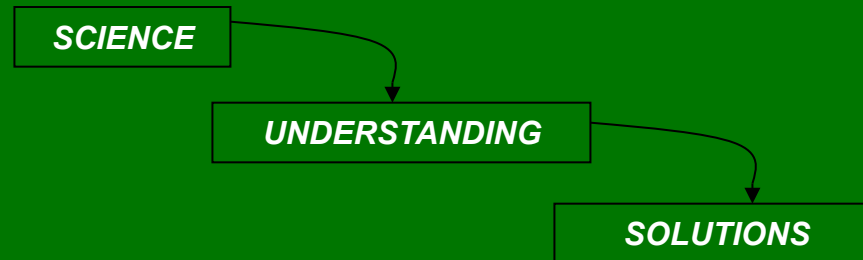
- Linkage Zones
- Bear Aware
- Report a problem grizzly
- Bear-proof your home site
- Electric fencing
- Education slide shows
- Know your bear species

Help us teach grizzly bears to avoid trouble. [Learn how](#)



Our goal is to use science to understand conservation challenges for grizzly bears in the Trans-border southern Selkirk and Purcell Mountains of British Columbia, NW Montana, and N Idaho and implement our researched solutions

Use this website to see how grizzly bears in this area are doing, what we are doing, and what you can do.



## CONSERVATION SOLUTIONS

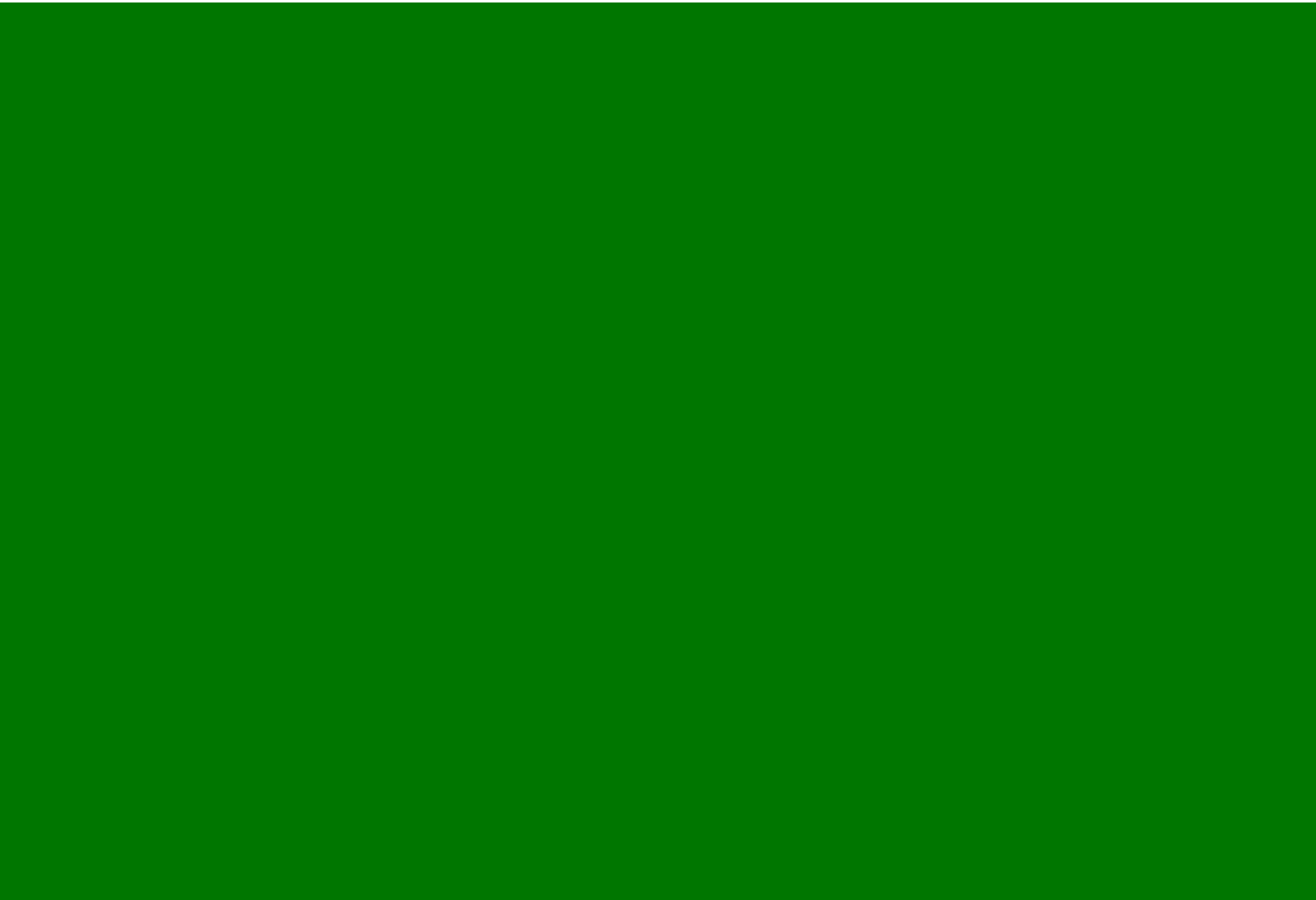
**FRAGMENTATION**

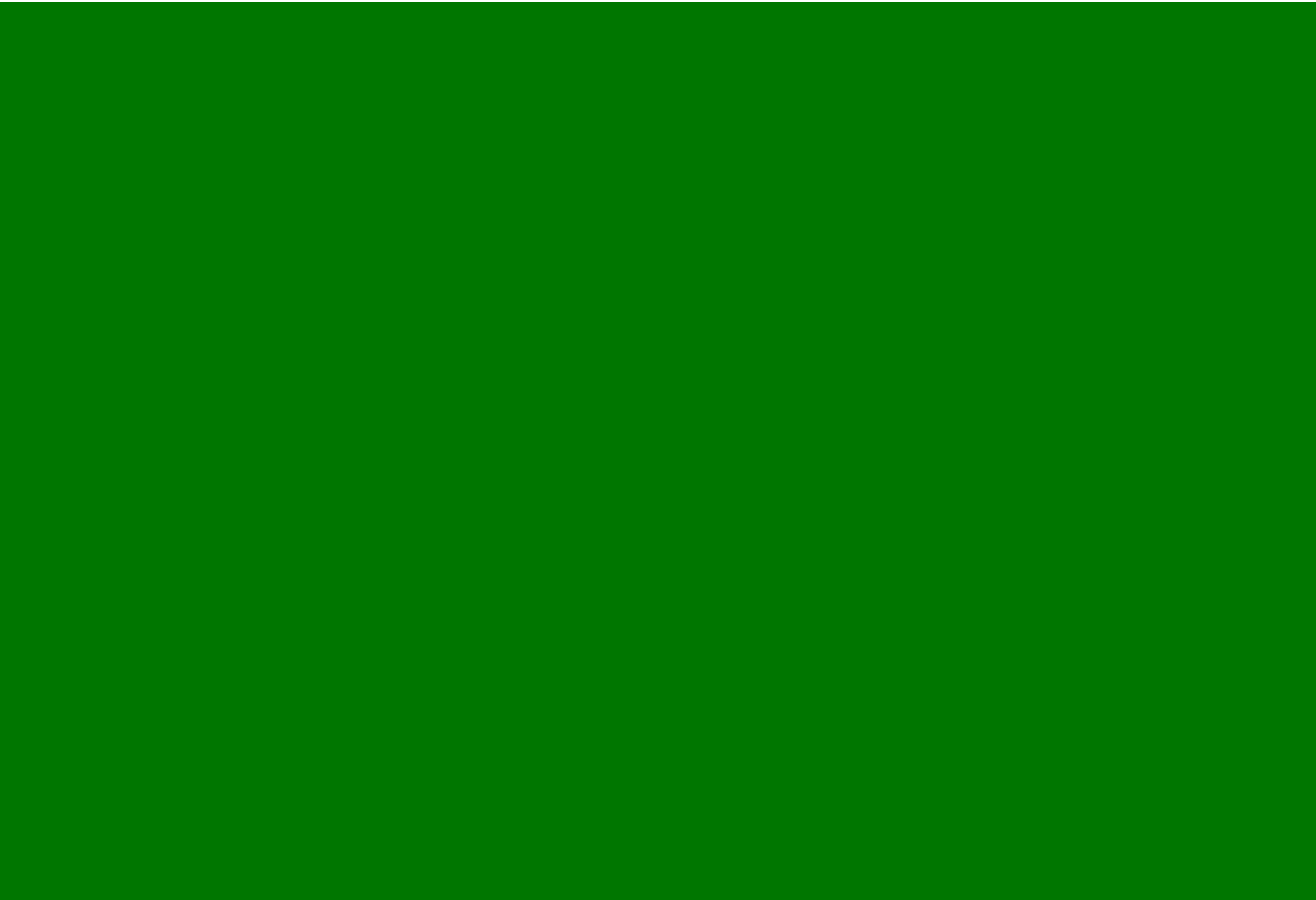
**MORTALITY**

**HABITAT SECURITY**

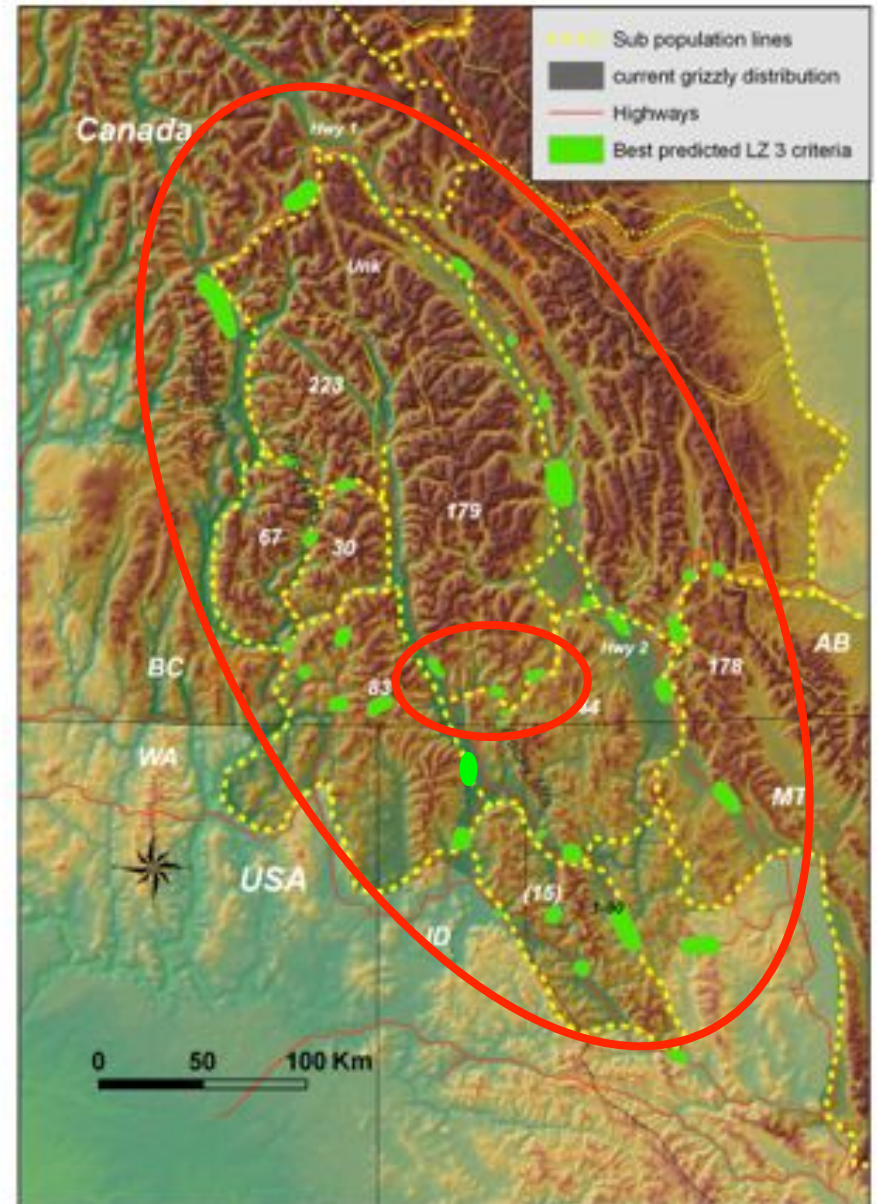


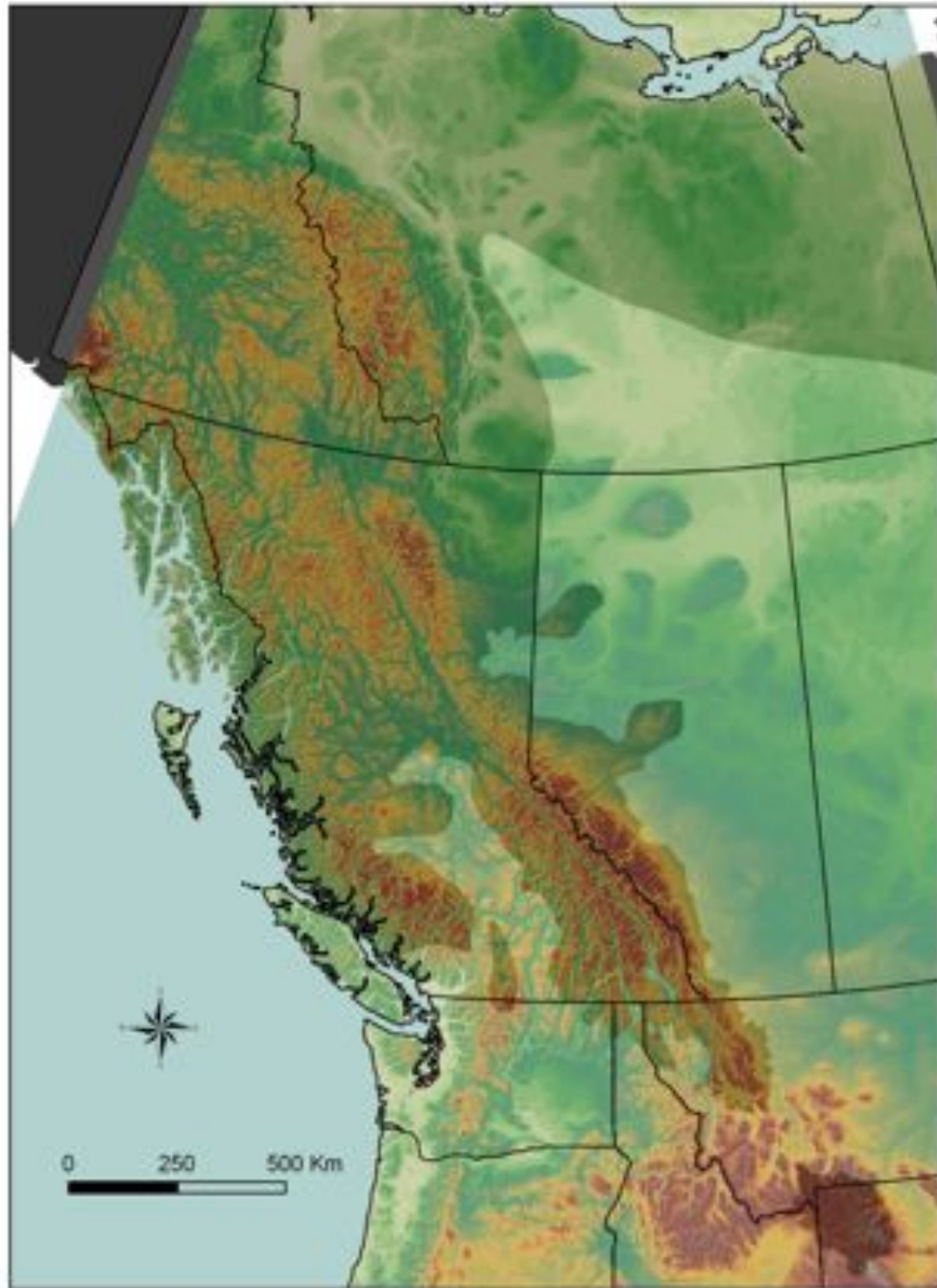


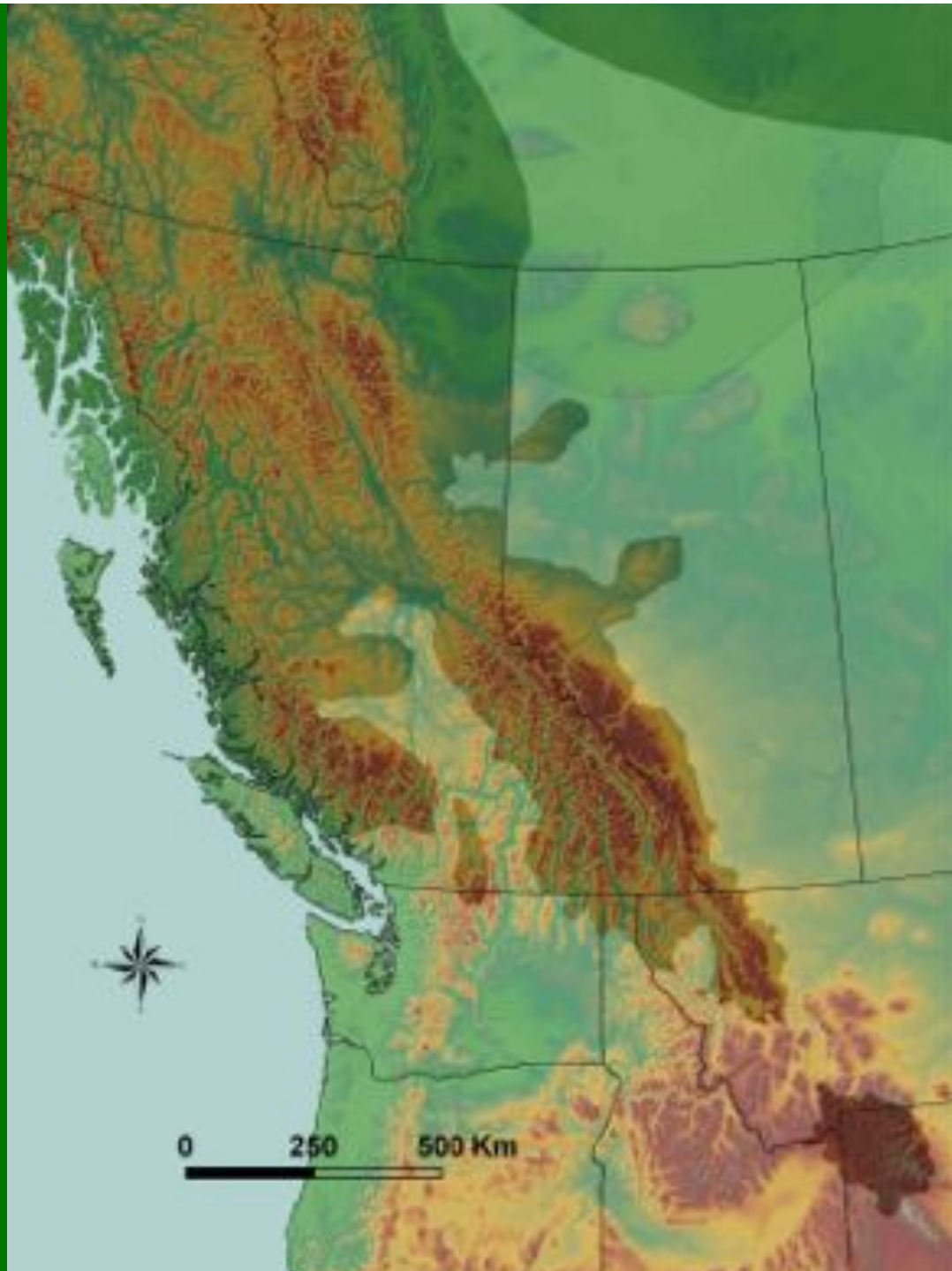




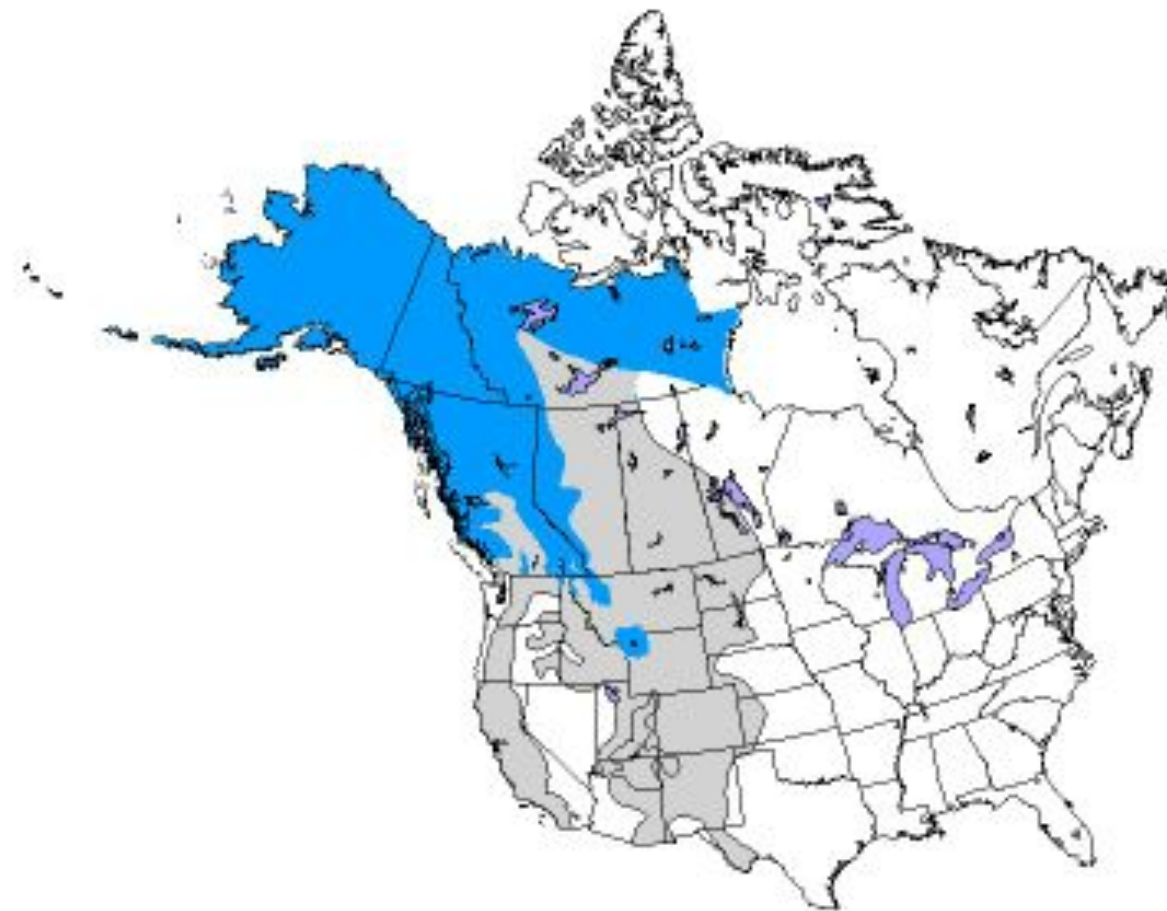
**We are starting a  
Linkage area  
assessment and  
prioritization  
analysis**









# Current and historical North American grizzly bear distribution



-  Current North American grizzly bear distribution
-  Historical North American grizzly bear distribution



1000 0 1000 Kilometers









[Transbordergrizzlybearproject.ca](http://Transbordergrizzlybearproject.ca)



