

From: [Grizzle, Betty](#)
To: [Caitlin Snyder](#); [Gregg Kurz](#); [Madeline Drake](#)
Subject: WAFWA PowerPoint re Wolverine Occupancy Study
Date: Tuesday, August 1, 2017 2:43:03 PM
Attachments: [Wolverine WAFWA July 2017 Final Distribute.pdf](#)

See attached - photos start on page 22!

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Betty J. Grizzle, D.Env.
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
2177 Salk Ave, Suite 250
Carlsbad, CA 92008
760-431-9440, ext. 215
760-431-5901 fax

Wolverine Conservation in the Western United States



Photo: Mark Packila



Winter 2016-17 Survey
for Baseline Occupancy and Genetics

Acknowledgements

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Wyoming Game & Fish



U. S. Fish & Wildlife Service

- CSWG
- GNLCC



National Fish & Wildlife Foundation



Montana Fish Wildlife & Parks



Idaho Fish & Game



Washington Fish & Wildlife



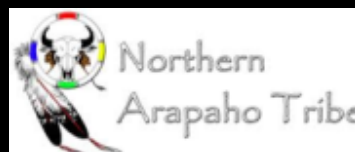
U. S. Forest Service



National Park Service



Wildlife Conservation Society



The Western States Wolverine Working Group:

Jeff Copeland – The Wolverine Foundation

Stacy Courville – Confederated Salish & Kootenai Tribes

Diane Evans Mack – Idaho Department of Fish & Game

Justin Gude – Montana Fish, Wildlife & Parks

Kim Heinemeyer – Round River Conservation Studies

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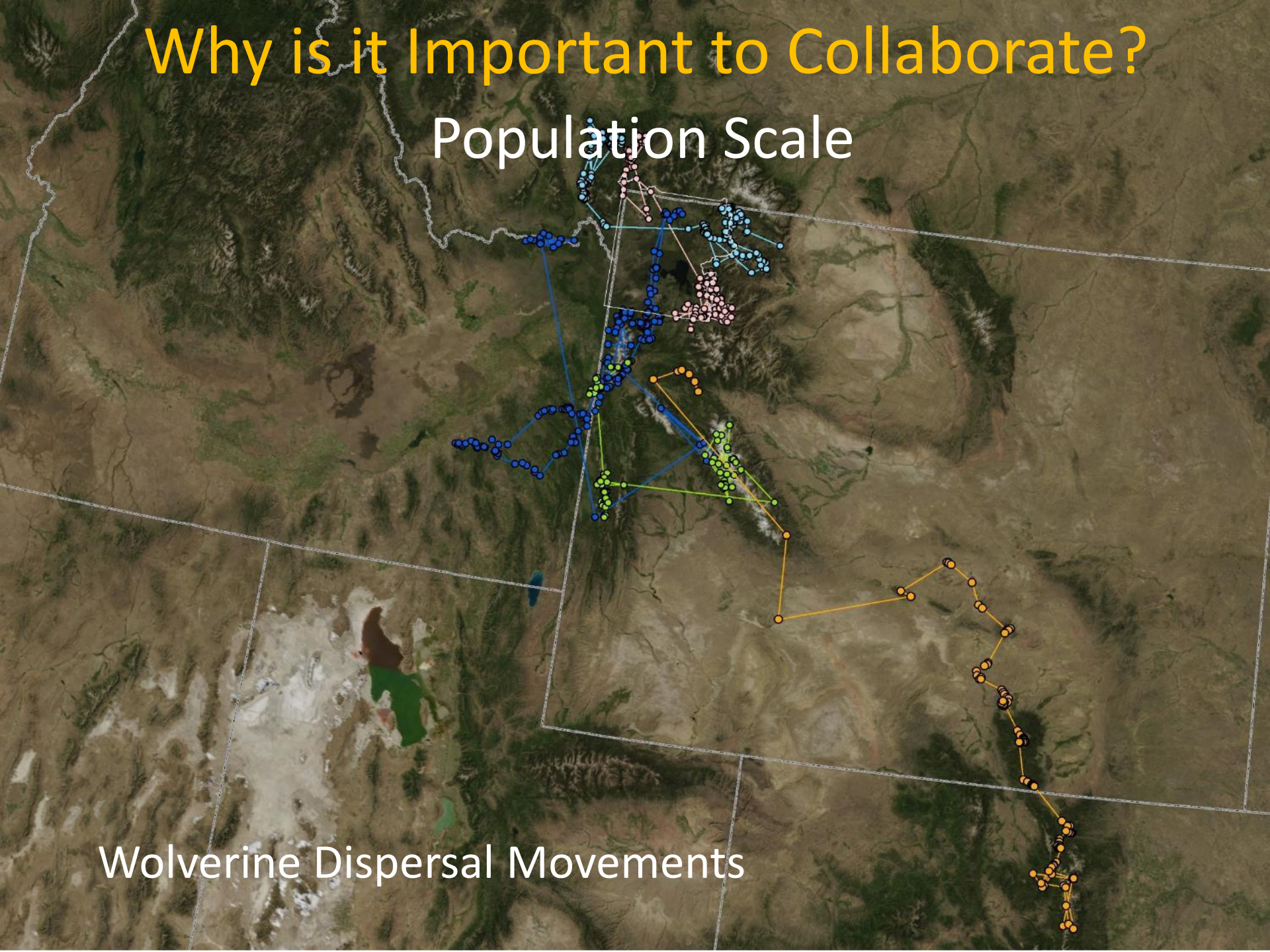


Background

Why is it Important to Collaborate?

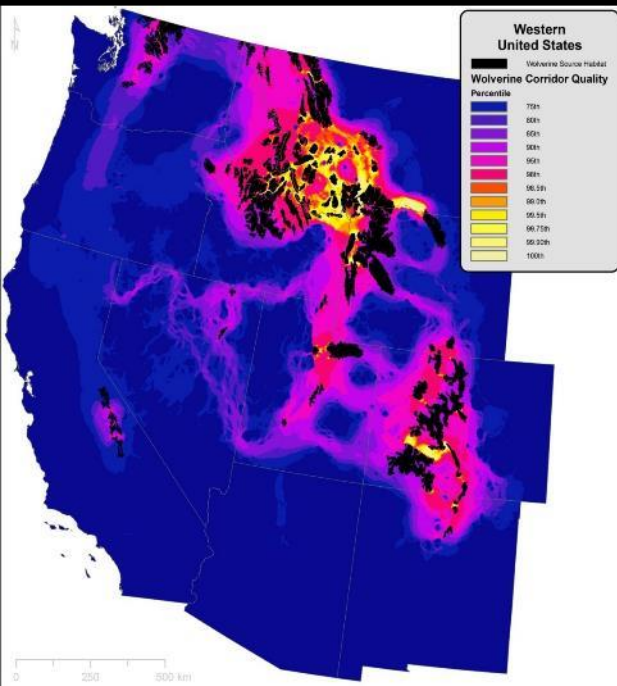
Population Scale

Wolverine Dispersal Movements

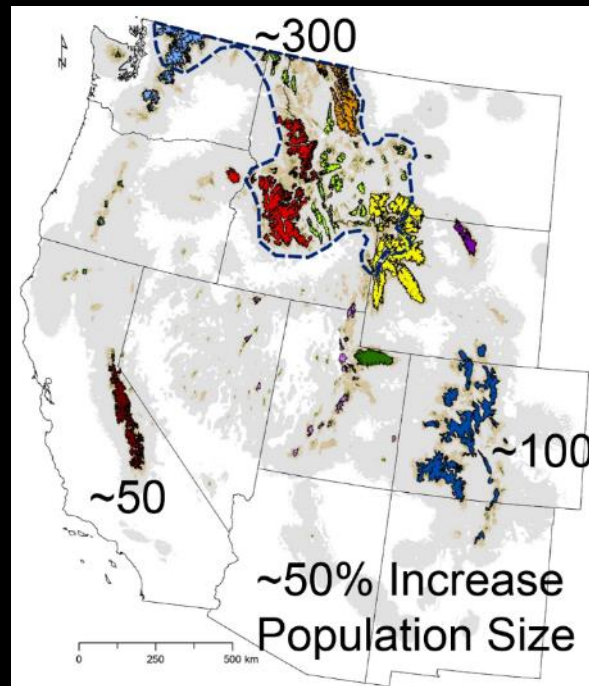


Wolverine Conservation Priorities

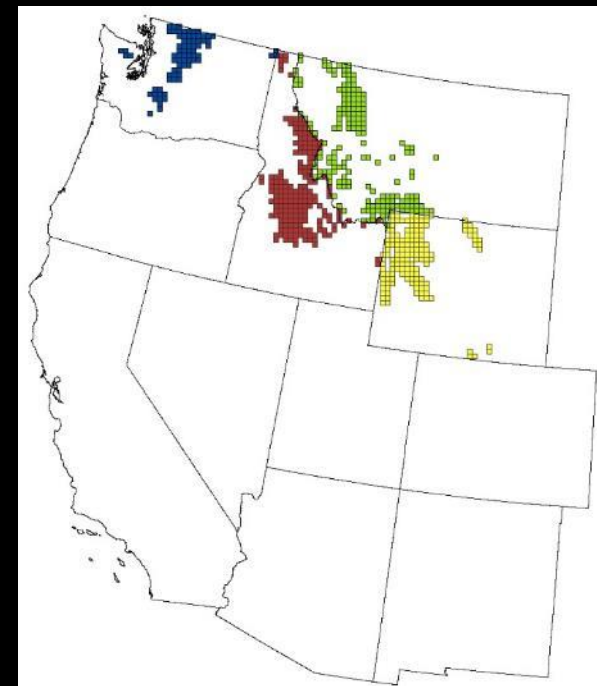
1. Connect



2. Restore



3. Monitor



Why Monitor?

1995 -2005 Wolverine Records in Lower 48

Special Section: Wolverine

Distribution and Broadscale Habitat Relations of the Wolverine in the Contiguous United States

KEITH R. AUBREY,¹ *United States Forest Service, Pacific Northwest Research Station, Olympia, WA 98512, USA*
 KEVIN S. MCKELVEY, *United States Forest Service, Rocky Mountain Research Station, Missoula, MT 59807, USA*
 JEFFREY P. COPELAND, *United States Forest Service, Rocky Mountain Research Station, Missoula, MT 59807, USA*

ABSTRACT Conservation of the wolverine (*Gadobius*) at the southern extent of its North American range requires reliable understandings of past and present distribution patterns and broad-scale habitat relations. We compiled 820 verifiable and documented records of wolverine occurrence (specimens, DNA detections, photos, and accounts of wolverine being killed or captured) in the contiguous United States from museums, the literature, and institutional archives. We spatially referenced 729 records with areal precision ≤ 1 township (93.2 km²) and temporal precision ≤ 10 years. Historical records (1827–1900) were located primarily in the western mountains and Great Lakes region. However, our data suggest that the historical distribution of wolverines in the Cascade Range and Sierra Nevada was disjoint, contradicting previous interpretations. Our results indicate that wolverine range in the contiguous United States had contracted substantially by the mid-1900s. Current records (1995–2005) are limited to north-central Washington, northern and central Idaho, western Montana, and southwestern

Table 1. Verifiable and documented records of wolverine occurrence in the contiguous United States by region and state.

Region and state	Historical records										Current records	Most recent verifiable record
	1800s	1901–1910	1911–1920	1921–1930	1931–1940	1941–1950	1951–1960	1961–1970	1971–1980	1981–1994	1995–2005	
Pacific Coast mountains												
WA	17	3	7	0	0	1	1	10	3	4	7	2003
OR	0	0	1	1	0	0	0	2	2	2	0	1992
CA	11	7	9	30	0	0	1	0	0	0	0	1922
Rocky Mountains												
ID	6	5	5	2	0	3	4	5	5	31*	16*	2005
MT	6	1	1	0	4	9	39	14	121*	149*	187*	2005
WY	10	6	1	1	0	0	0	1	0	0	12*	2005
UT	8	0	1	1	0	0	0	0	0	0	0	1921
NV	0	0	0	0	0	0	0	0	1	0	0	1972
CO	22	7	5	0	0	0	0	0	0	0	0	1919
NM	1	0	0	0	0	0	0	0	0	0	0	1860
Central Great Plains												
ND	35	0	1	0	0	0	0	0	0	0	0	None
SD	0	0	0	0	0	0	0	1	0	0	0	1962
NE	1	0	0	0	0	0	0	0	0	0	0	1857
Great Lakes region												
MN	6	0	1	2	1	0	0	1	0	0	0	1899
WI	12	1	0	1	0	0	0	0	0	0	0	1804*
MI	11	0	0	1	0	0	0	0	0	0	0	1868
Upper Midwest												
IA	0	0	0	0	0	0	1	0	0	0	0	1960
IN	2	0	0	0	0	0	0	0	0	0	0	None
OH	0	0	0	0	0	1	0	0	0	0	0	1943
Northeast												
PA	4	0	0	0	0	0	0	0	0	0	0	None
NY	3	0	0	0	0	0	0	0	0	0	0	1811
NH	0	0	2	0	0	0	0	0	0	0	0	None
VT	3	0	0	0	0	0	0	0	0	0	0	None
ME	1	0	0	0	0	0	0	0	0	0	0	None

* Includes 16 initial capture locations obtained from 1992 to 1994 during a radiotelemetry study.

* Includes 3 initial capture locations obtained in 1995 during a radiotelemetry study and 4 initial capture locations obtained from 2003 to 2005 during a radiotelemetry study.

* Includes 94 harvest records from 1974 to 1980 compiled by the MT Department of Fish, Wildlife, and Parks and 24 wolverines that were radio-collared by Hornocker and Hash (1981) in northwestern MT from 1972 to 1977.

* Includes 146 harvest records from 1981 to 1994 compiled by the MT Department of Fish, Wildlife, and Parks.

* Includes 115 harvest records from 1995 to 2004 compiled by the MT Department of Fish, Wildlife, and Parks and 49 initial capture locations obtained from 2002 to 2005 during radiotelemetry studies.

* Includes 9 initial capture locations obtained from 1998 to 2005 during radiotelemetry studies.

* Jackson (1964) found 2 wolverine specimens in a cave in southwestern WI in 1920 that he estimated had been in the deposit for >50 yr.

Take away MT harvest records and opportunistic telemetry studies:

- 42 records in 11 years
- 3.8 records/year across 4 states
- Less than 1 verified wolverine record per state per year
- Legal Challenges – State Responsibility, USFS projects, ESA

Monitoring Wolverines: More Recently



2015 CSWG

WOLVERINE METAPOPULATION MONITORING AND CONNECTIVITY IN THE U.S. ROCKY MOUNTAINS AND NORTH CASCADES



A proposal submitted to the State Wildlife Grants Competitive Grant Program

March 12, 2015

Submitted by: Western Association of Fish and Wildlife Agencies

Cooperating States: Montana, Wyoming, Idaho, and Washington

Monitoring Objective

- Collaborate at scale using standard method
- Define current baseline distribution and genetics of wolverines across current range
- Make repeatable and capable of informing changes in distribution (numbers?)
- Inform conservation actions (e.g., connectivity, restoration potential)

Methods

Methods

225 km² Cells

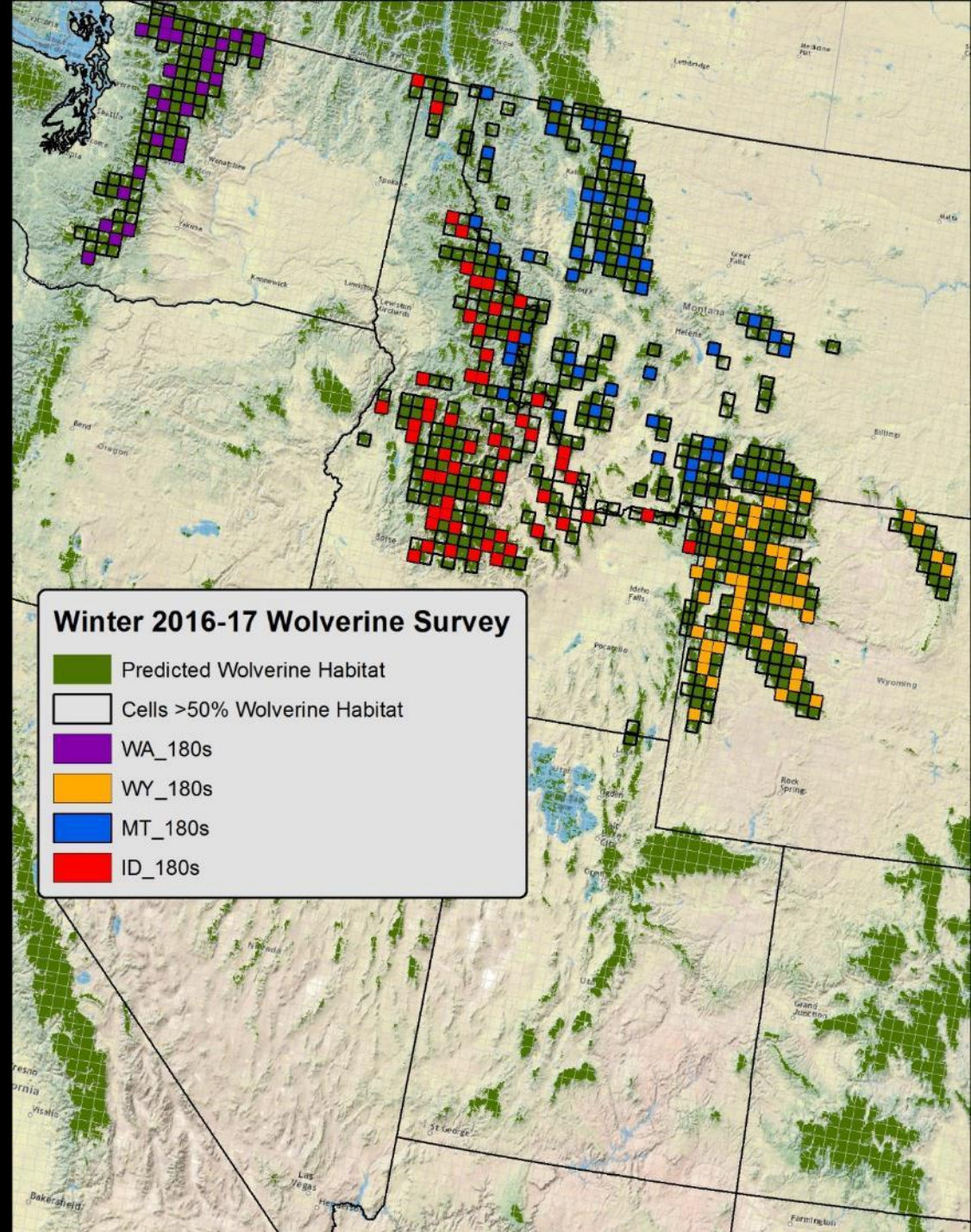
>50% Wolverine
Habitat

180 Survey Cells

1 Station/Grid Cell

Camera & Hair Snares

Dec 1 – Mar 31

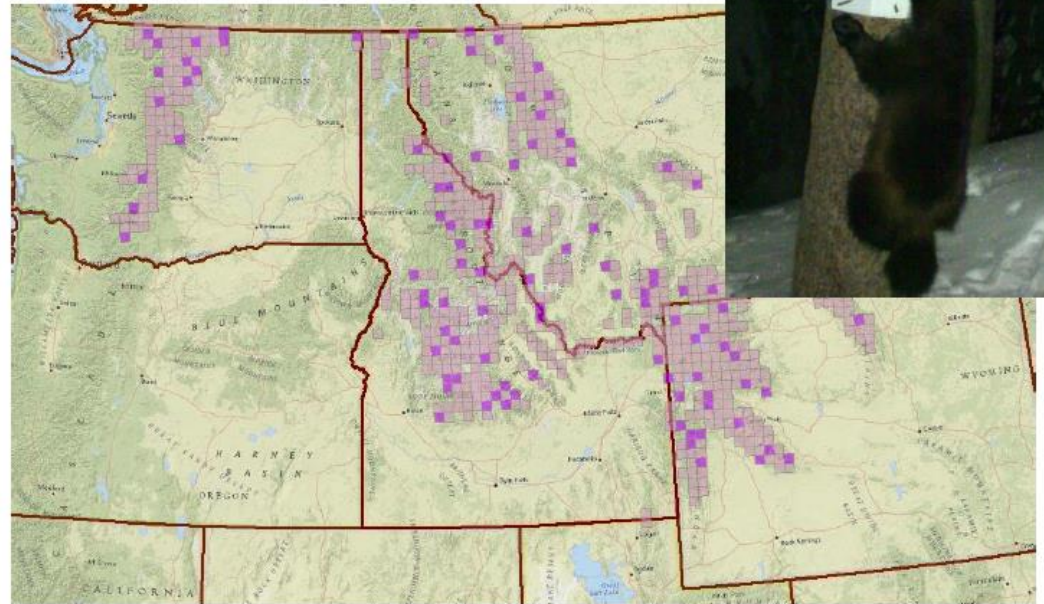


Methods

Standardized Protocol

Western States Wolverine Conservation Project Baseline Survey

Standard Operating Procedures for Camera–
DNA Stations



Western States Wolverine Working Group

Version 3.2

September 30, 2016



Washington
Department of
FISH AND WILDLIFE

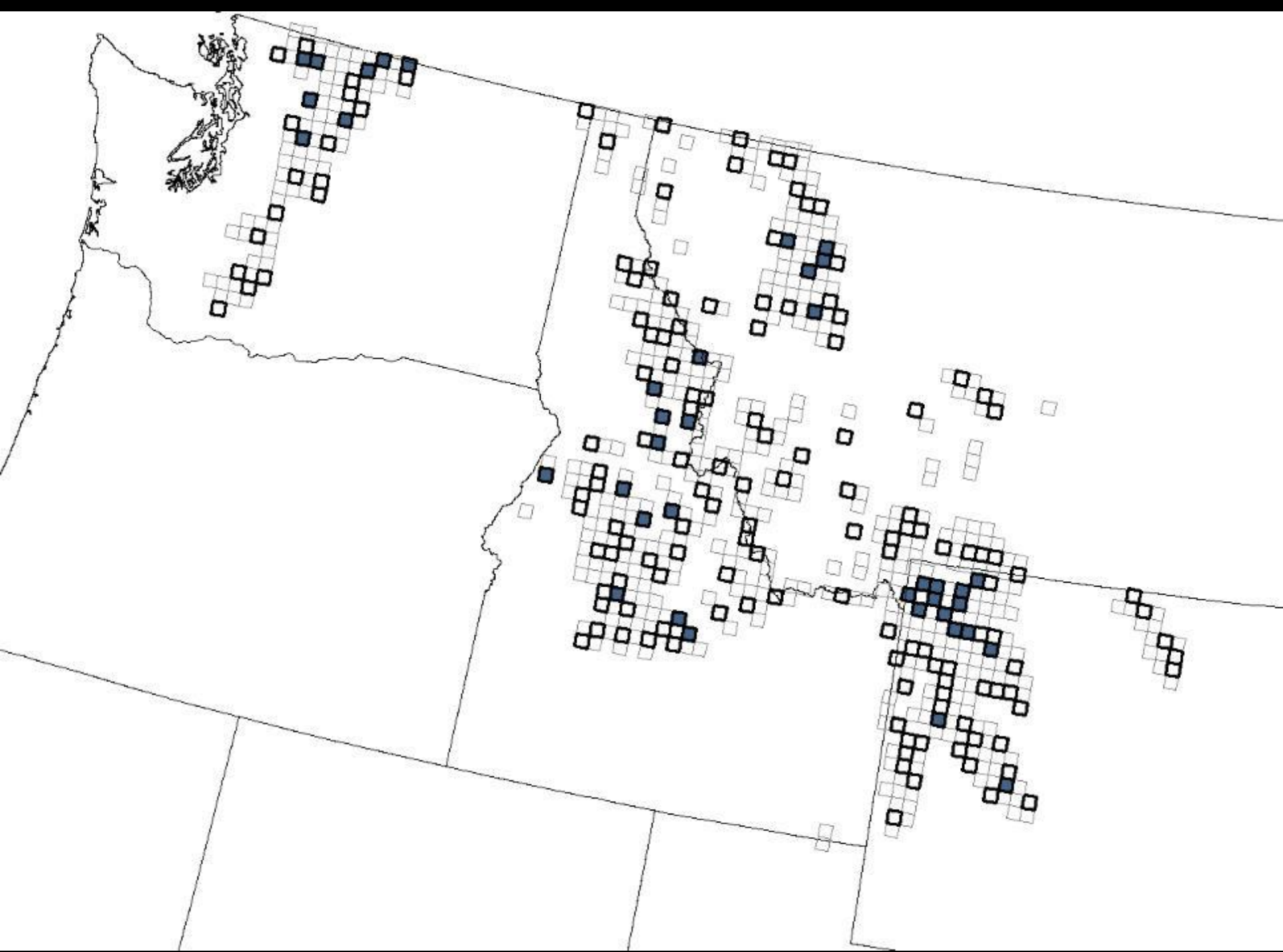
Methods

Total = 187 Stations

Accessible (148)

Inaccessible (39)





Methods



Methods

Additional “Bonus” Cells Surveyed by Public



Guidelines for Public Participation in Wolverine Surveys, Winter 2016-17 - MONTANA



Photo: Mark Packila

Western States Wolverine Conservation Program Project III – Monitoring Population Status



This project is a part of the Western Association of Fish and Wildlife Agencies effort to conserve wolverines in the western U.S. It is a collaborative effort to survey for wolverine presence across the species current range in the lower 48, and designed to be the basis for assessing stability, retraction, or expansion of the population over time. The information obtained during the survey will also be used to aid other major wolverine conservation activities such as landscape connectivity and the potential to increase population size with translocations. The public is welcome and encouraged to participate as noted within.

Methods

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Software: CPW Photo Warehouse



CPW Photo Warehouse

CPW Photo Warehouse is a custom Microsoft Access application designed to facilitate archiving, identifying, summarizing, and analyzing photo data collected from remote wildlife cameras. You can download and distribute the file under terms of the GNU General Public Use License as published by the Free Software Foundation. See the GNU Public License link below for details. Note that you must have a valid Microsoft Access license (2007 or newer) or a copy of the free Microsoft Access Runtime Version (2007 or newer) in order to use this product. For questions or comments contact cpwphotodb@gmail.com.

- [CPW Photo Warehouse 3.0 Software](#)
- [User Manual](#)
- [CPW Reciprocal Open Source License Agreement](#)

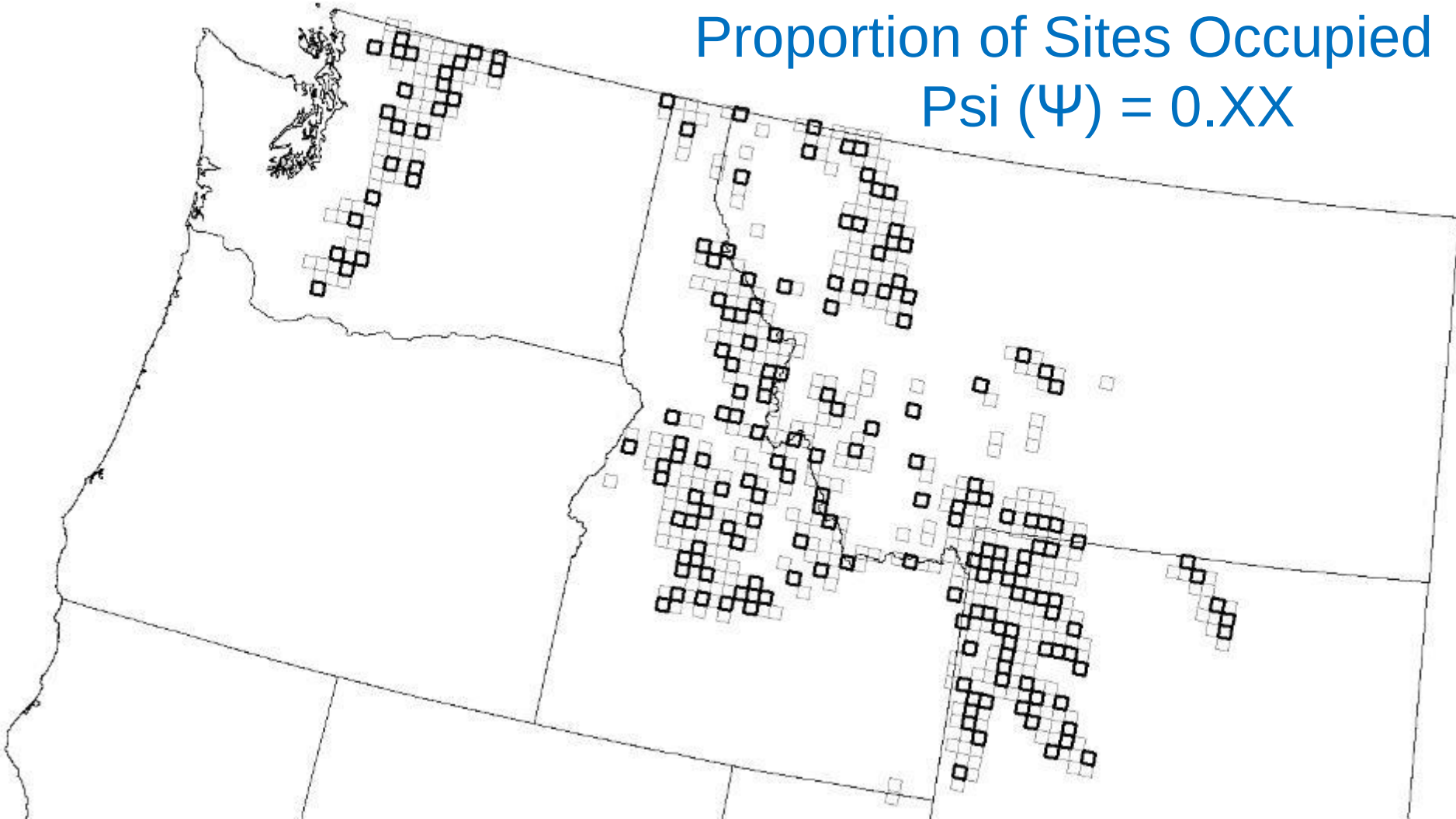


Methods



Dr. Paul Lukacs - Occupancy Analysis

Proportion of Sites Occupied
 $\Psi (\Psi) = 0.XX$



Preliminary Field Results



2017-05-14 11:10:05

M 2/5

35°F



471

RECONIX

2017-05-14 11:09:36

M 1/5

35°F



471

RECONYX

2017-05-14 11:10:25

M 3/5

35°F



471

RECONIX



2017-04-23 23:06:08

M 2/5

30 34°F



471



2016-11-23 22:13:10

M 3/5

24°F



CELL 285

RECONYX





2017-02-24 14:58:28

M 1/5

○ 22°F



471

RECONYX

2017-03-08 02:39:04

M 5/5

17°F



CELL 446

RECONYX

2017-03-09 13:09:26

M 1/5

● 26°F



485

RECONYX

2017-01-17 10:58:07

M 1/5

41°F



CELL 287

RECONYX

2017-03-21 12:16:02

M 1/5

35°F



RECONYX

CELL 536





2017-03-28 16:10:04

M 2/5

35°F



CELL 536

RECONYX

2017-02-20 8:47:23 AM

M 8/10

27°F



WTU

RECONYX

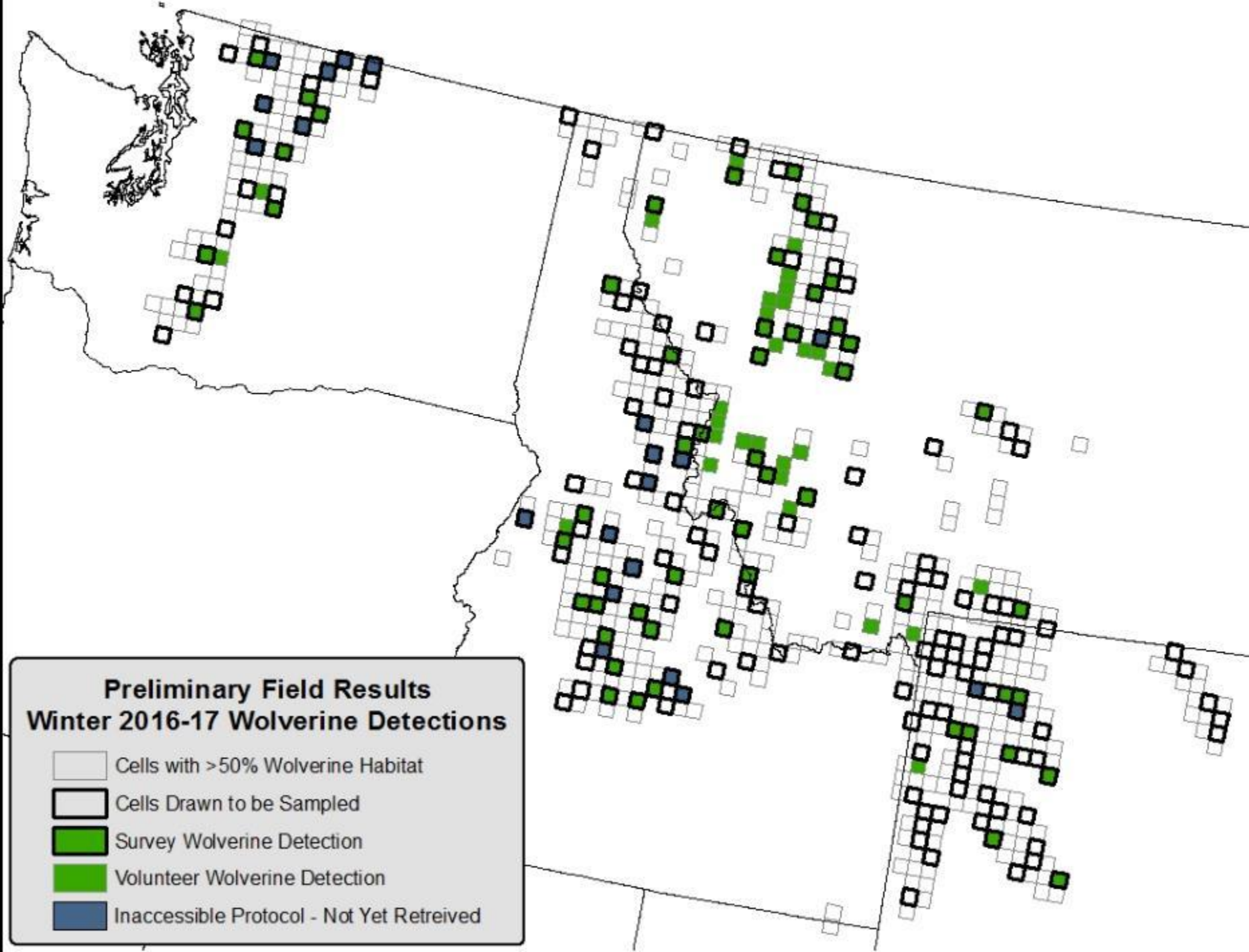
Preliminary Field Results

341,541 Photos ... so far

Cells with Wolverine Detections ... so far

- 23 Montana (+25 Volunteer Cells = 48)
- 17 Idaho (+1 Volunteer Cell = 18)
- 8 Washington (+2 Volunteer Cells = 10)
- 7 Wyoming (+2 Volunteer Cells = 9)

55 Survey Cells and 86 Total Cells ...



**Preliminary Field Results
Winter 2016-17 Wolverine Detections**

-  Cells with >50% Wolverine Habitat
-  Cells Drawn to be Sampled
-  Survey Wolverine Detection
-  Volunteer Wolverine Detection
-  Inaccessible Protocol - Not Yet Retrieved

Preliminary Field Results

Genetic Samples ... so far

Table 1. Preliminary number of genetic samples collected during the survey

	Montana	Idaho	Wyoming	Washington	Total
Number of Hair Samples	593	380	195	0	1110
Preliminary Number ID'd as Wolverine	93	57	18	0	157
Preliminary Number ID'd as Marten	208	116	71	0	371

Utility of Dataset

- Distribution
 - > Gaps/Potential Restoration Areas
- Occupancy
 - > Factors (human/habitat) influencing distribution
 - > Changes in distribution (numbers?) over time
- Genetics
 - > Contemporary genetic structure
 - > Degree of connectivity and features influencing
 - > Maps of key connectivity areas for easements
 - > Changes in genetics and connectivity over time

Considerations for the Future

- Forest Carnivore Survey?
- Public Participation?

Forest Carnivore Survey?

- Lynx SSA
- Fisher SSA
- Wolverine SSA
- 2 Species Marten
- Montane Fox SSA:
 - Sierra Nevada
 - Cascade
 - Rocky Mountain



Public Participation



22°F 01/31/2017 09:06AM A 354 DON7

Public Participation



36°F



02/09/2017

11:35AM

A 354

DON7

Next Steps

Fall 2017 – Meeting to Finalize Occupancy Analysis

Winter 17-18 – Occupancy Analysis

Spring 2018 – Submission of Occupancy Manuscript

- Genetics to Individual?
- Large-scale Genetic Analysis?
- Integrate Genetics into Connectivity?
- Marten Genetic Dataset?
- Multi-species Forest Carnivore Survey?

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Montana

Beaverhead-Deerlodge Forest
Bitterroot National Forest
Custer-Gallatin National Forest
Flathead National Forest
Glacier National Park
Kootenai National Forest
Lewis & Clark-Helena Forest
Lolo National Forest

Washington

Mt. Baker-Snoqualmie National Forest
North Cascades National Park
Okanogan-Wenatchee National Forest

Wyoming

Bighorn National Forest
Bridger-Teton National Forest
Shoshone National Forest

Idaho

Boise National Forest
Caribou-Targhee National Forest
Clearwater National Forest
Nez Pearce National Forest
Panhandle National Forest
Payette National Forest
Salmon-Challis National Forest
Sawtooth National Forest



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Questions ?

