Movi:
Domestic Wildlife Interaction
Alaska Board of Game
2017

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Domestic Wildlife Interface

- Greater Yellowstone Area - Brucellosis
- Michigan – Tuberculosis
- Domestic Poultry – Avian Influenza
- Alaskan Reindeer Herds – Caribou
- Livestock – Wildlife Predators
- Delta Farms - Plains Bison
- Canadian Farms – Elk

- Domestic Sheep – Bighorn Sheep

Reported Cause for Concern

- Pneumonia outbreaks caused some large die-offs (75-90% mortality) of bighorn sheep in western Canada and the U.S. but some report losses ~ 5%
- Reduced lamb survival for years following the pneumonia outbreaks impacts herd sustainability
- Wild sheep have a low resistance to pathogens found in the respiratory tract of domestic sheep and goats

Respiratory Disease

- Pneumonia Outbreak: **Multifactorial** and involve **Multiple Pathogens**

- *Mycoplasma ovipneumoniae* (*Movi*)
- Pasteurella bacteria
  - *Pasteurella haemolytica*
  - *P. haemolytica*
  - *P. trehalosi*
- *Fusobacterium necrophorum*
- Other bacteria (*Truperella pyogenes*)
- Respiratory viruses

Alaska: Unique Situation

- Alaska does not seem comparable to the situations in western U.S. or Canada
- Smaller number of farms and livestock
  - 13 animals/farm (~2,000 sheep, goats)
  - Low density so ⇩ probability for interaction
- Fewer importations/year (~19 imports; < 110 animals/year) 5 animals/permit*
- No free grazing, animals are contained /fenced, so some degree of separation


WASH.
OREG.
CALIF.
San Francisco
NEV.
IDAHO
MONT.
WYO.
UTAH
ARIZ.
COLO.
N. MEX.
N. DAK.
S. DAK.
NEBR.
KANS.
OKLA.
TEXAS
MINN.
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MO.
ARK.
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WIS.
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TENN.
ALA.
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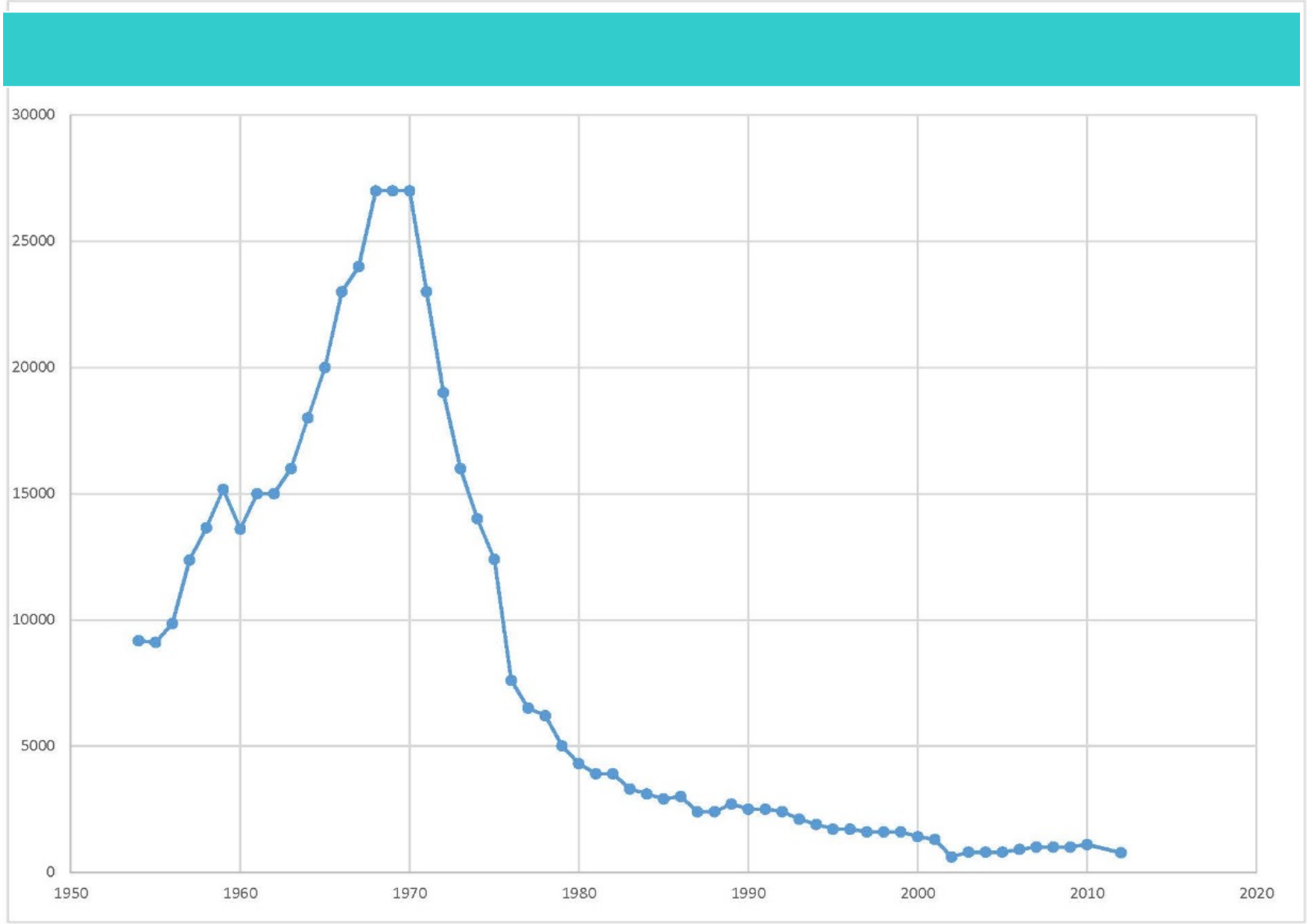
W. VA.
PA.
N.Y.
MD.
DEL.
N.J.
CONN.
R.I.
MASS.
VT.
N.H.
ME.
Jacksonville
0
250
500
MILES

Must Evaluate the Whole Picture

- Wild sheep populations increasing in U.S.
  - 1960s ~ 18,000 / 2007 ~ 72,000 / 2014~ 85,000
- Value of Wild Sheep as a resource
  - Economically: Tourism, Hunting
  - Very important to Alaska
- Value of domestics
  - Economically $ 800/yr (fiber, food)
  - Management: state and federal land: grazing

Domestic Sheep Populations in Alaska



Wild Sheep Working Group

- Organized by the Alaska Farm Bureau and the Wild Sheep Foundation
- Discuss options and strategies for prevention of wildlife livestock interaction
  - Separation – no contact
  - Movi free status
- Evaluate prevalence of Movi in domestic sheep and goats – **need for data**

Study Outline

- Using USDA, NASS statistics develop a sampling plan to evaluate AK farms
- Domestic livestock sample collection:
  - Veterinarians to collect samples
    - Client/patient confidentiality – used farm code
  - Follow protocol established in previous studies
    - Nasal, conjunctival swabs and serum
  - Samples submitted:
    - Animal Disease Research, ARS, USDA
    - Washington State Animal Diagnostic Lab

Study Protocol

- Voluntary participation
  - Sample plan to evaluate current farms
- A Survey will be completed by farmer
  - Focus on management husbandry practices
- All animals tested on the farm, repeated sampling at ~ 4 and 8 weeks
  - Duplicate samples collected (~ 20%)
- Data returned to the Veterinarian/client and summary data to State Veterinarian

Sources: U.S. Bureau of the Census, U.S. Department of Agriculture.
Note: All boundaries and names are as of January 1, 2012. For data collection purposes, one or more county equivalent entities (borough, census area, city, municipality) are included in an agriculture census area.

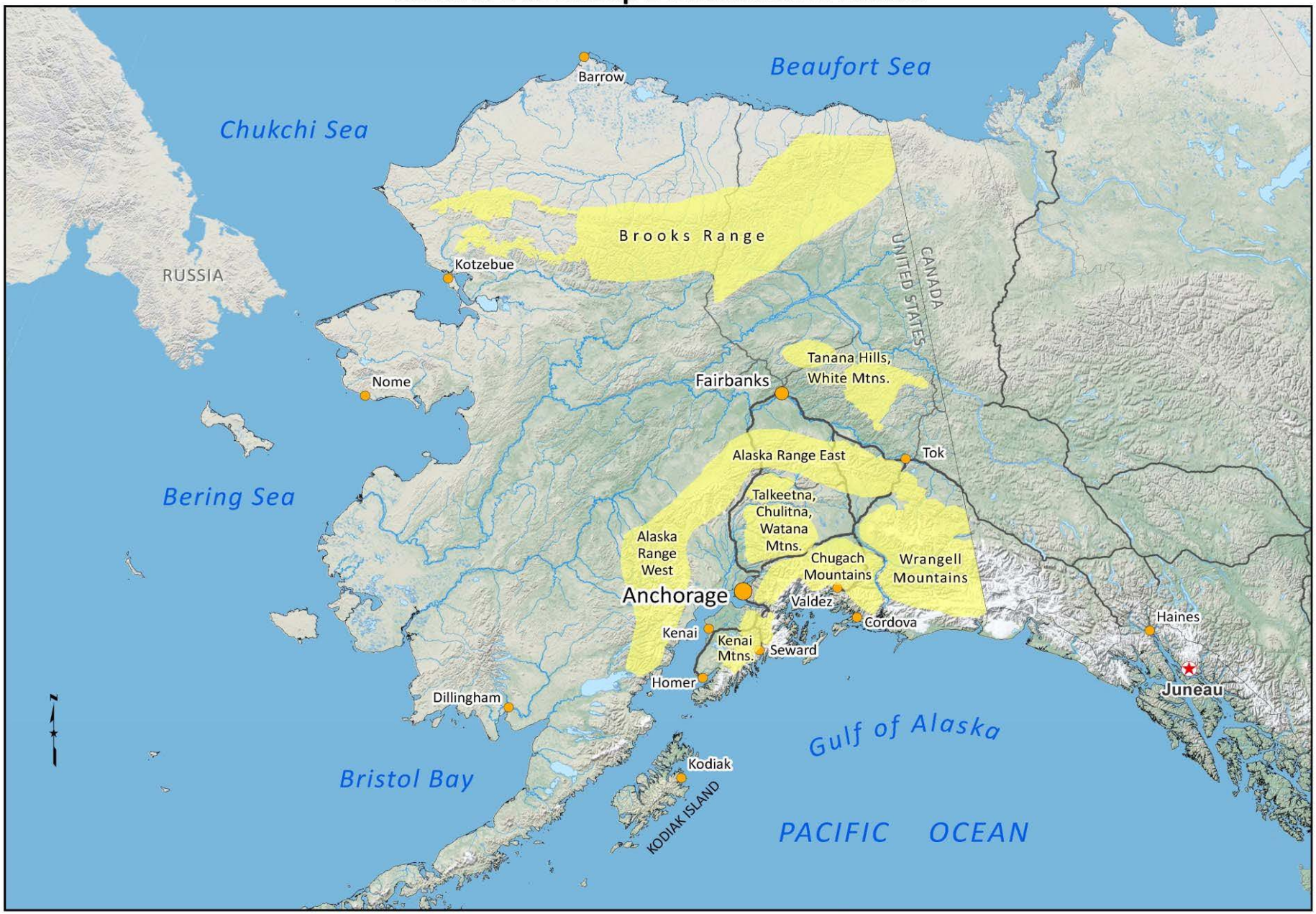
USDA NASS 2012 Farm Census

# Farms	Aleutian -Kodiak Islands	Southcentral Anchorage-MatSu-Valdez-Cordova	Kenai Peninsula	Interior/ Fairbanks Delta - Yukon to Canada	Southeast	Total farms
Sheep	2	25	7	14	2	50
Goat	1	27	10	15	3	56
Total	3	52	17	29	5	106
# Animals						Total animals
Sheep	42	326	147	216	42	773
Goat	6	343	52	177	18	595
Total	48	669	199	393	60	1,368

Concurrently a Second Study

- ADF&G will provide samples from
  - Wild Sheep, Goats, Muskox
  - Wild ungulates (moose, deer, caribou)
- This study will also include captive wildlife
  - Zoos, exhibitions, tourist attractions
- Unique opportunity to evaluate domestic livestock and multiple wildlife species in the same environment

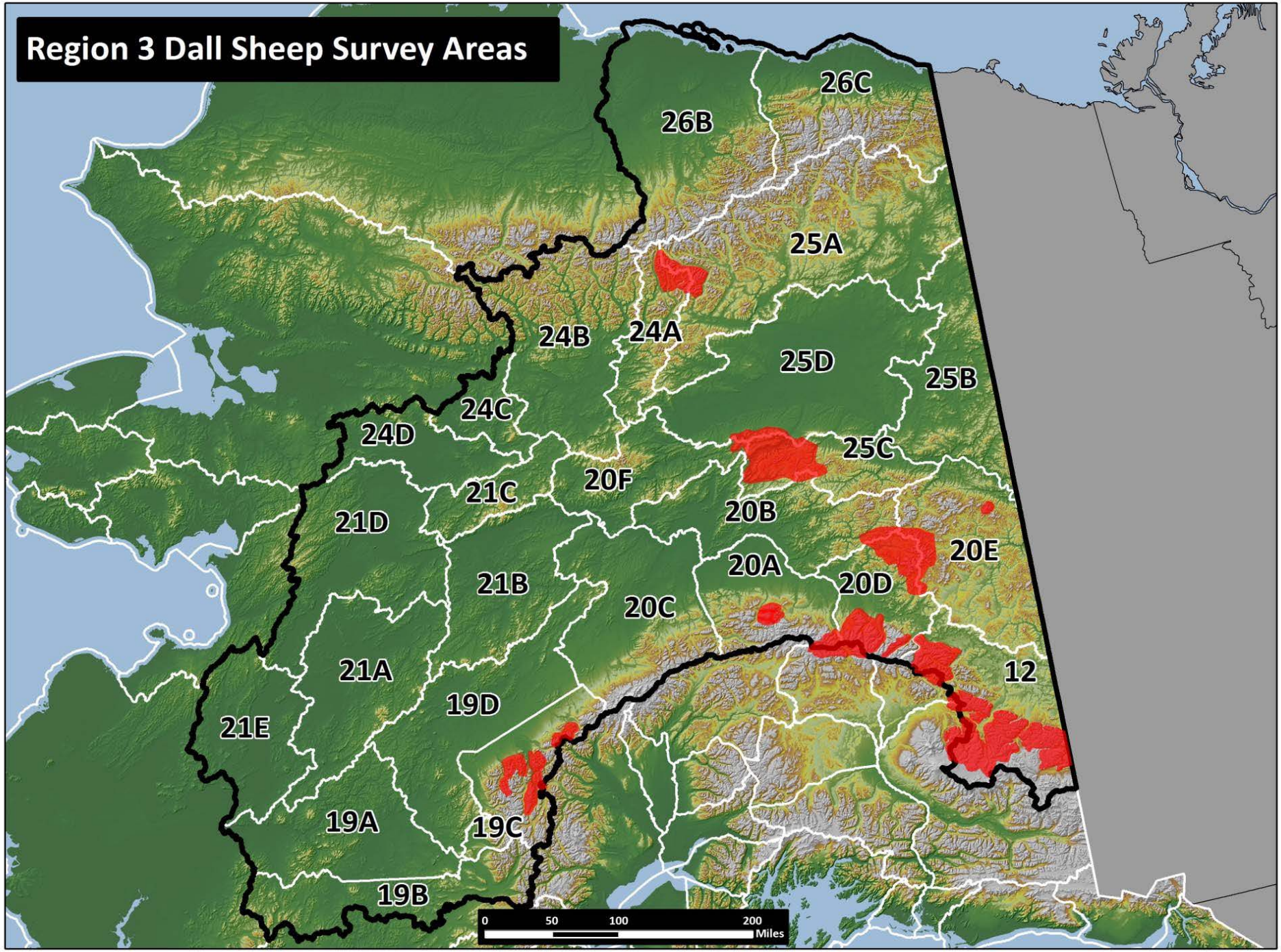
General Dall Sheep Distribution in Alaska



Data Sources:
ADFG
ESRI Data & Maps, 2004

0 50 100 200 300 400 500 Miles

Alaska Dept. of Fish & Game
2014


Region 3 Dall Sheep Survey Areas
26C
26B
25A
24B
24A
25D
25B
24C
24D
25C
20F
21C
20B
21D
20E
20A
20D
21B
20C
12
21A
19D
21E
19A
19C
19B
0
50
100
200
Miles

Test Procedures

- **Nasal Swabs:** tested for Movi genetic material using PCR
  - Complex test procedure that may vary between labs
  - What does a (+)detection mean?
    - Presence of bacteria not necessarily infection

- **Serum:** tested for antibodies to Movi
  - Currently no test is validated for goats
  - What does a (+) result mean?
    - Exposure not infection

Preliminary Results for this Study

- 27 farms and 376 total animals
  - 6 of 27 were sheep farms
  - 2 of 27 had both sheep and goats
  - 19 of 27 were goat farms

- 7 of 27 farms (26%) Movi was detected
  - More commonly found on sheep farms - consistent with some other studies

- 20 of 27 (74%) had no Movi detected

Preliminary Summary Data

- For this study, the premises that tested (+) for Movi:
  - No animals were clinically ill
  - Rarely did one animal test (+) at all 3 collection times
  - In most cases the # of animals testing (+) varied at each collection time
  - There is a lot we do not know about this bacteria

Preliminary Summary Data

	#	0		MC-I		Movi		Indet	
1	366	303	83%	49	13%	14	4%	0	0%
2	330	256	78%	47	14%	18	5%	7	2%
3	265	200	75%	54	20%	7	3%	2	1%
Avg:			79%		16%		4%		

Next Steps

- Dependent on the study results
  - Await results of wildlife study
  - Continue to collect samples from livestock
  - Use data for science based decision
- Evaluate options for mitigation action
  - No action
  - “Disease free status”
  - Separation

What are the costs?

- Continued collaboration and dialogue

Summarize

- All participants recognize the value of wild life resources to Alaska
- Producers participated unsure what the results (prevalence of the pathogen)
- Producers, veterinarians not totally compensated for their time and efforts
- The State has contributed considerable efforts (time, funding, resources)
- UDSA ARS also contributed greatly
- Use an Ecosystem approach, consider all impacts and consequences