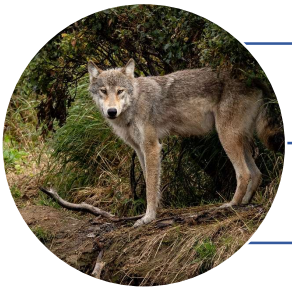
Region I Predator-Prey Research

Board of Game Meeting Wrangell, AK January 23, 2026

1

Wolf Research in Southeast Alaska – Region I



Predation patterns

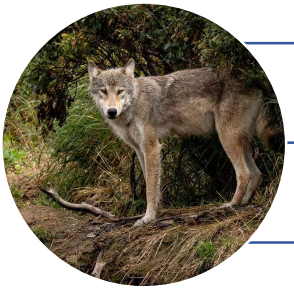
Spatial patterns

Range-wide genetic structure

2

2

Wolf Research in Southeast Alaska – Region I



Predation patterns

Spatial patterns

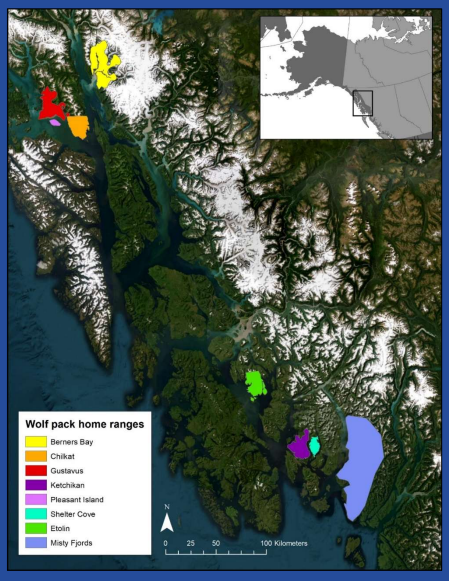
Range-wide genetic structure

3

3

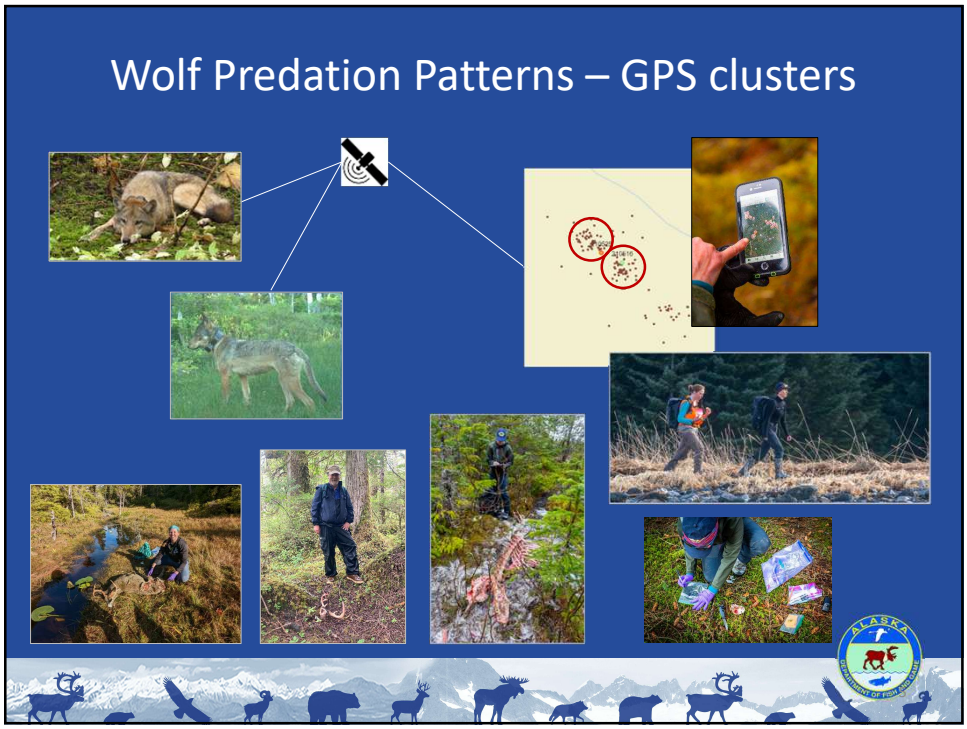
Wolf Predation Patterns

- Seasonal and regional differences in predation rates
- 2018–2024, 23 GPS collared wolves
- 8 wolf packs, 5 study areas
- Average home range size = 148 mi^2

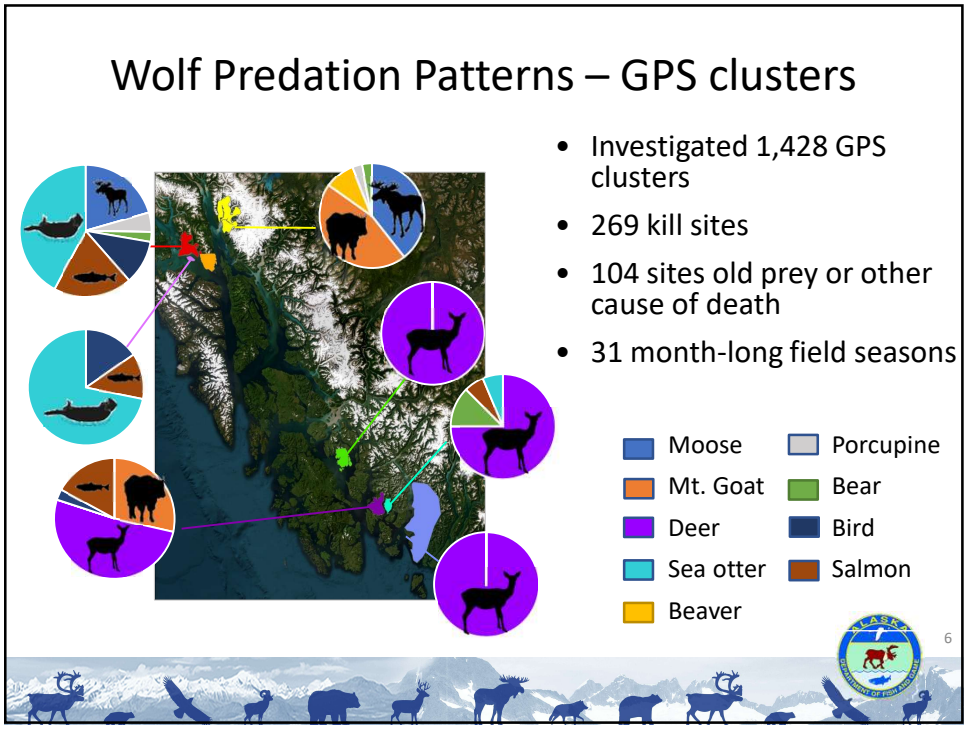


4

4


Wolf Predation Patterns – GPS clusters

5


Wolf Predation Patterns – GPS clusters
• Investigated 1,428 GPS clusters
• 269 kill sites
• 104 sites old prey or other cause of death
• 31 month-long field seasons
Moose
Mt. Goat
Deer
Sea otter
Beaver
Porcupine
Bear
Bird
Salmon
6

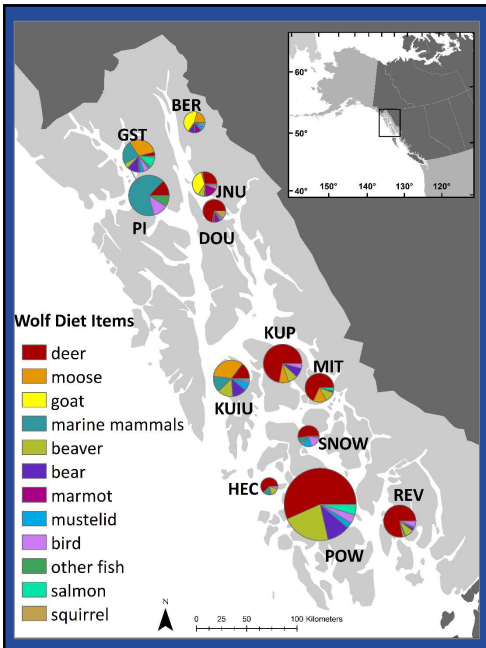
6

Wolf Predation Patterns – Scat Analysis

- DNA from wolf scat to identify prey species
- Detects rare prey more accurately
- 860 scats, 2010–2018

Oregon State University OSU

7



Wolf Predation Patterns – Scat Analysis

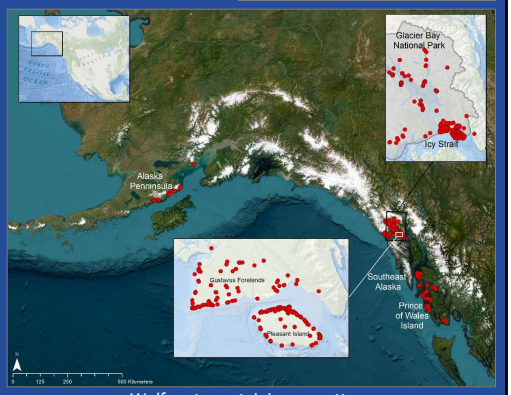
- 55 prey species
- Ungulates are main prey
- Beaver, black bears, and marine mammals are important alternate prey

Roffler, G.H., et al. 2021. Ecosphere. 12:e03297.

8

Wolf Predation Patterns

- Sea otters subsidize wolves
- 76 wolf-killed sea otters in Gustavus and Pleasant Island
- Sea otters in ~20% of wolf scats in Glacier Bay, Katmai coast, and outer islands of Prince of Wales Island



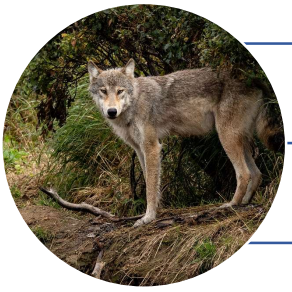
Wolf scats containing sea otters

Roffler, G.H., et al. 2023. PNAS. 5(120):e2209037120; Eriksson, C.E. et al. 2024. Ecology and Evolution. 14(4):11266

9

9

Wolf Research in Southeast Alaska – Region I



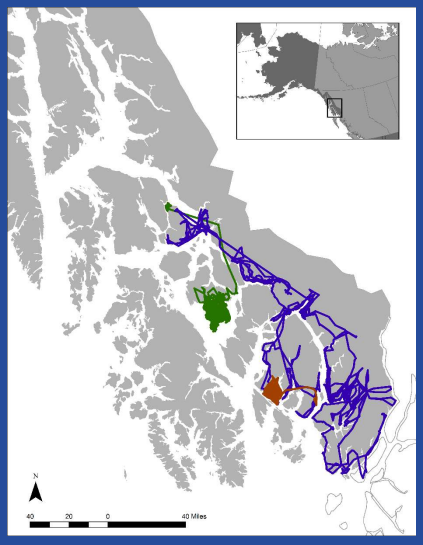
Predation patterns

Spatial patterns

Range-wide genetic structure

10

10



Wolf Spatial Patterns

Dispersal

- 5 out of 23 wolves dispersed
- Dispersal distances = 30–2,025 miles
- Dispersal duration = 5 days–1 year
- Water crossings = 0.5–4 miles
- Wolf fates = killed by other wolves, trapped, settled with pack

11

11

Wolf Spatial Patterns

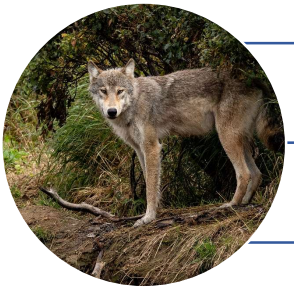
Gregovich et al. 2025, Oecologia, 207(3):40

- How does logging and changes in forest vegetation affect where and how fast wolves travel?
- GPS collared wolves – GMU 2
- Wolves select and move faster through open habitats
- These areas are also where deer are more exposed and at higher risk of predation.
- Wolf selection of roads and old vs. young forest varied by individual

12

12

Wolf Research in Southeast Alaska – Region I



Predation patterns

Spatial patterns

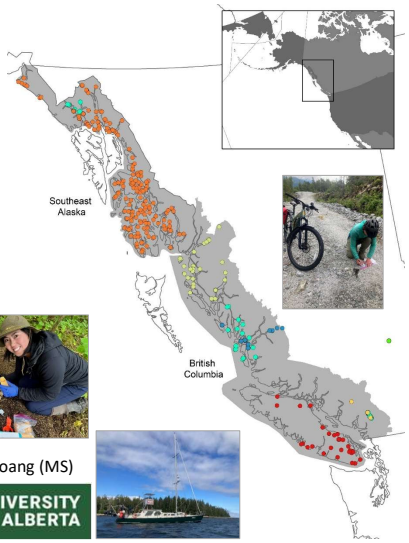
Range-wide genetic structure

13

13

Range-wide Genetic Structure

- Wolf range = ~85,000 miles^2, 900 miles north to south
- Is there gene flow across the border?
- Differences in genetic diversity between AK and BC?
- 1,551 samples collected
- 453 genotypes, 319 wolves



Michelle Hoang (MS)

UNIVERSITY OF ALBERTA

14

14

Wolf Research on Prince of Wales Island – GMU 2

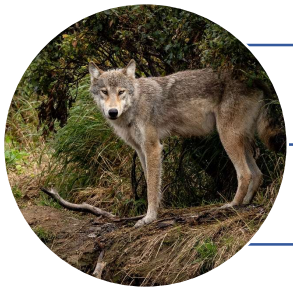
Focal area of management concern

- History of logging and habitat change
- ESA and other legal challenges

15

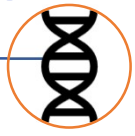
15

Wolf Research on Prince of Wales Island – GMU 2



PAST: How past events shaped the wolf population

PRESENT: Expanded population sampling

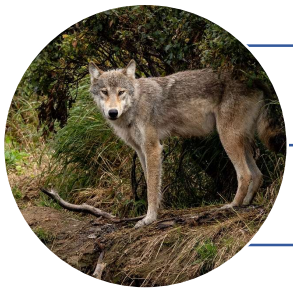


FUTURE: Genetic monitoring & new tools

16

16

Wolf Research on Prince of Wales Island – GMU 2



PAST: How past events shaped the wolf population

PRESENT: Expanded population sampling

FUTURE: Genetic monitoring & new tools

17

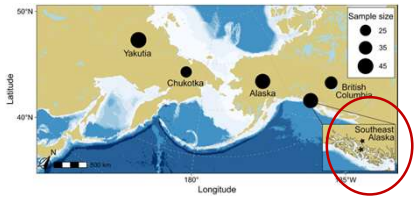
17

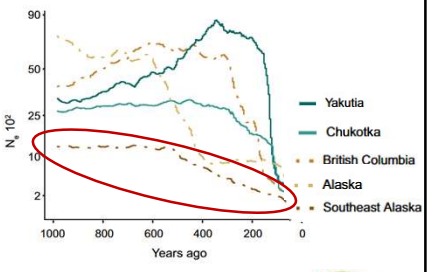
The Past

Pacheco, C. et al. 2022, Molecular Ecology 31 (18), 4851-4865

Deep History

- Wolves colonized Southeast Alaska
  - ~ 16,000 years ago
- Isolated by geography and glaciers
- Steady decline began ~600 years ago
- Resulted in high levels of inbreeding in Southeast Alaska

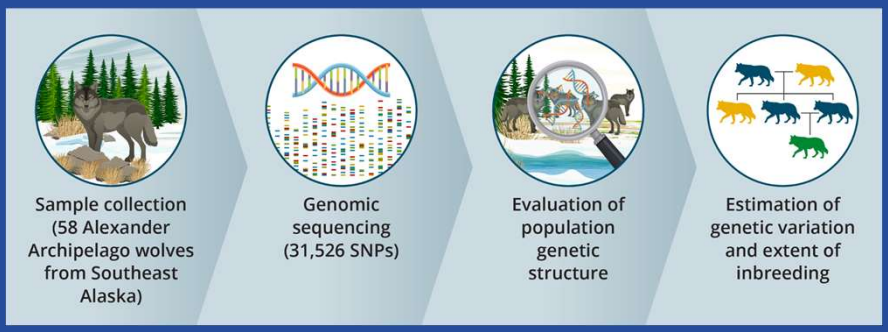




18

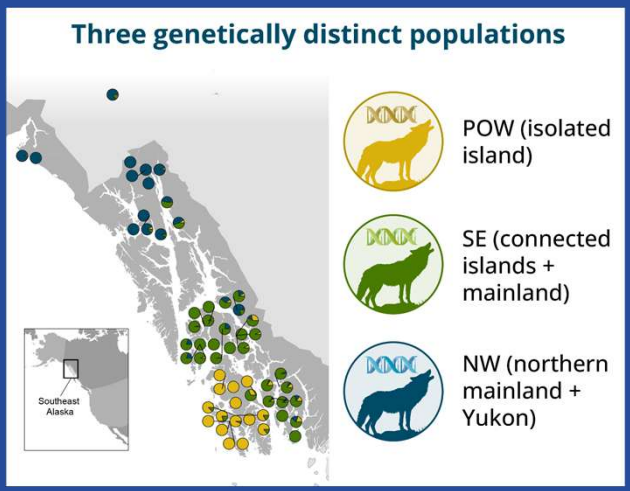
18

Genetic Research



19

Genetic Research



Zarn, K. et al. 2025, Evolutionary Applications, 18 (8), e70144

20

Genetic Research

POW wolves

- Isolated and genetically distinct
- Genetic diversity
- Inbreeding (F_{ROH} = 0.39)

- Long-term population decline
- High bottleneck in the 1970s

Only one immigrant detected, indicating rare gene flow

Increase in inbreeding after the bottleneck

Zarn, K. et al. 2025, Evolutionary Applications, 18 (8), e70144

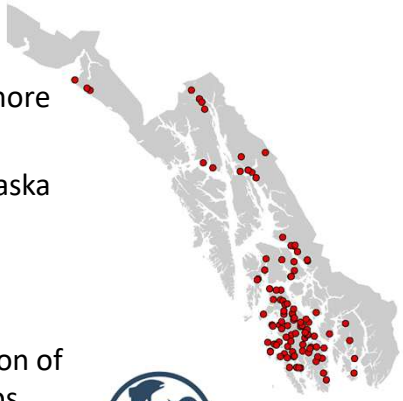
21

21

Genetic Research – Next Steps

Expanded genetic markers

- Whole genome sequencing – more information
- Sequencing more Southeast Alaska wolves
- Changes in population size and migration patterns over time
- History of isolation or connection of island and mainland wolf groups
- Whether inbreeding could reduce wolf fitness



National Genomics Center
FOR WILDLIFE AND FISH CONSERVATION

22

22

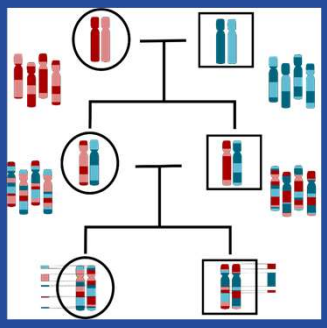
Genetic Research – Next Steps

Inbreeding

- Could lead to inbreeding depression (negative fitness effects)
- Difficult to measure in wild populations
- Research to measure genetic load

Management considerations

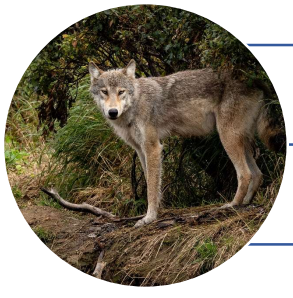
- What does success look like?
- Establish monitoring programs to assess success of management actions



23

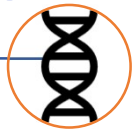
23

Wolf Research on Prince of Wales Island – GMU 2



PAST: How past events shaped the wolf population

PRESENT: Expanded population sampling



FUTURE: Genetic monitoring & new tools

24

24

Expanded population sampling

Use of detection dogs

- Detection dogs help find wolf scat
- DNA in scat identifies individual wolves
- Diet profiles from scat

Boat-based sampling

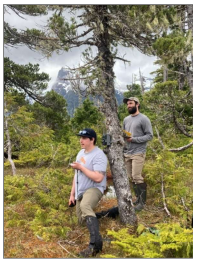
- 22 islands, 2023–2026
- >1,400 scats, 60 cameras
- Will estimate wolf minimum counts in unmonitored areas
- Deer sign surveys

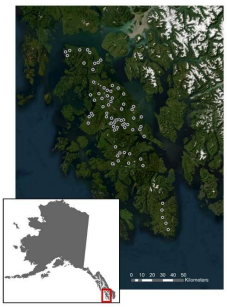
Kayla Fratt and Barley

Expanded population sampling

Camera-based methods

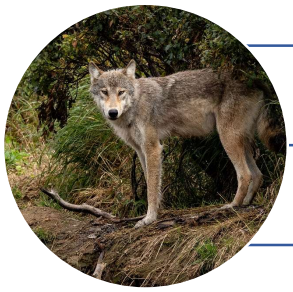
- Estimate populations of wolves, deer, and black bears
- Focus on previously unmonitored areas, 2022–2026
- 96 cameras
- 5 million images
- Number of images: Wolves = 432, deer = 17,821, black bears = 596





Students:
Tony Zambito (MS)
Sarah Trujillo (PhD)

Wolf Research on Prince of Wales Island – GMU 2



PAST: How past events shaped the wolf population

PRESENT: Expanded population sampling

FUTURE: Genetic monitoring & new tools

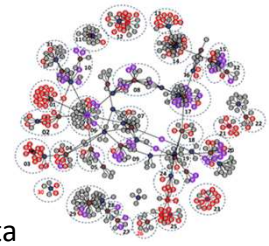
27

27

Genetic monitoring & new tools

Identification of individual wolves and family relationships

- Using DNA from hair and scat



Enhanced population estimates

- Utilizing more types of samples

Monitoring reproduction

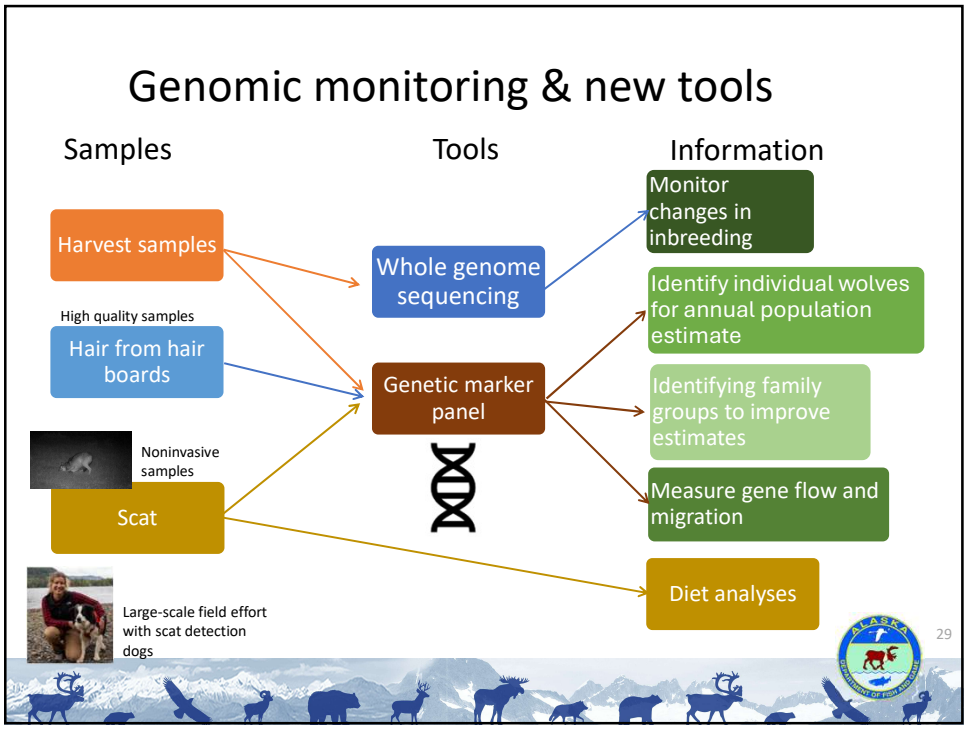
- Field studies and family relationship data

Sequencing wolves regularly

- Monitoring changes in inbreeding and genetic diversity over time

28

28


Genomic monitoring & new tools
Samples
Tools
Information
Harvest samples
High quality samples
Hair from hair boards
Noninvasive samples
Scat
Large-scale field effort with scat detection dogs
Whole genome sequencing
Genetic marker panel
Monitor changes in inbreeding
Identify individual wolves for annual population estimate
Identifying family groups to improve estimates
Measure gene flow and migration
Diet analyses
29

29


Thanks to:
U.S. FISH & WILDLIFE SERVICE
NATIONAL PARK SERVICE
UAF UNIVERSITY OF ALASKA FAIRBANKS
WILDLIFE RESTORATION
FOREST SERVICE US DEPARTMENT OF AGRICULTURE
National Genomics Center
BRITISH COLUMBIA Ministry of Forests, Lands and Natural Resource Operations
University of Victoria
UNIVERSITY OF CALGARY
Oregon State UNIVERSITY OSU
UNIVERSITY OF MONTANA
Alaska Cooperative Fish & Wildlife Research Unit
UNIVERSITY OF ALBERTA
NSU
30

30

Thanks to:

Alaska Department of Fish and Game:

Abby McAllister
Alexandra Lewis
Anthony Crupi
Boyd Porter
Chris Krenz
Dan Eacker
Dave Gregovich
Frank Robbins
Gretchen Roffler
Hilary Wood
Jacob Hall
Jenell Temple-Larsen
Jillian Soller
Keenan Wright
Kit Cunningham
Kris Larson
Lauri Jemison
Lucas Baranovic
Lucas Beck
Lyda Rees
Maddie Kombrink
Mallory LeBlanc
Michelle Sutton/Duncan
Natalie Dawson
Neil Barten
Rosemary McGuire
Ross Dorendorf
Roy Churchwell
Stephanie Bogle
Stephanie Sell
Susannah Woodruff
Tessa Hasbrouck
Tim Spivey
Tom Schumacher
Tony Johnson
Tory Rhoads
Ben Williams

Pilots:

Eric Main
Brendan Rogers
Chuck Schroth

University Alaska Fairbanks:

Shawn Crimmins
Tony Zambito
Sarah Trujillo

Oregon State University:

Taal Levi
Jenn Allen
Charlotte Eriksson
Ellen Dymit
Kayla Fratt

Gustavus:

Eric Syrene
Jen Landry
Larry Landry
Sean Neilson
Mike Halbert
Bud Rosenbruch

USFS:

Taylor Cunningham

NPS:

Julie Hower
Kelsey Griffin
Kiana Young
Tania Lewis

Craig:

Michael Kampnich
Ellen Hannan
Brian Castle

National Genomic Center:

Cate Quinn
Alex Fraik
Dan Vanderpol
Michael Schwartz
Kristy Pilgrim
Sophie Preckler-Quisquater

University of Alberta:

Michaelle Hoang
Mark Boyce

31

Thanks to:

32