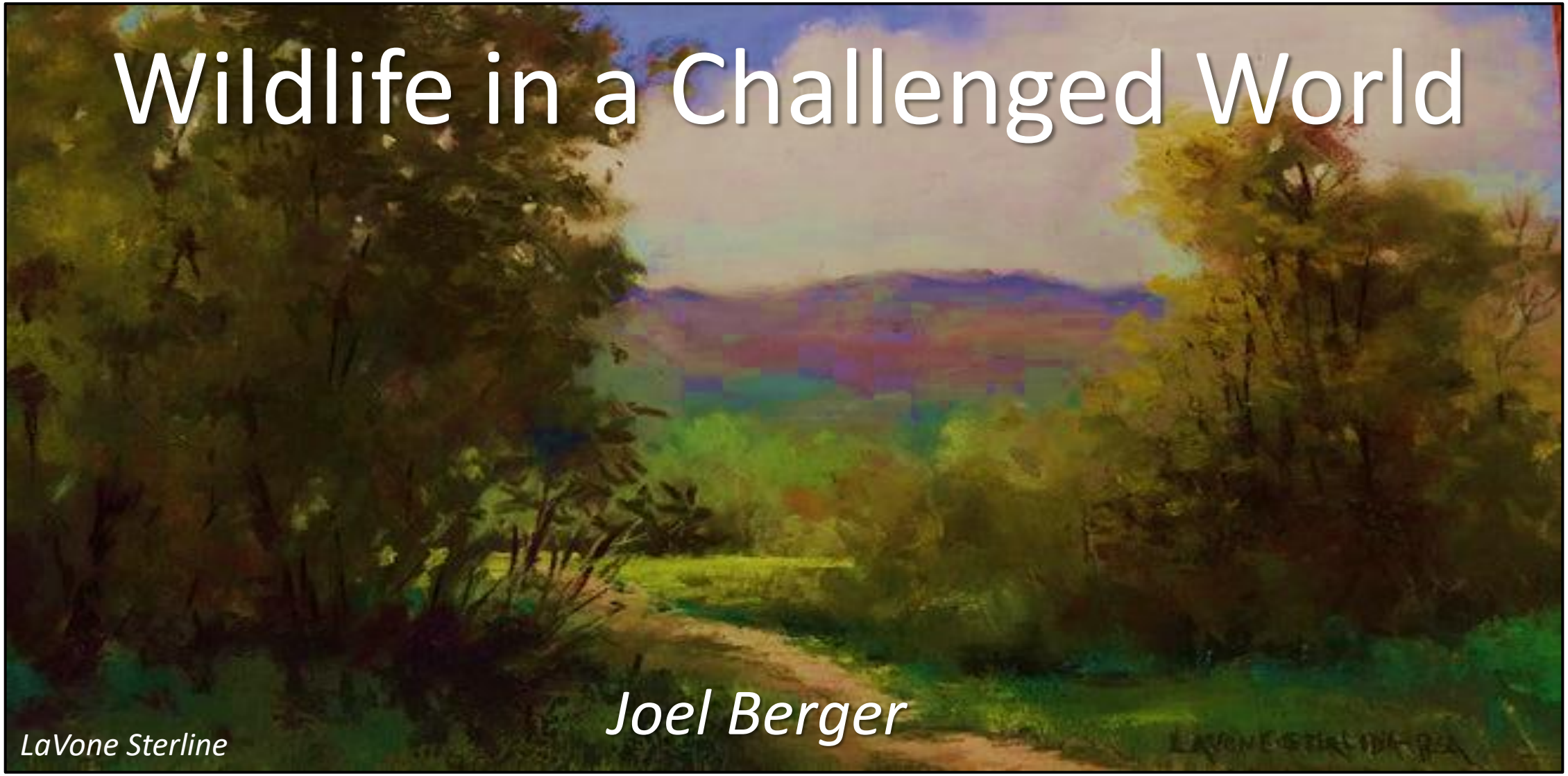
Wildlife in a Challenged World



Joel Berger

LaVone Sterline

Colorado State

WCS

Questions

Colorado State

WCS

Questions

Colorado State

WCS

Questions

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Questions

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People, Land, Commitment - Ancestral Ties

Hopi, Zuni, Navajo, San Juan Southern Paiute, Kaibab Paiute, Ute, Ute Mountain Ute, Jemez Pueblo & Acoma Nations.

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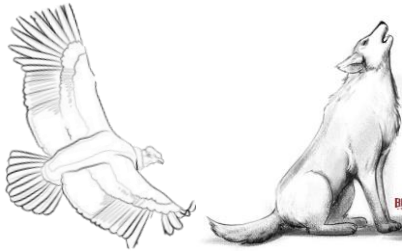
Appreciating Nature



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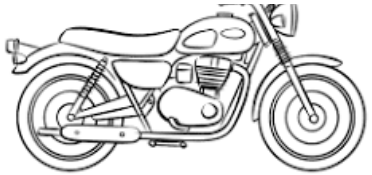
Appreciating Nature



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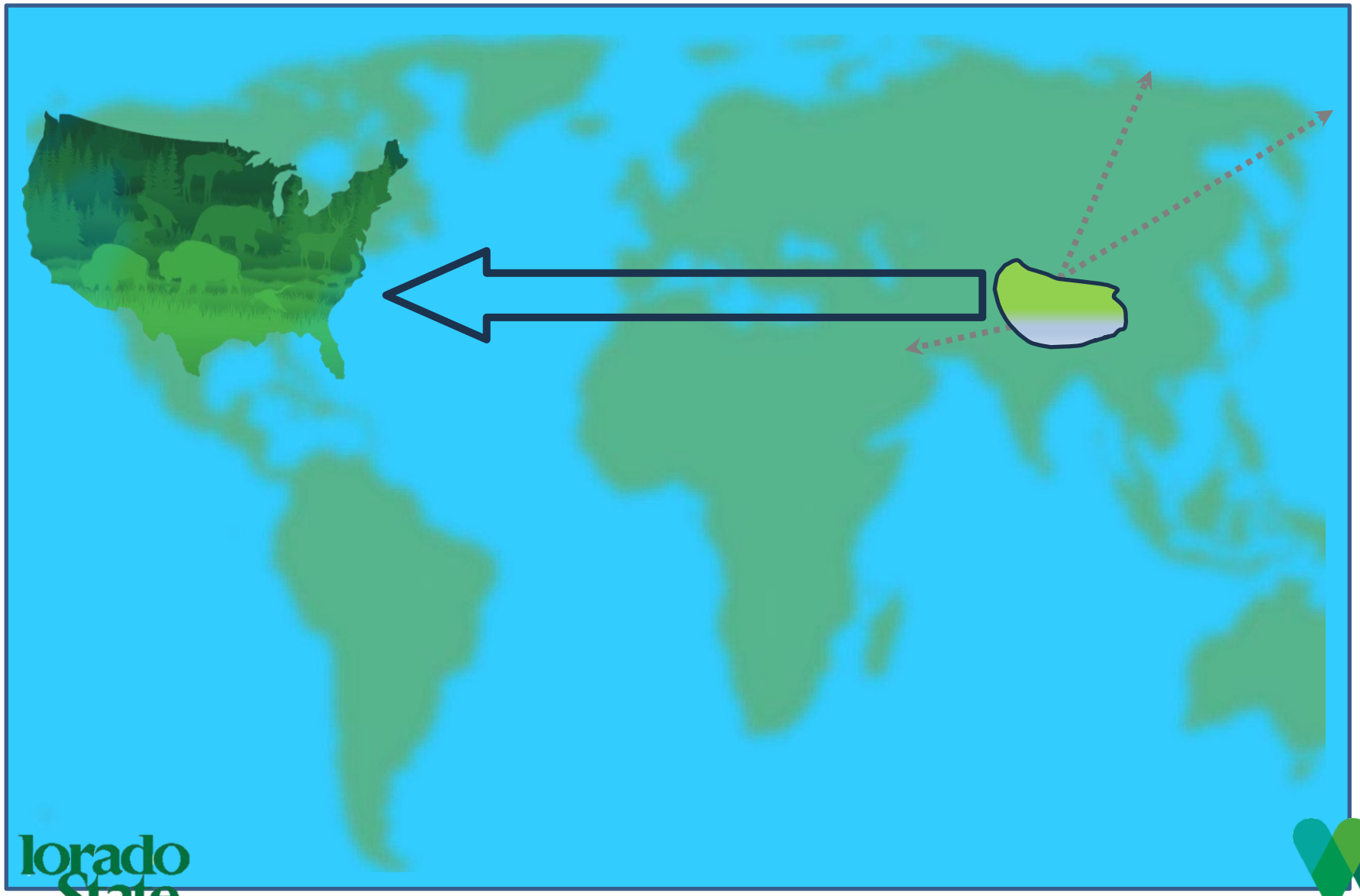
Darker Picture

- Eight billion
- Biodiversity disaster
- Apathy
- Despair
- Big $$
- Equity challenged

Today's Geography



Three Vignettes – *Excitement, Reality, Hope*

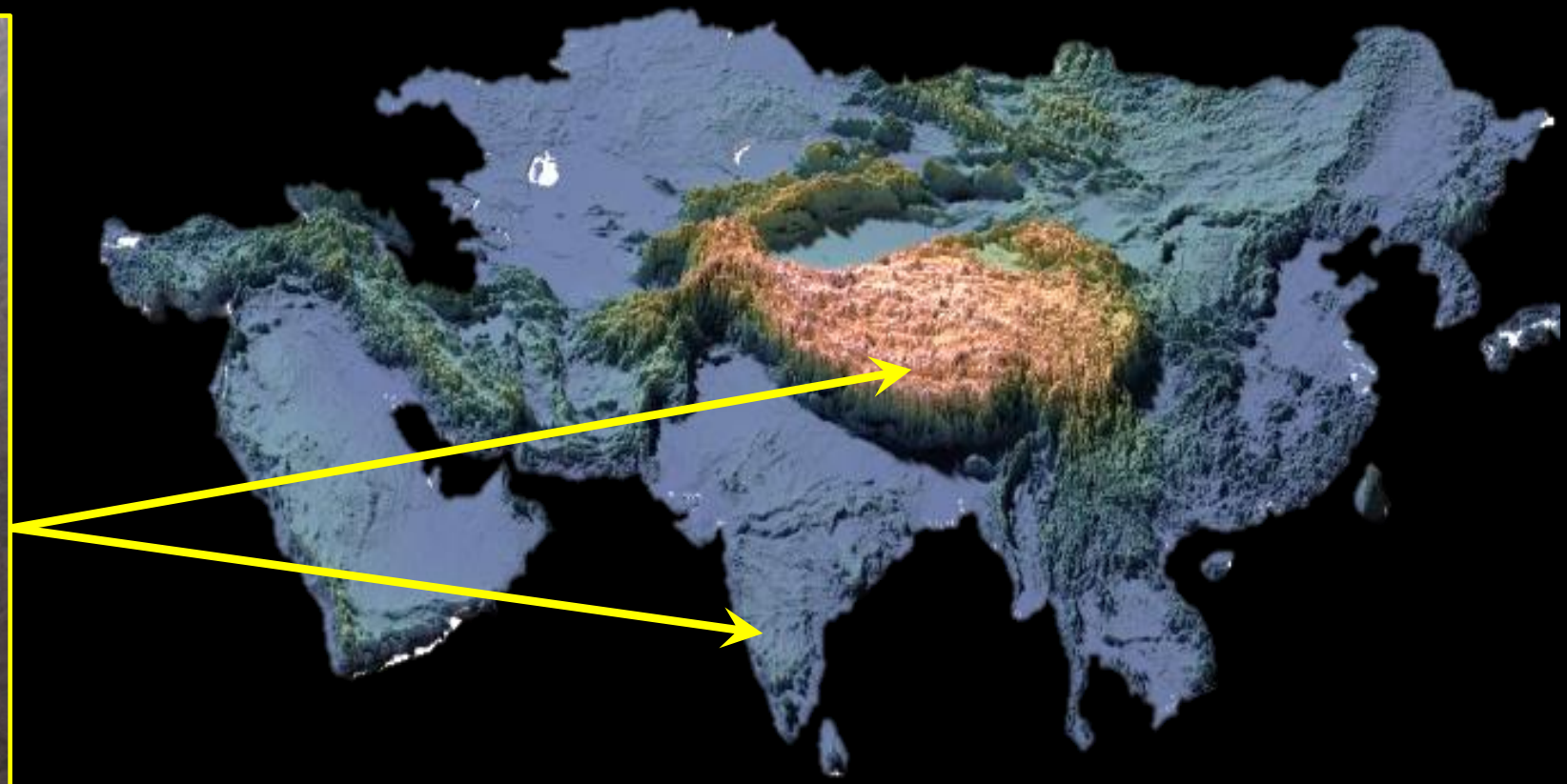
Three Vignettes – *Excitement, Reality, Hope*

Scientific Discovery – Fascinating Finds

- NA Porcupine
- Maned Rat
- Greenland Shark
- Great crested flycatcher

Images: Wiki Commons, B. Taylor , Mammal Watching

Tahr *(Mts & Hills)*



- Himalayas
- Nilgiri Hills
- New Zealand

Tahr *(Oman)*

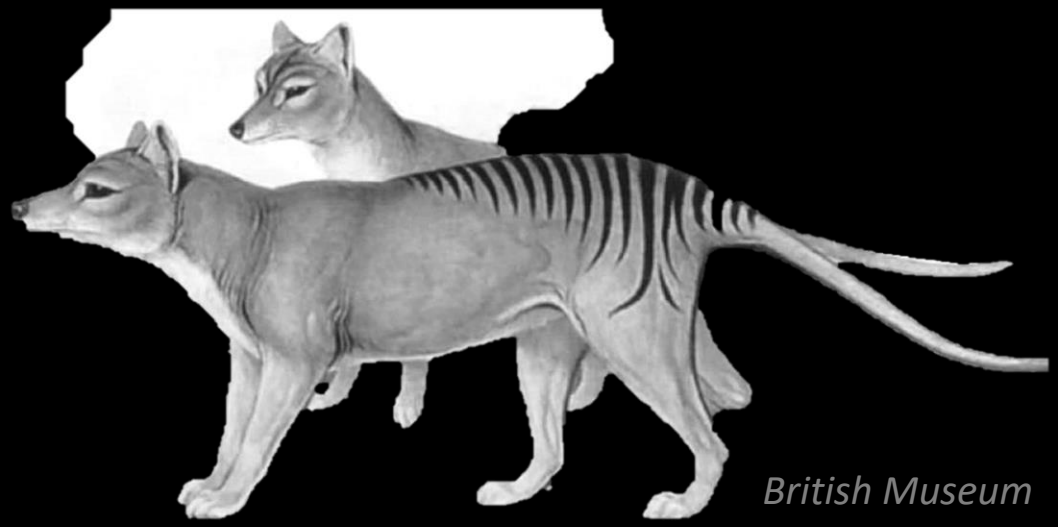
Tahr *(Oman)*

Video: courtesy S. Ross

A Daunting Course Ahead

- Confusion about our society
- Staying Focused
- Balance

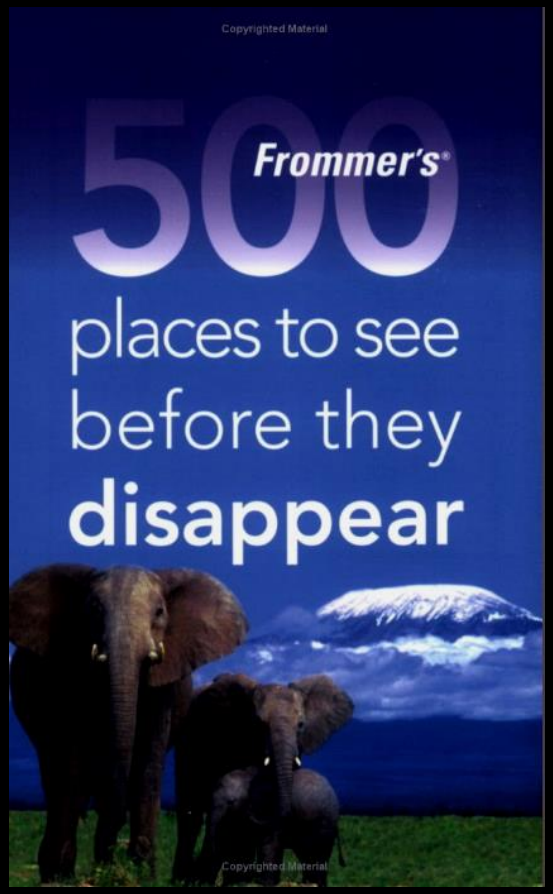
Conservation was born as a “crisis discipline”



British Museum

Conservation was born as a "crisis discipline"

British Museum



We have created a culture of looking backwards

The Visible Earth

2010

80% Urban

(S. Reed; WCS 2018; Sanderson et al. 2018)

Source: NASA – Earth Program

Opportunities?

Source: NASA – Earth Program

2010

80% Urban

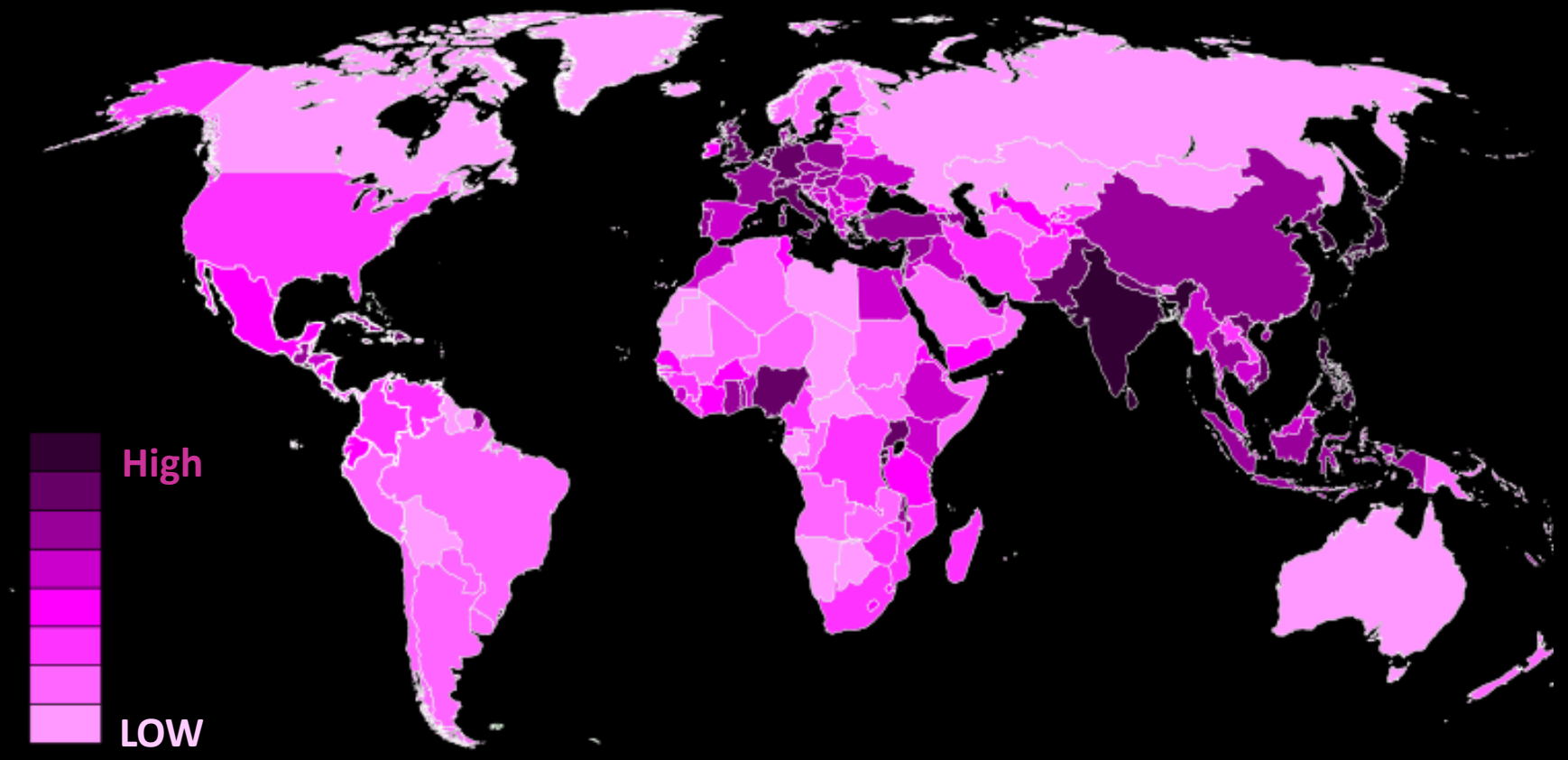
2050

90% Urban

(S. Reed; WCS 2018; Sanderson et al. 2018)

Opportunities

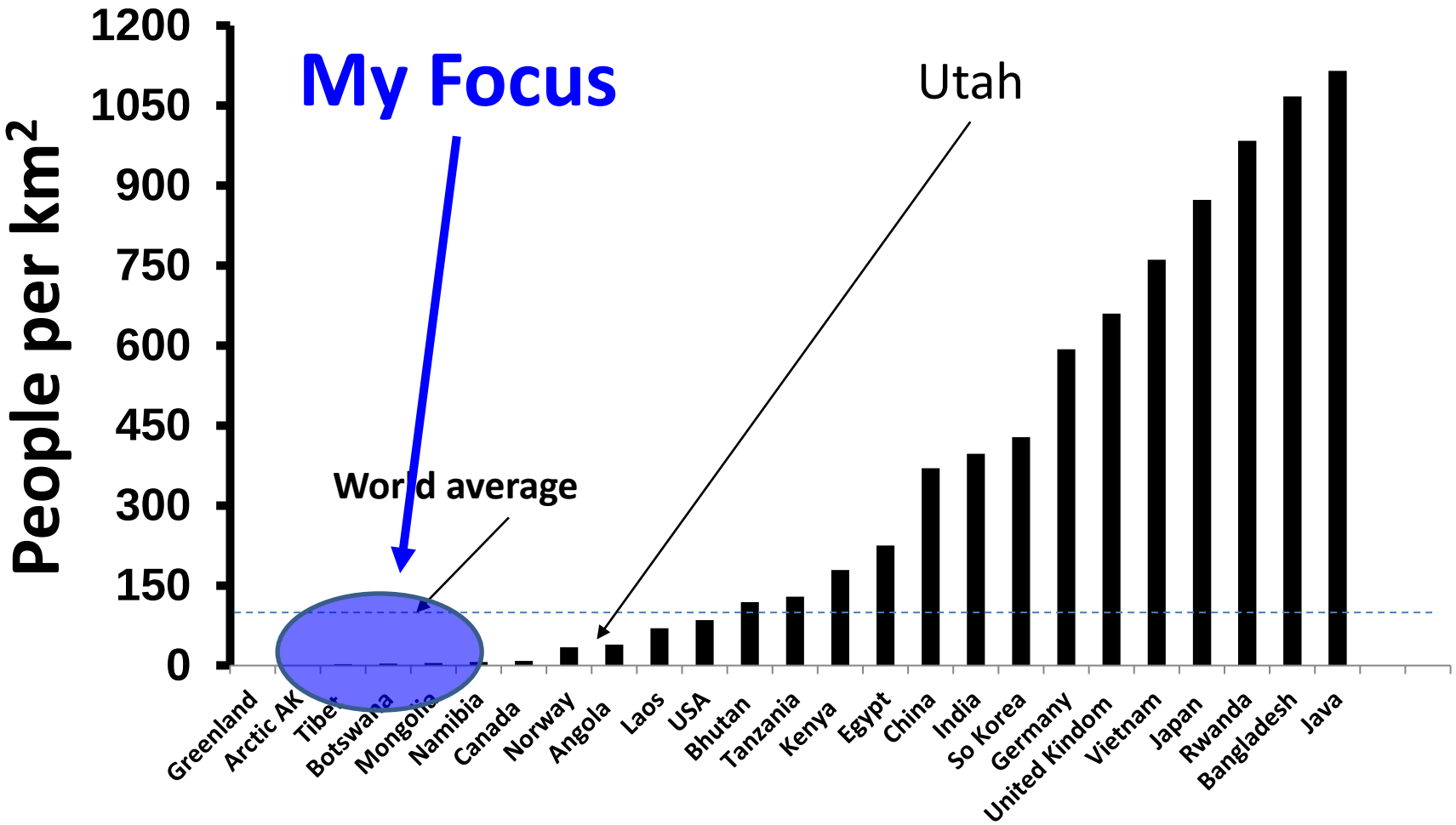
Human Densities



International Organization for Standardization 2015

lorado State

World's Population Density



Gaza Strip = 5050
Singapore = 7300

International Organization for Standardization: 2020

Global Challenges

FAO – *a while ago*

Climate

Human Footprint

Colorado State University

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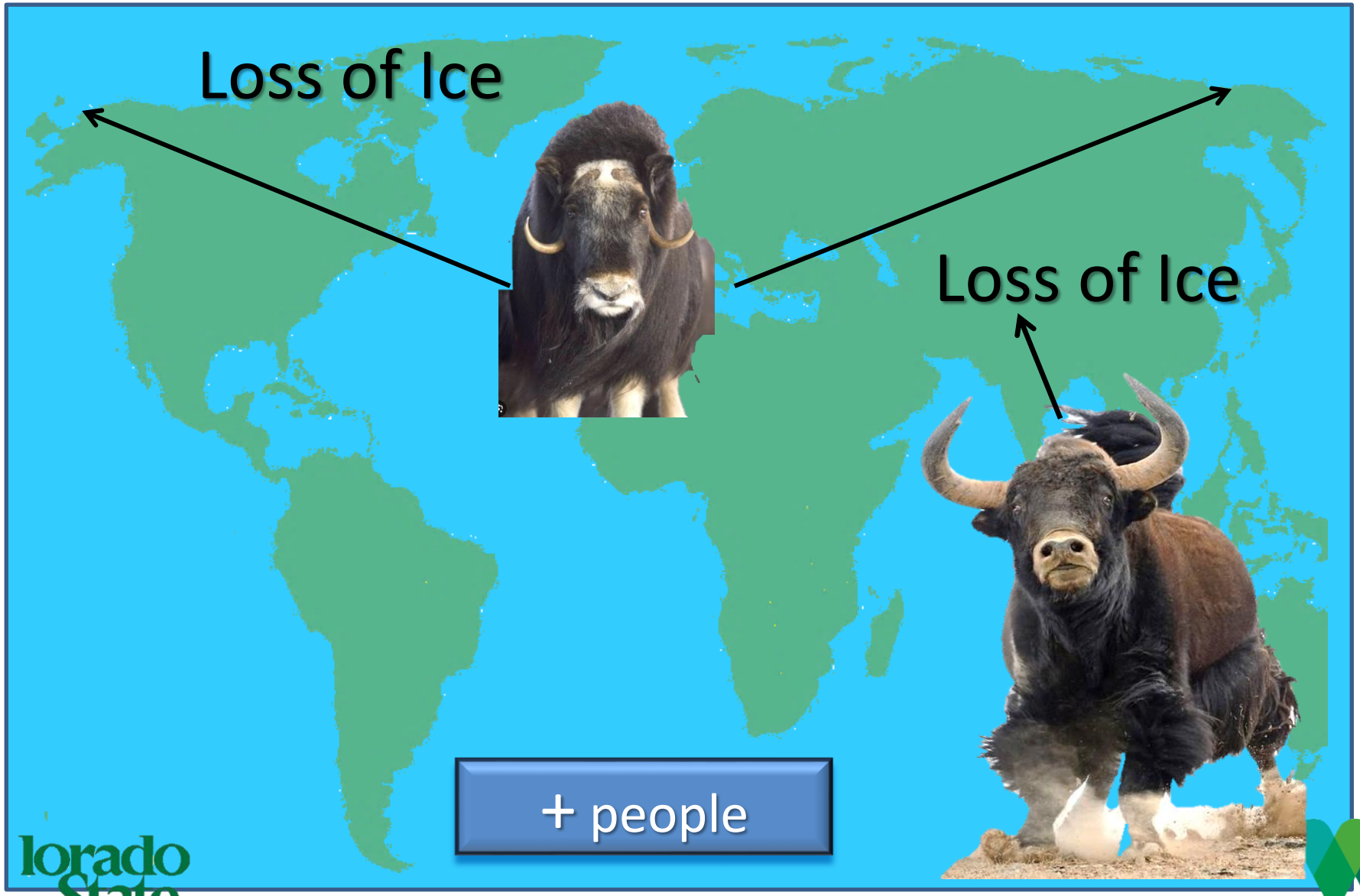
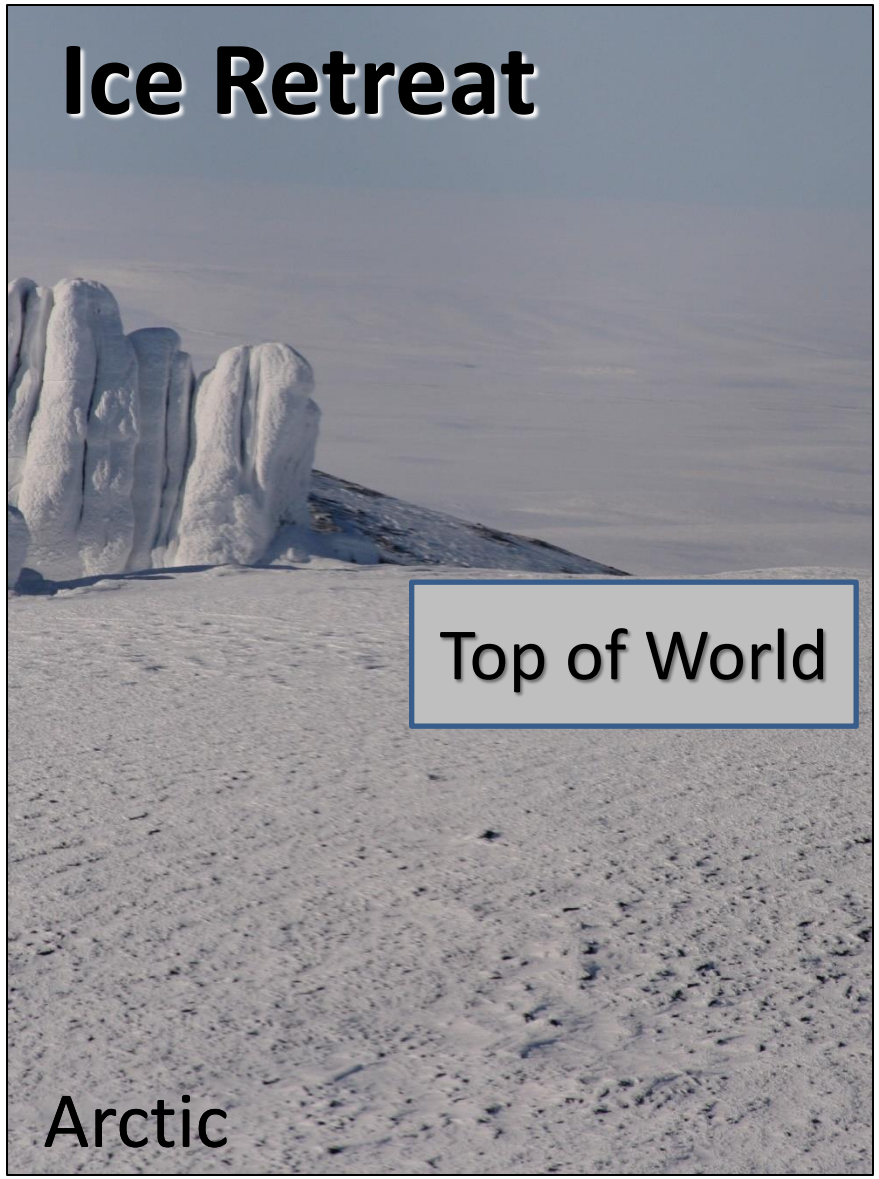
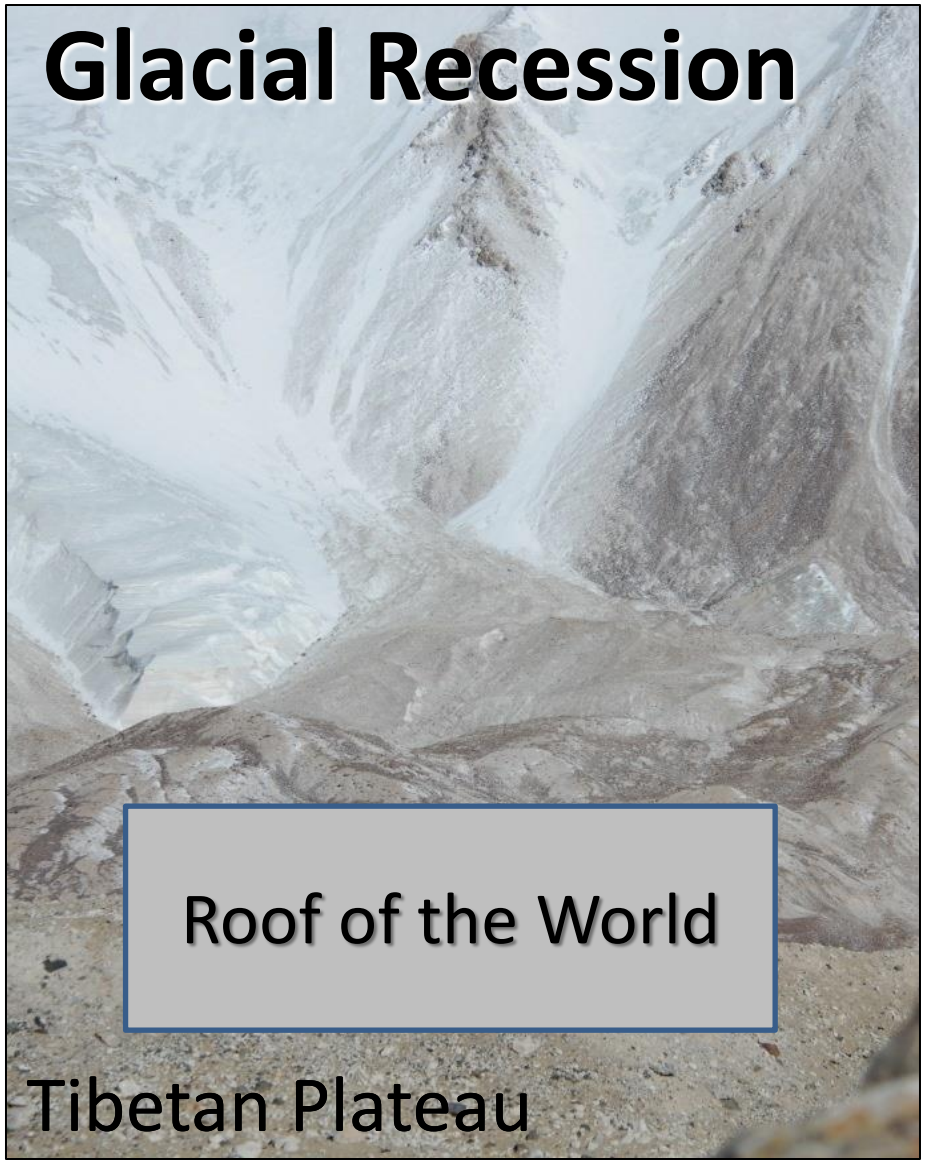
Very Cold-Adapted Species

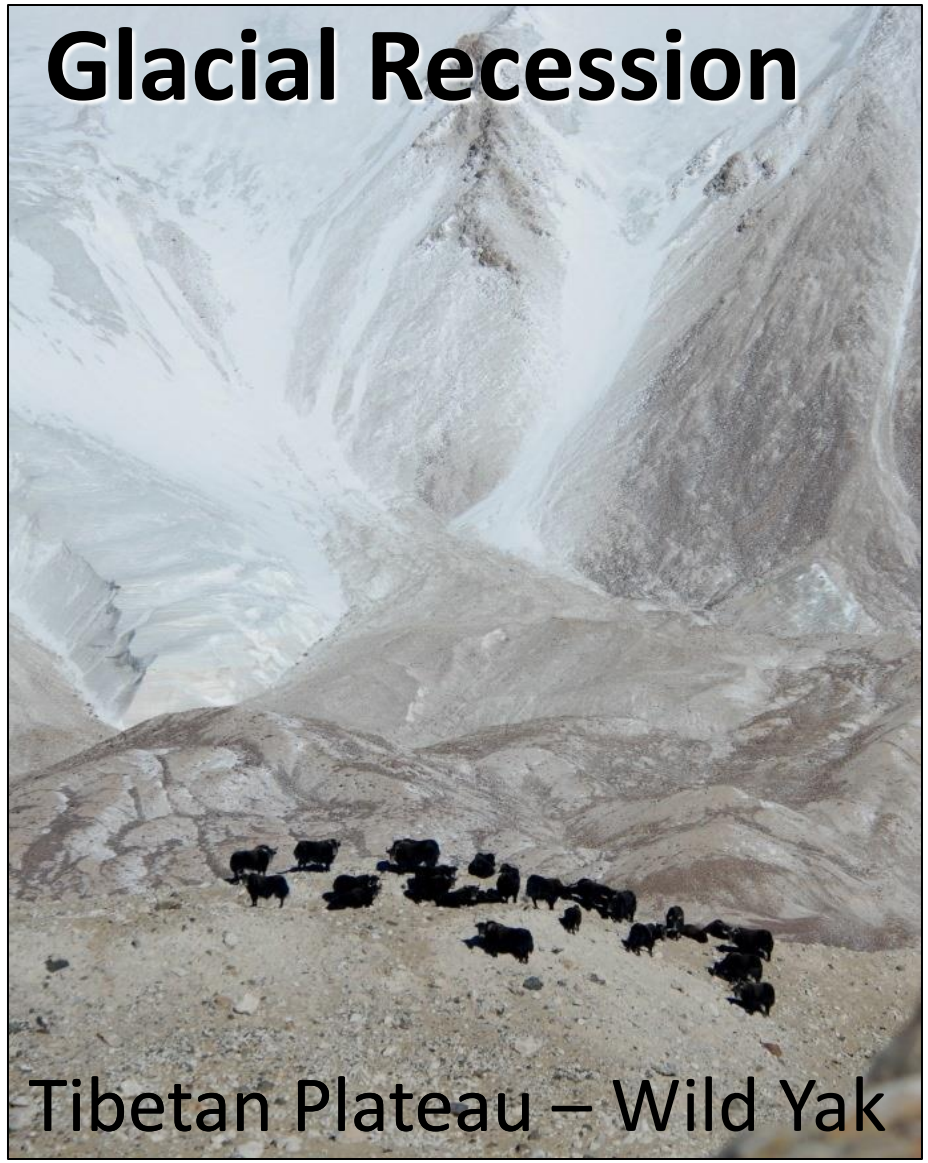


Systems are Changing

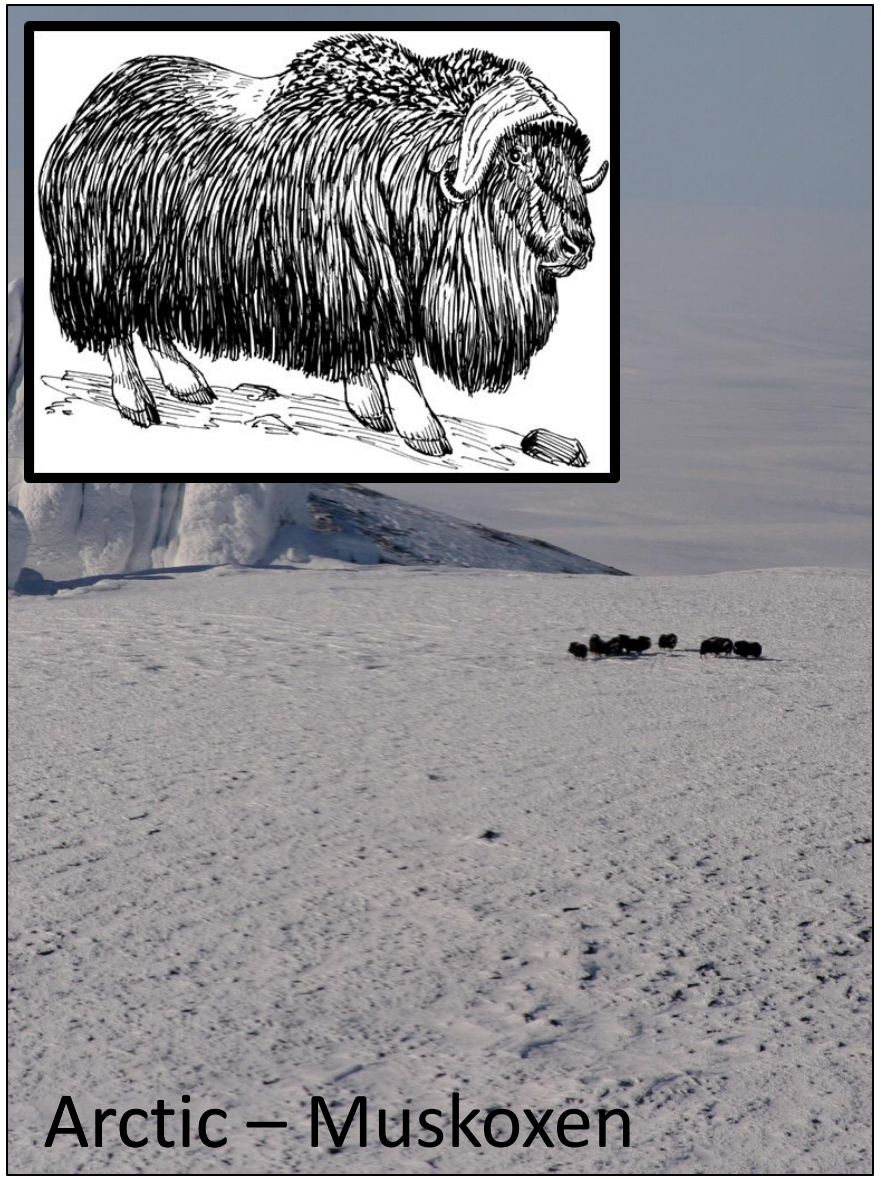


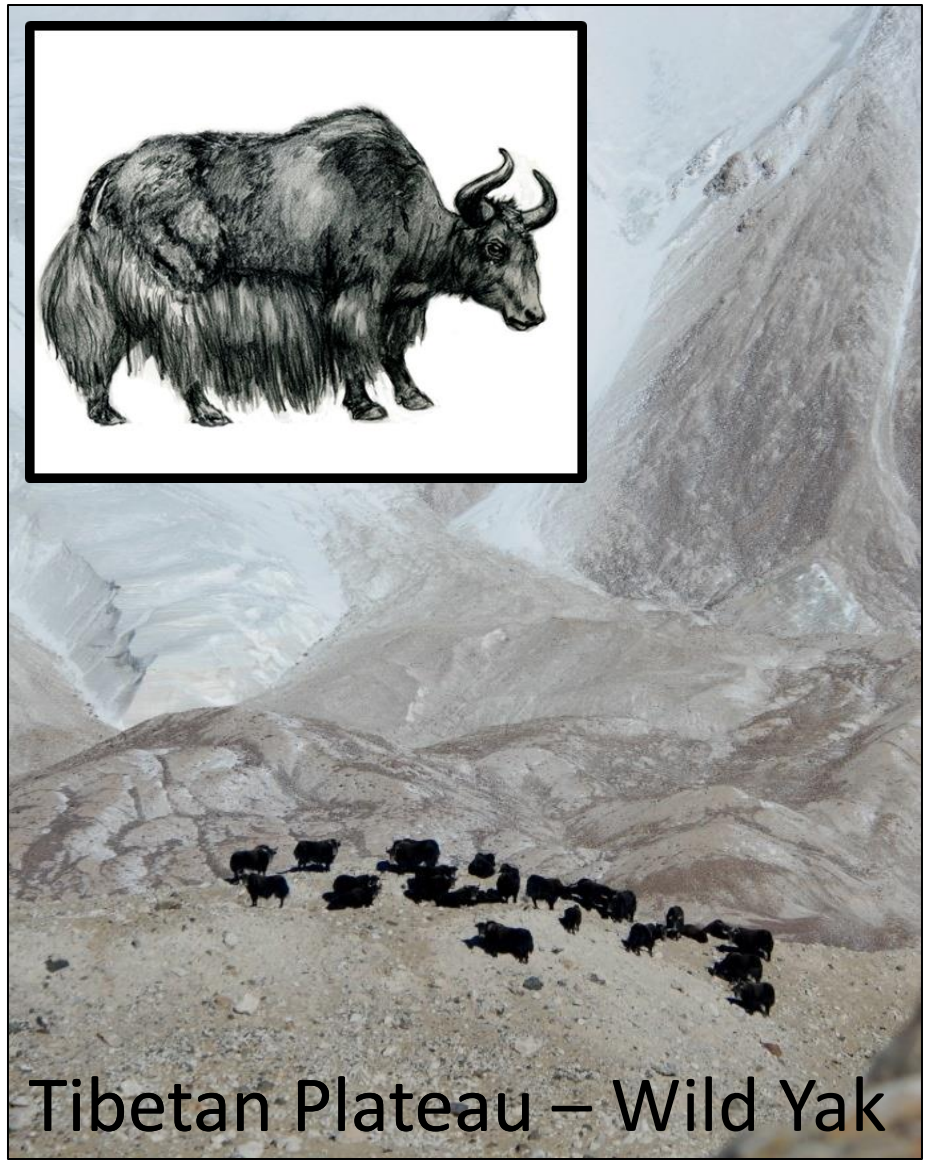


Systems are Changing



Convergent Adaptations



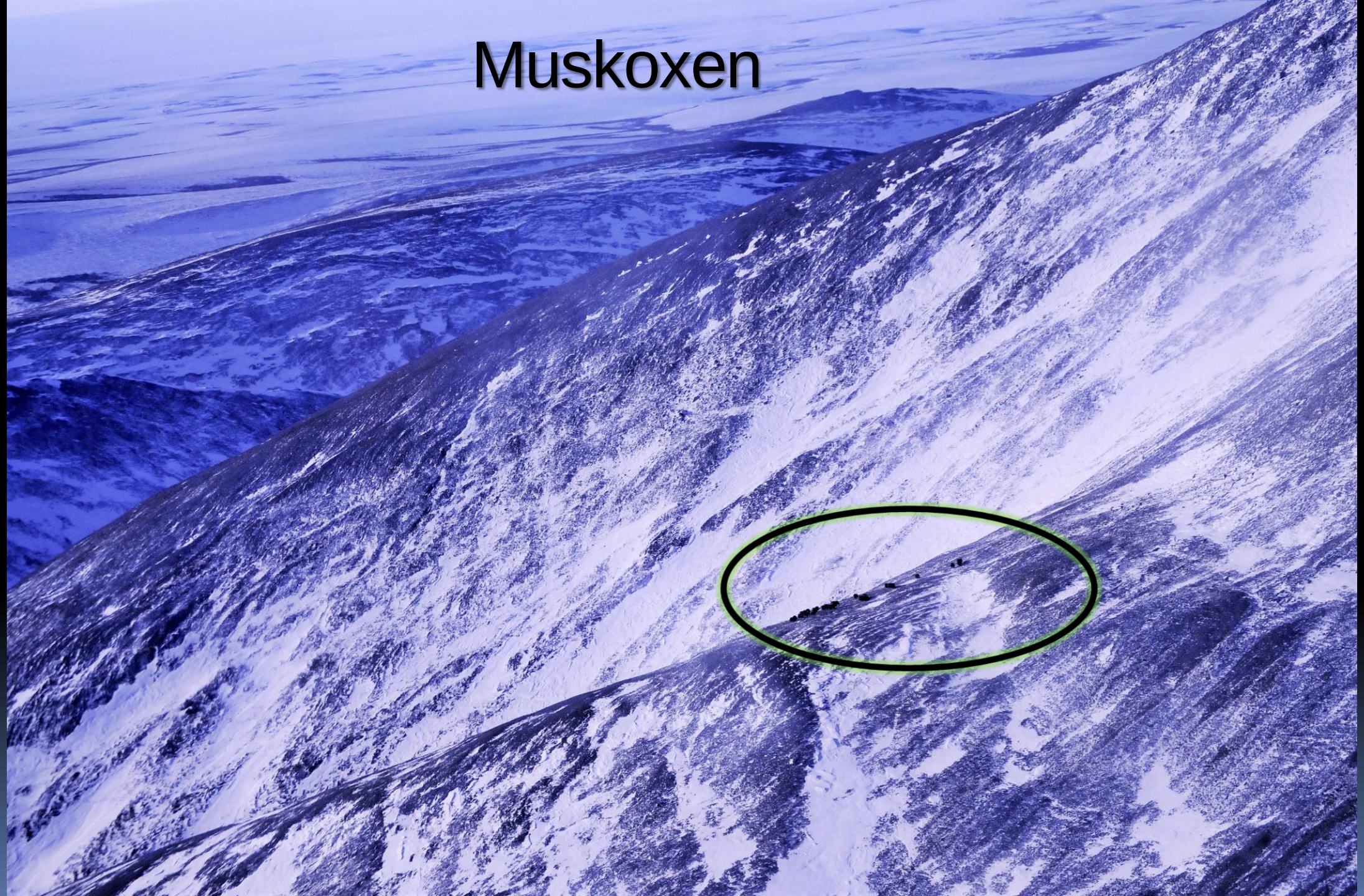


Top of the world – Reasonably Extreme

Beringia

Muskoxen

Muskoxen

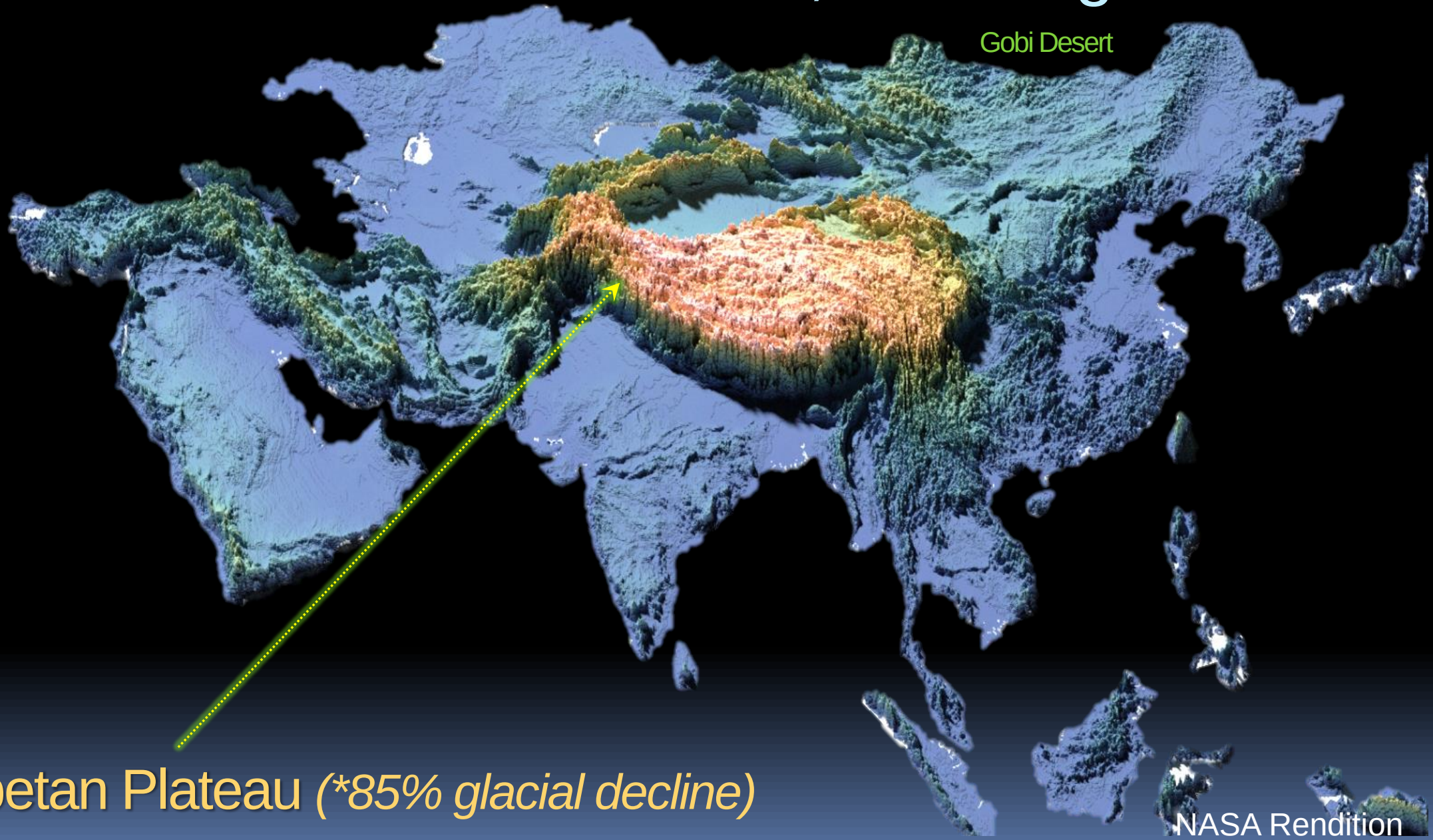


Making a Living

People also Make a Living

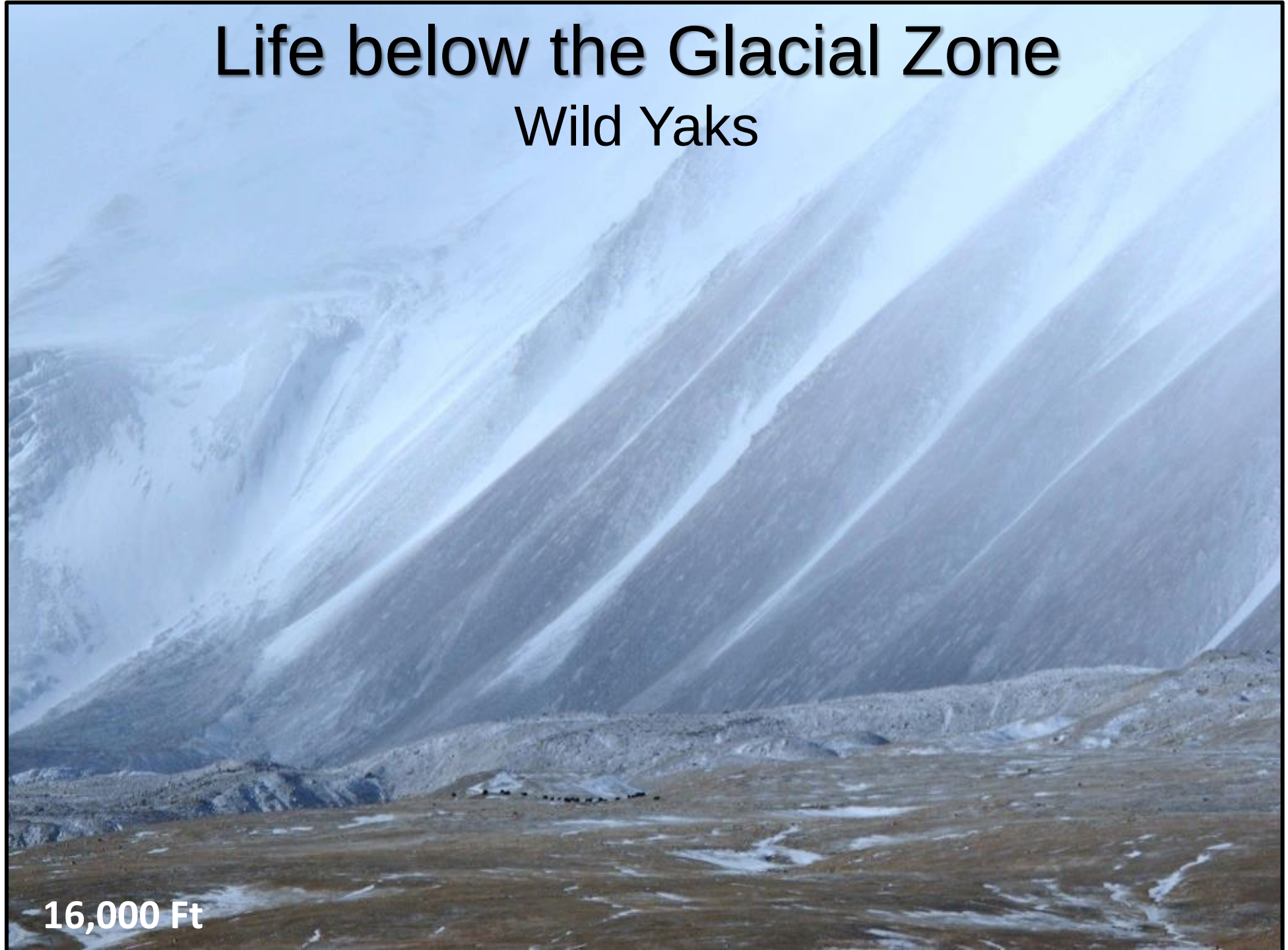
Subsistence is Tricky

Roof of the World, Warming*



Life below the Glacial Zone

Wild Yaks



Life at Glacial Interface

Life at Glacial Interface

Kiang

Yaks are Bison Equivalents

~15,800 feet

People's Lives - Roof of the World

© *WCS* -J. Berger

Harsh Life with Domestic Yaks

Marginalization

Yaks = Subsistence

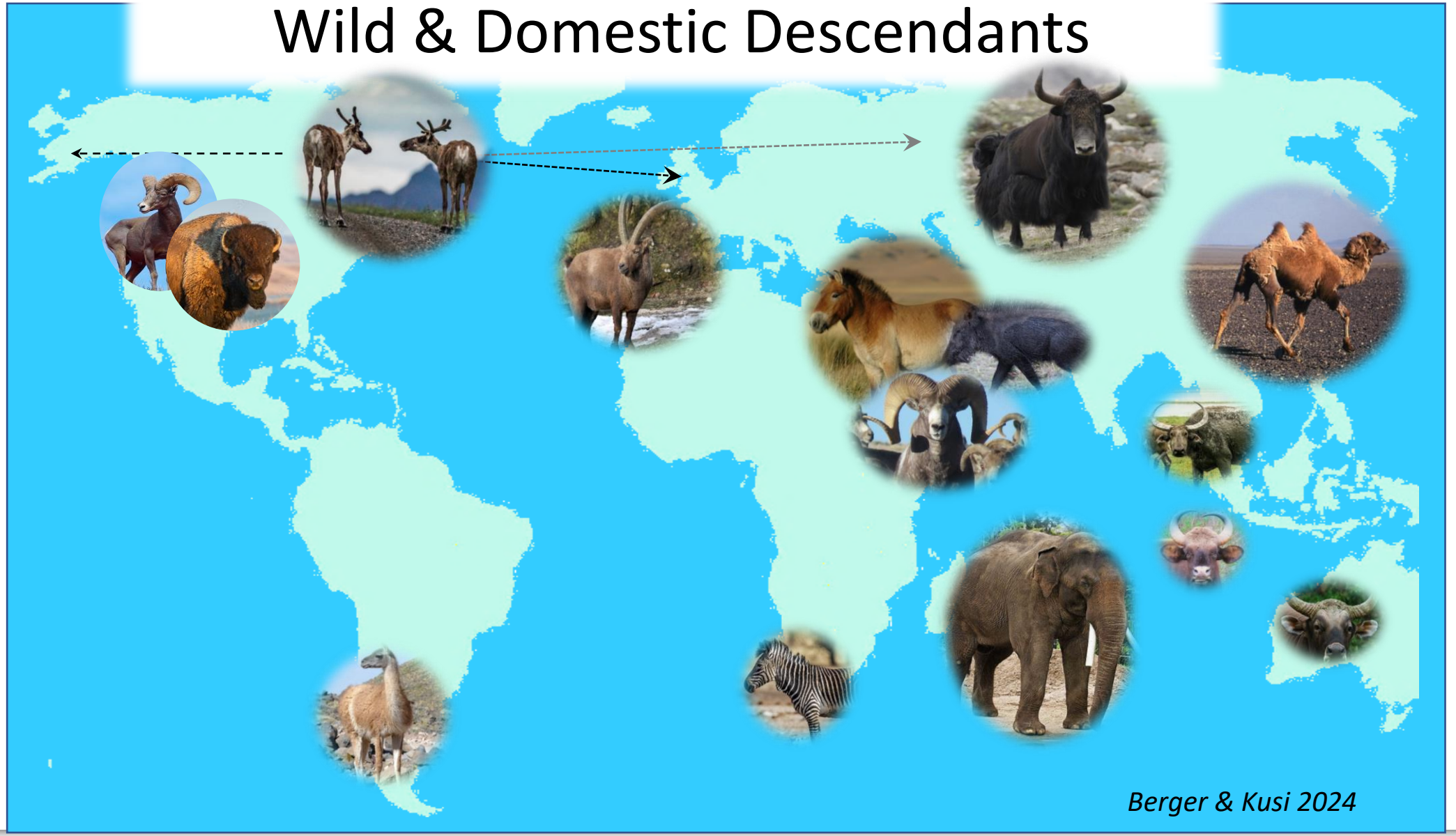
Fatal Attractions – Conflict

Wild & Domestic Descendants

No winners

Berger & Kusi 2024

Wild & Domestic Descendants

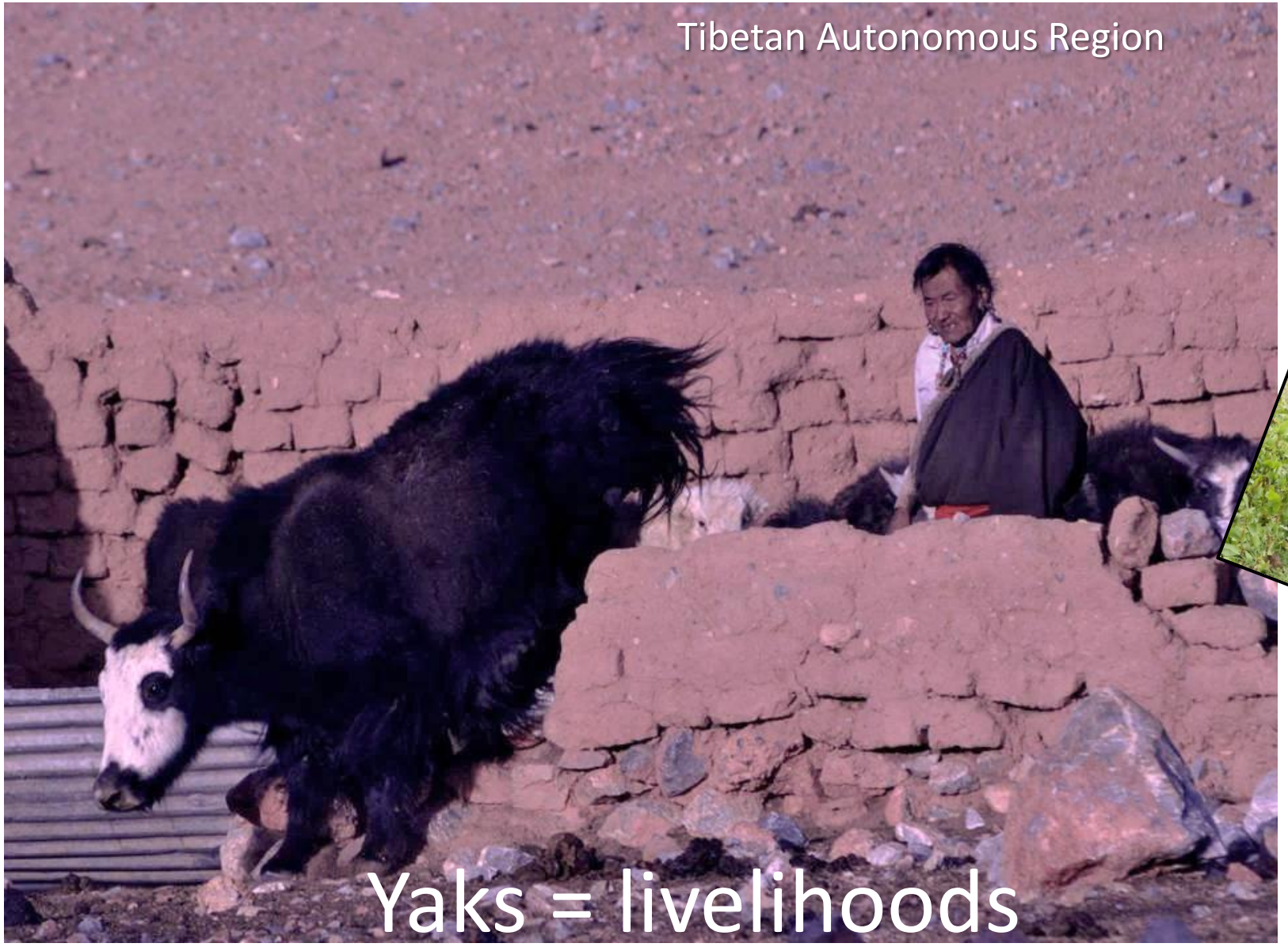


Berger & Kusi 2024

Injury & Death, $$$ & Hybrids

Berger & Kusi 2024

Marginalization



Many Issues –

Economic - losses of valued stock

Wild ♂ take ♀

Biological - hybridization

Sticks and stones ≠ defense

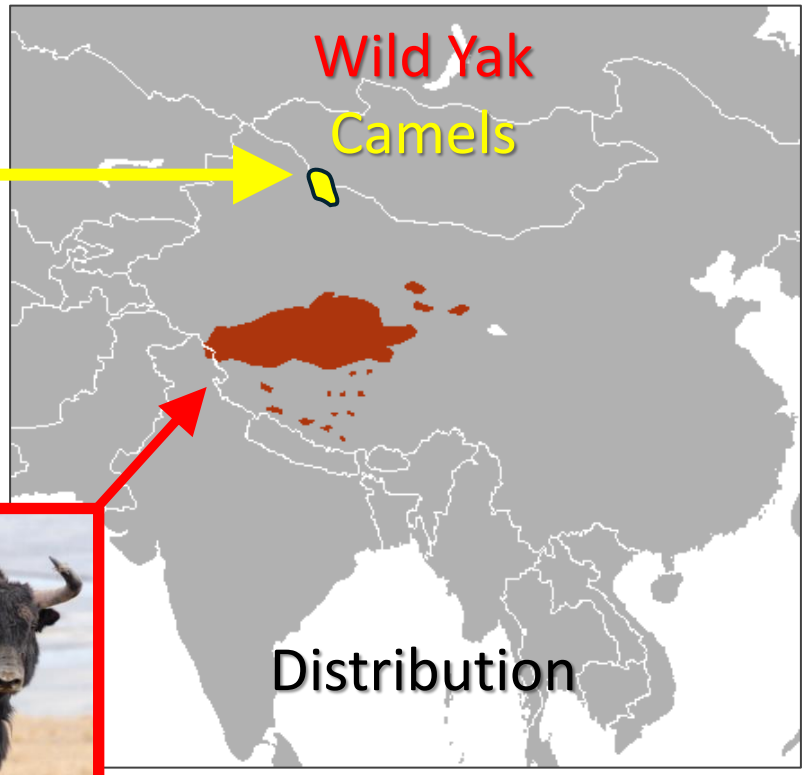
Injuries & Deaths

Images: T. Bate

1 – obscured due to pastoralist request

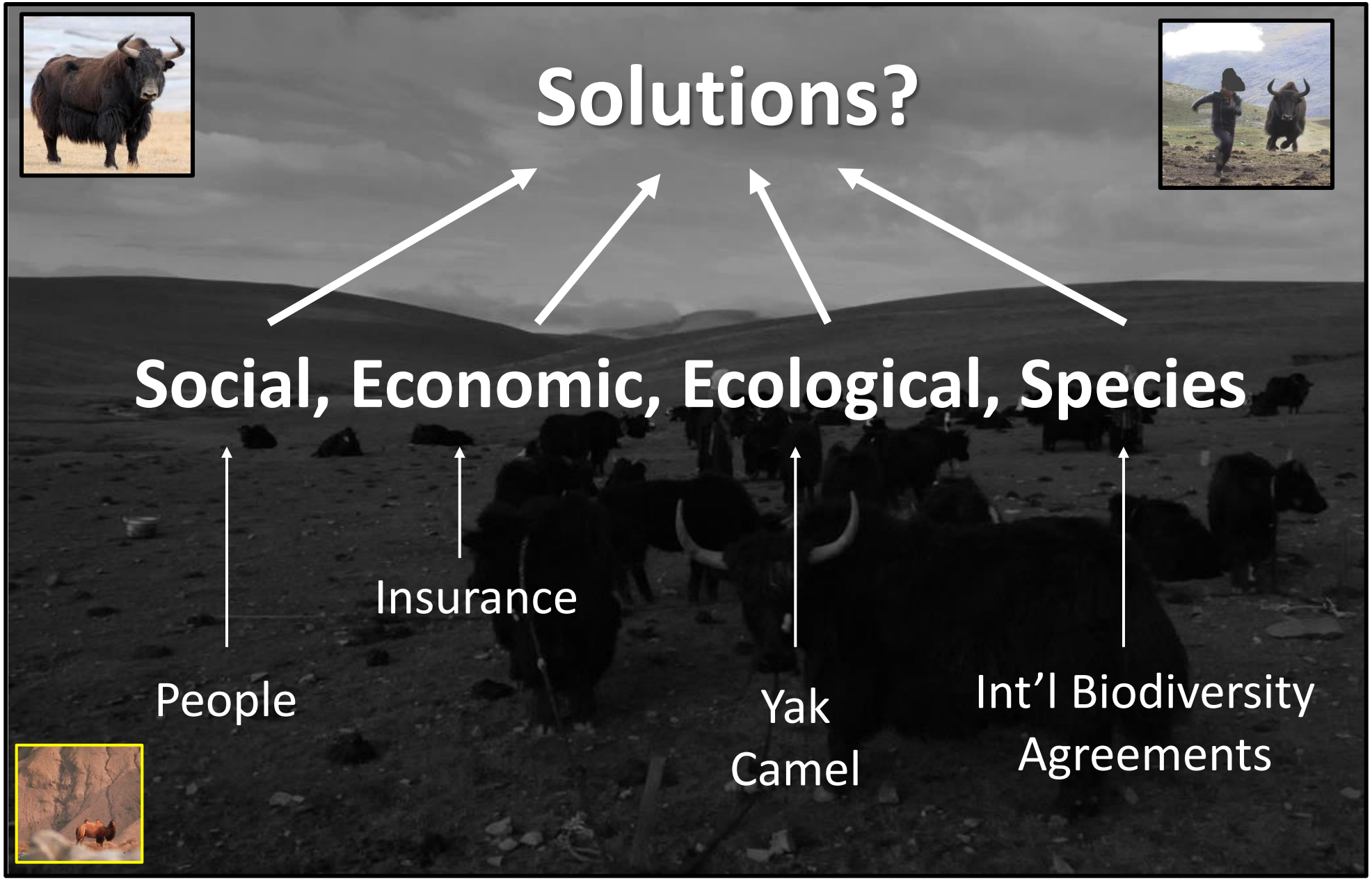
HWC – at Earth's Margins

IUCN



Solutions?

Difficult Decisions



Human Footprint

FAO – *a while ago*

Colorado State University

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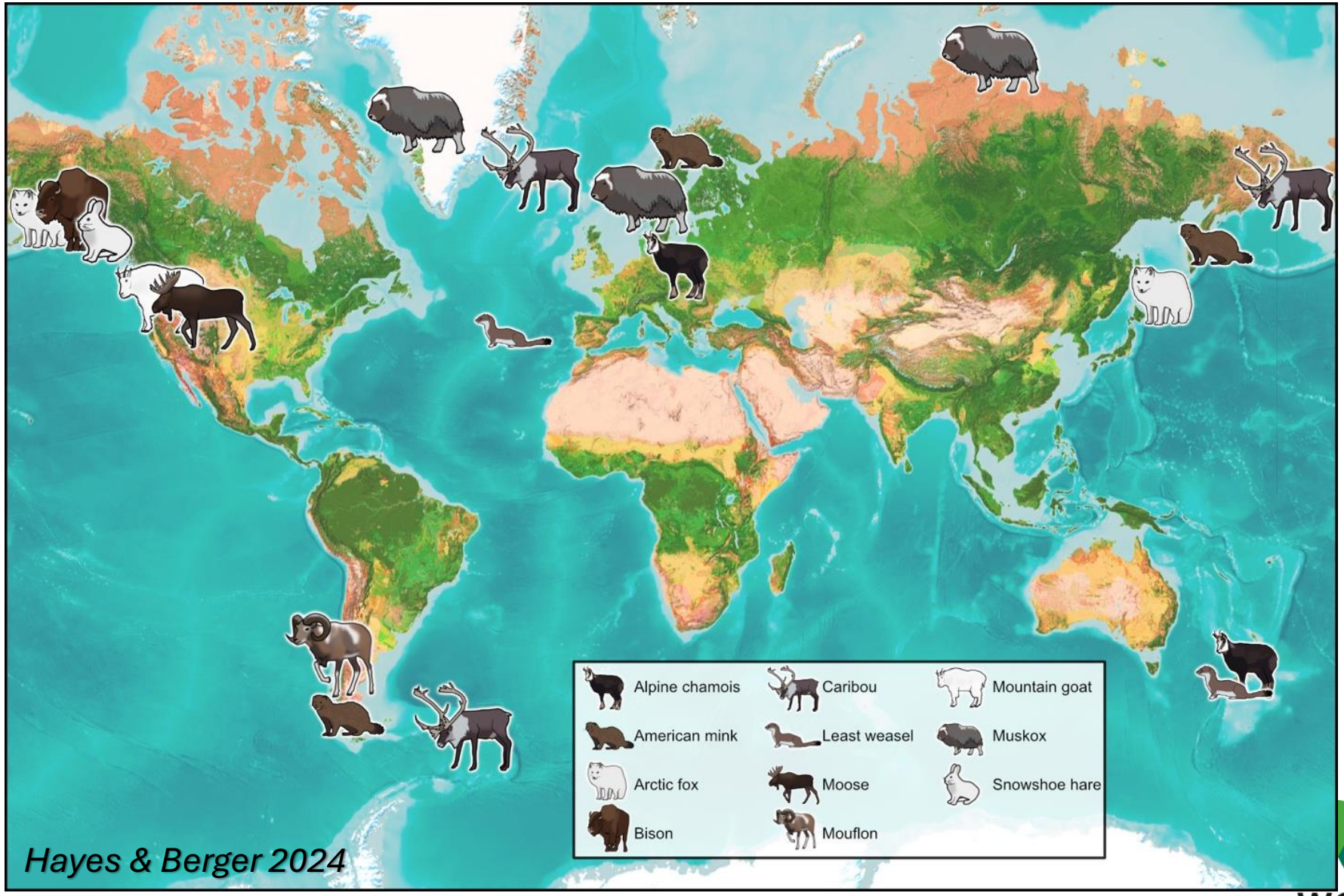
Humans: Moving Wild Animals for Us

Species to places where they did not exist



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Humans: Moving Wild Animals for Us

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Humans: Moving Wild Animals for Us

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Inadvertent Climate Refugia

Alaska & Russia

Utah

Utah

Muskoxen

- Extinct 25 yrs after 1867 Alaskan purchase from Russia

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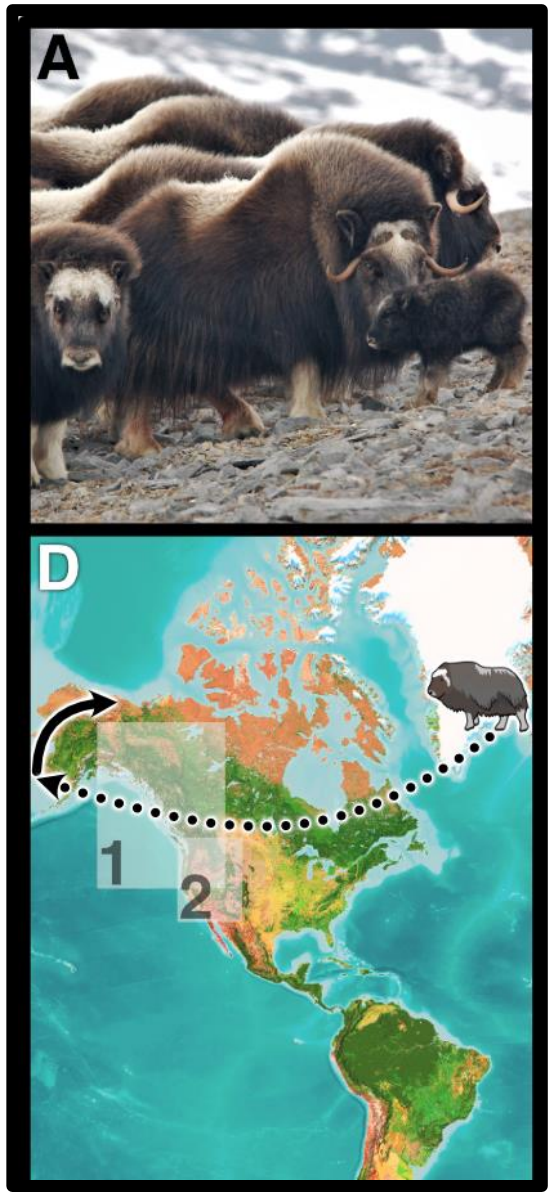

Muskoxen

- Extinct 25 yrs after 1867 Alaskan purchase from Russia
- (1930s) by boat, train, boat, train, boat to Nunivak Island refuge
- Re-introduced AK and Chukotka (RU)

SUCCESS

WCS

Bison

- Suitable cold elevation in Henry Mts
- Transplanted from Yellowstone 1941

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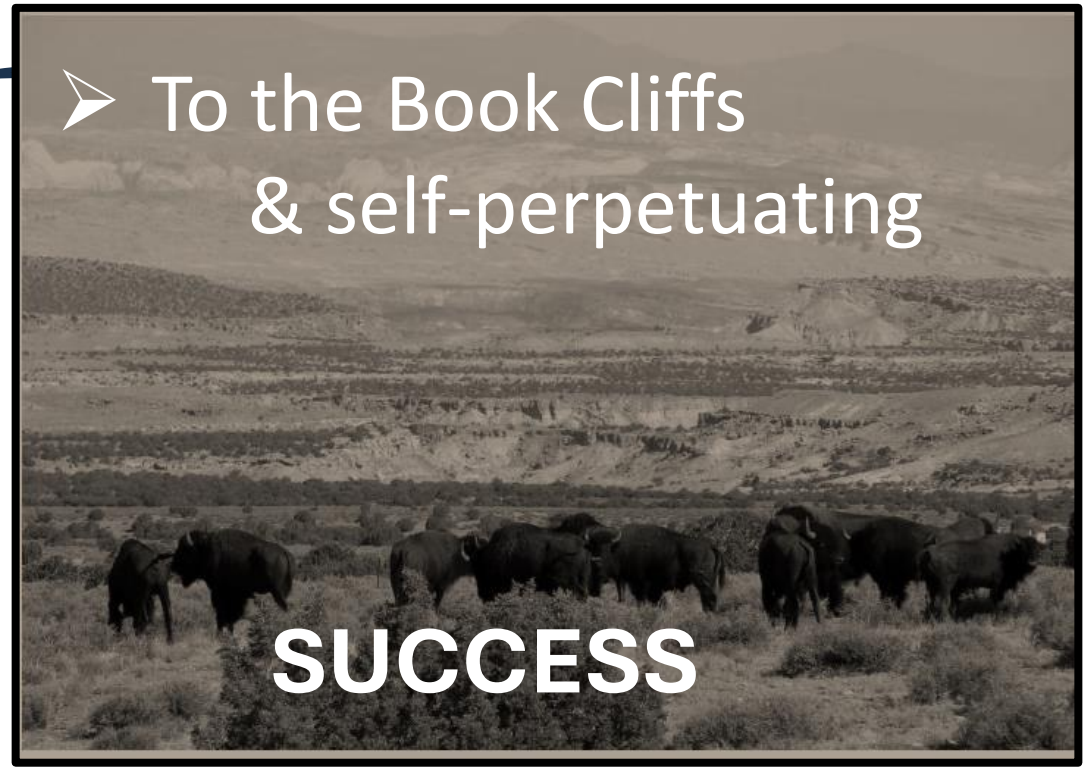
Bison

- Suitable cold elevation in Henry Mts
- Transplanted from Yellowstone 1941



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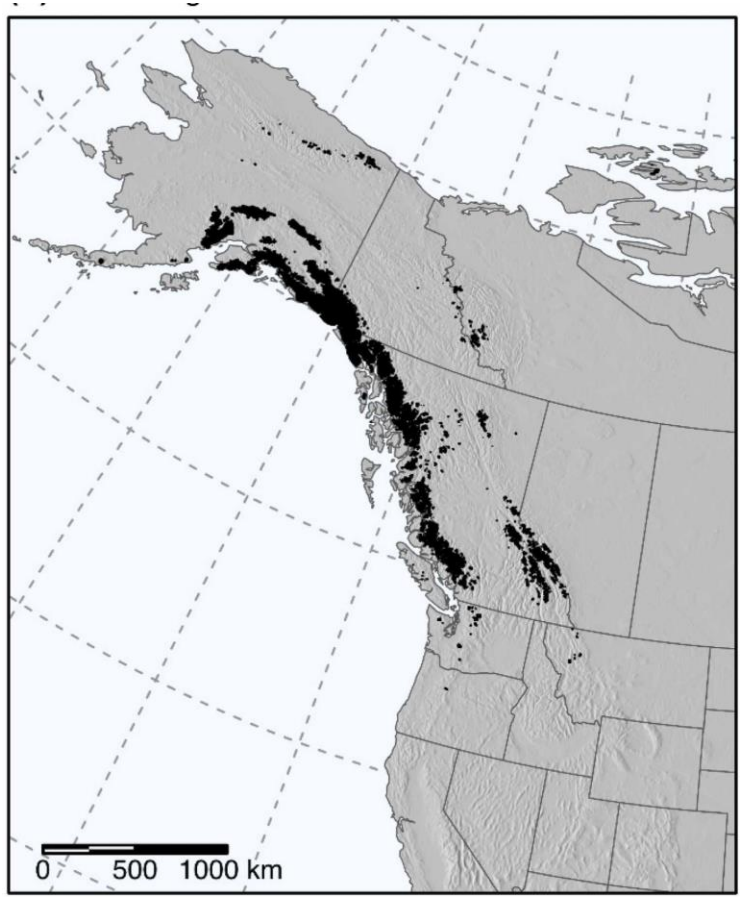
Mountain Goats

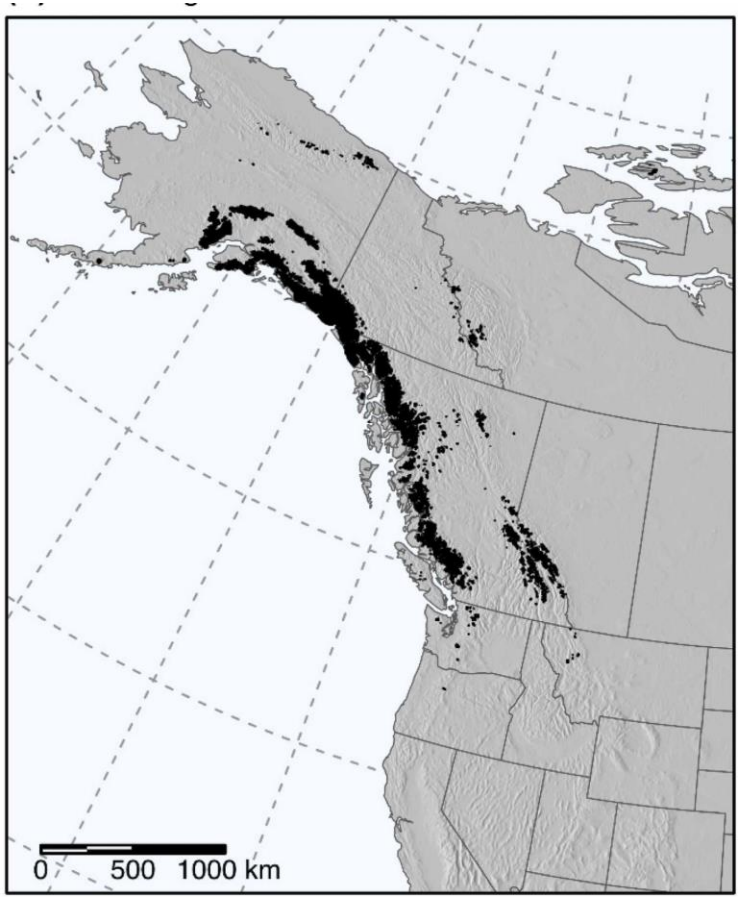
A different Story



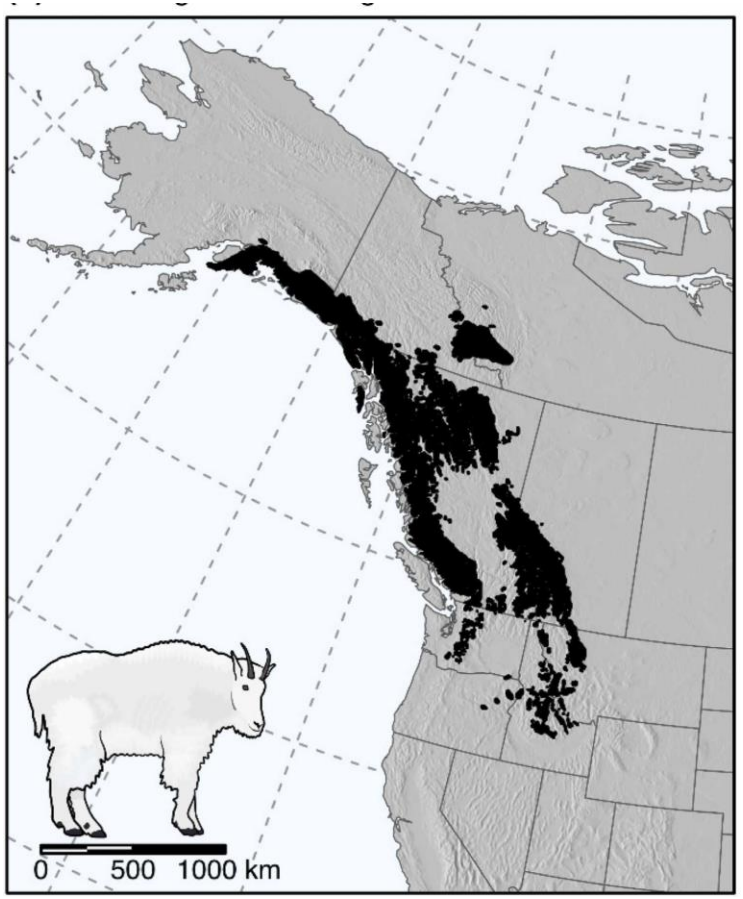
Persistent Ice & Glaciers

Mountain Goats

A different Story



Persistent Ice & Glaciers



Native Range

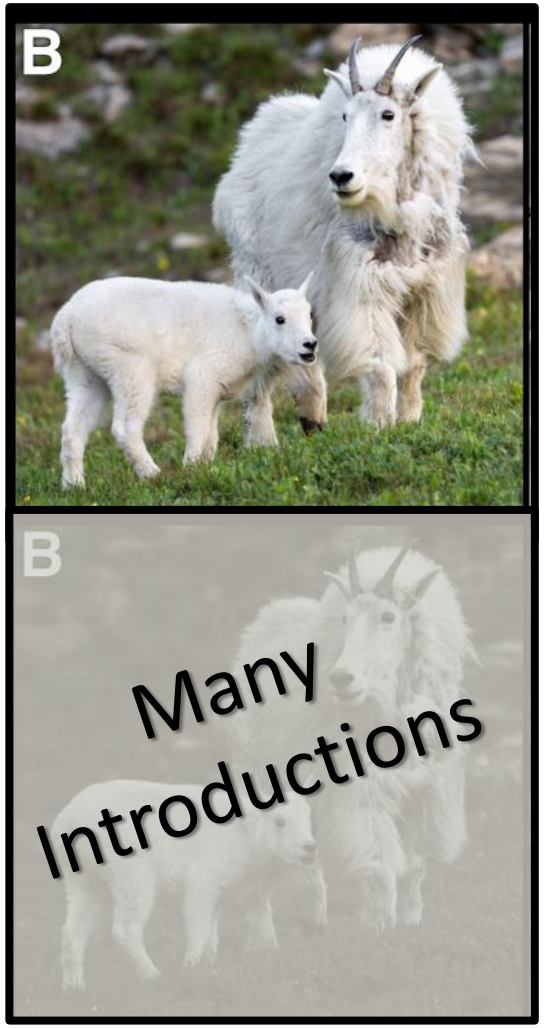
Mountain Goats

A different Story

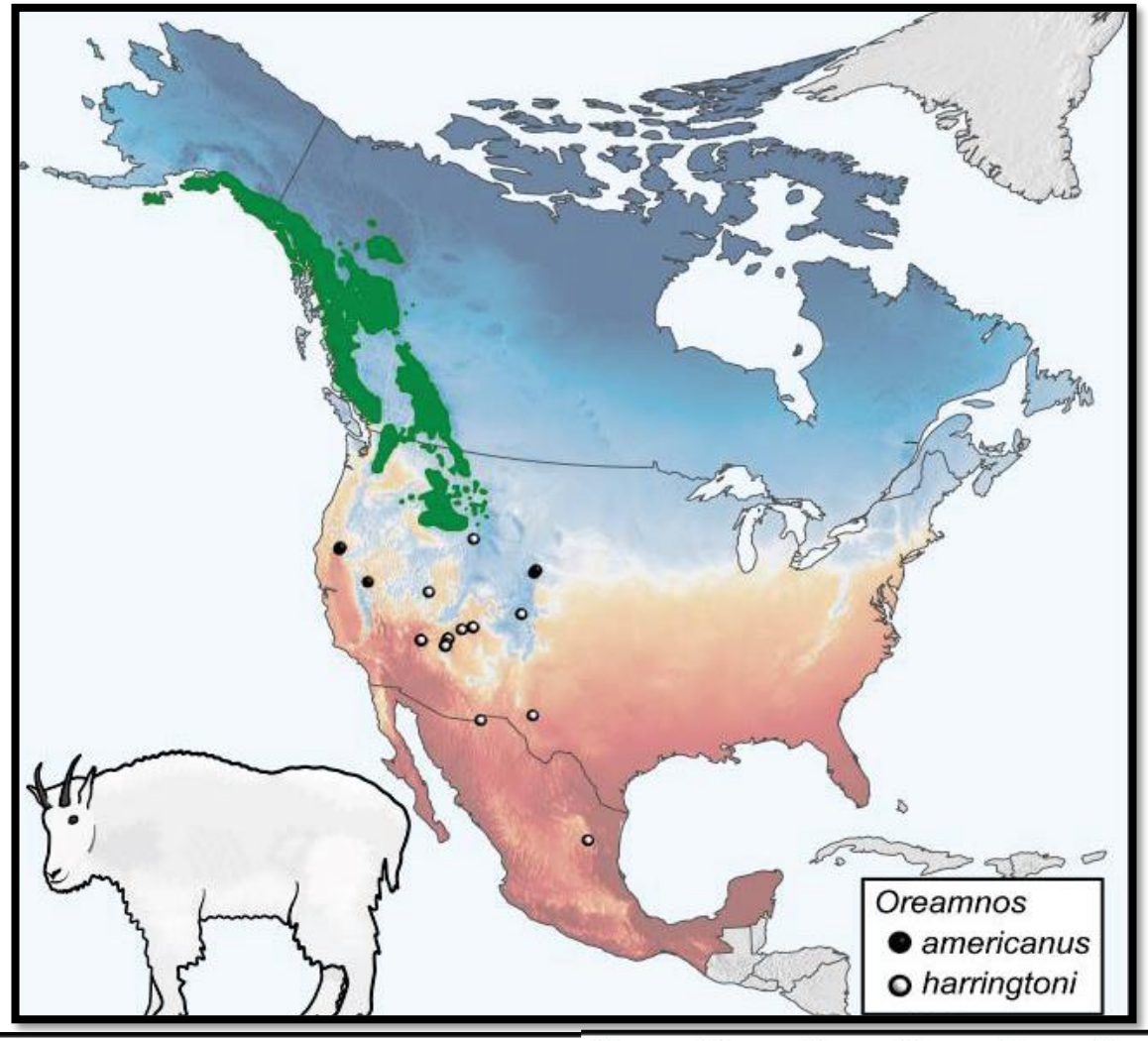
Southern populations hanging on
(e. g. lag effect)

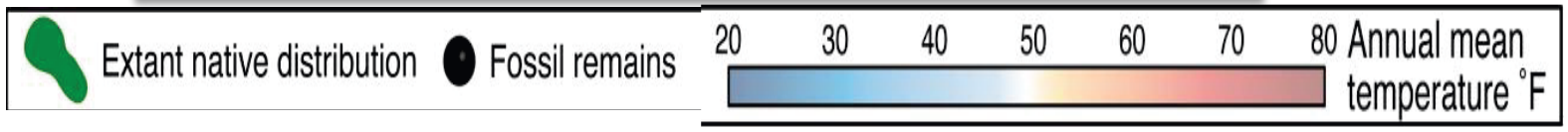
Persistent Ice & Glaciers

Native Range

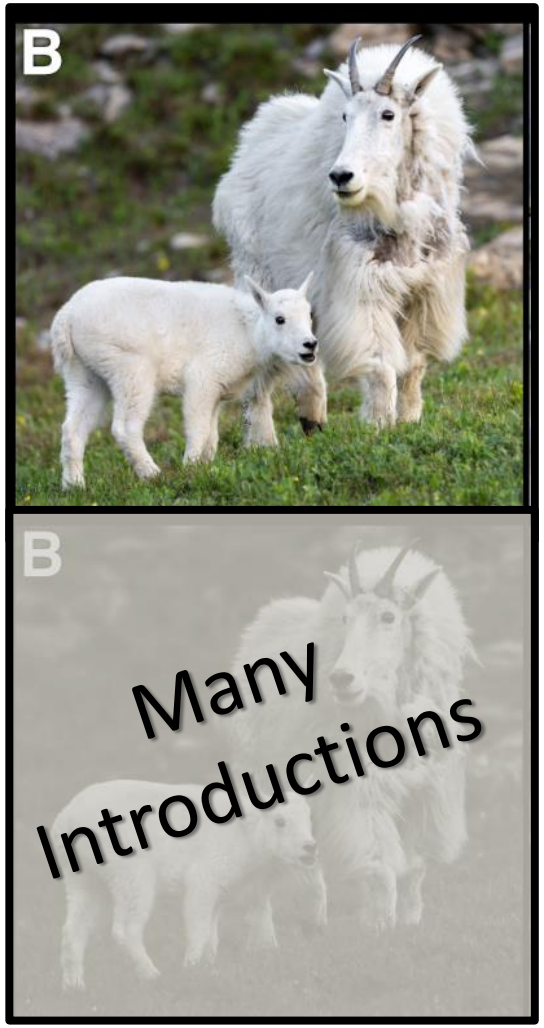


Toasted by climate warming





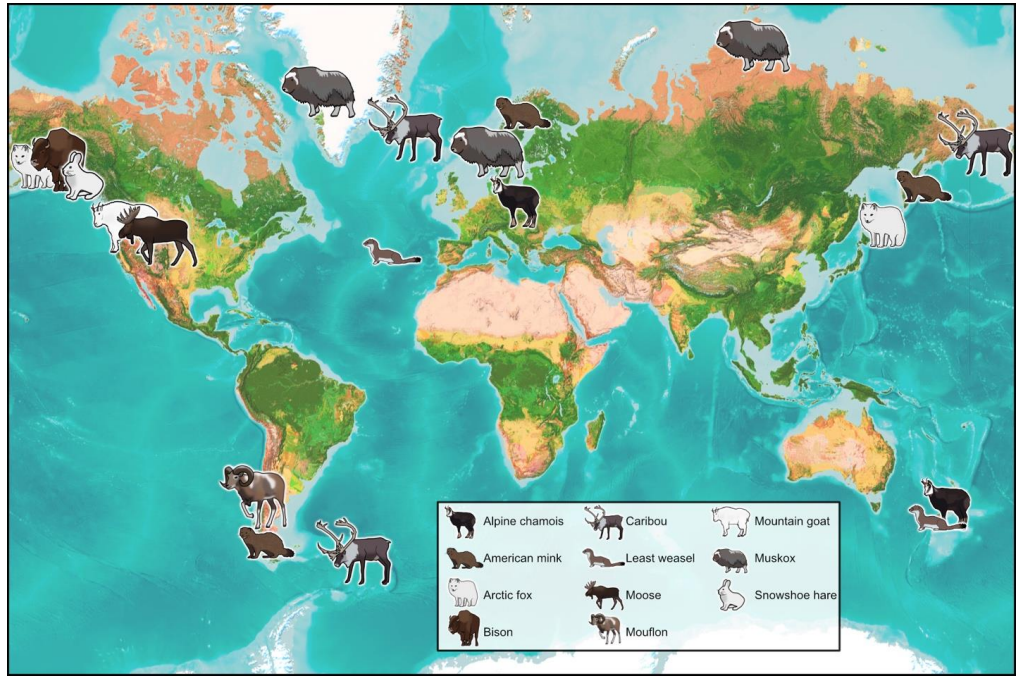
Introductions not conserving biodiversity



Photos: Marc Coles-Ritchie

Yes – We Move Species for US

- Most are for Human Enjoyment
- Sometimes Inadvertent Climate Refugia Play a Conservation Role



Alaska & Russia Utah Utah

Migration & Conservation

With Human Livelihoods

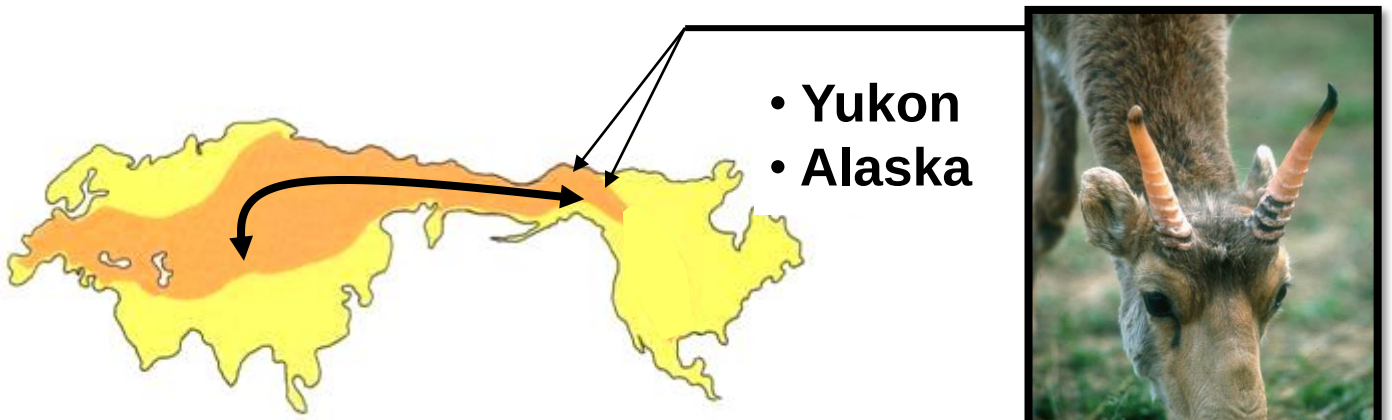
1 - courtesy Brendan Wenzel

Saiga – Backdrop & Failure

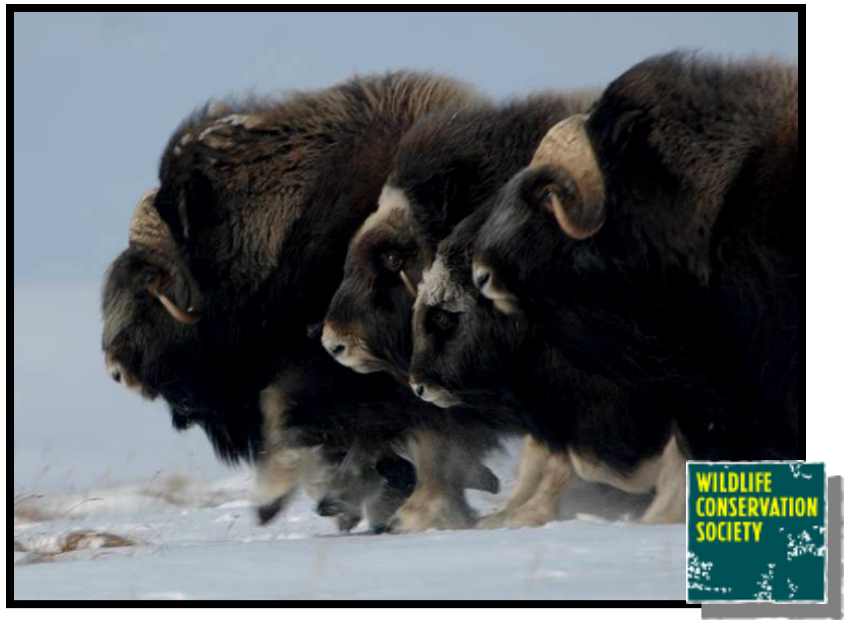
World's Most Northern Antelope

B. Wenzel

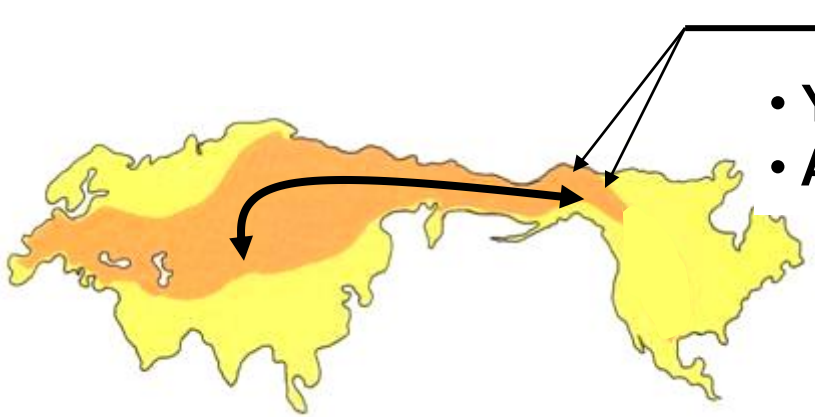
Pleistocene Distribution



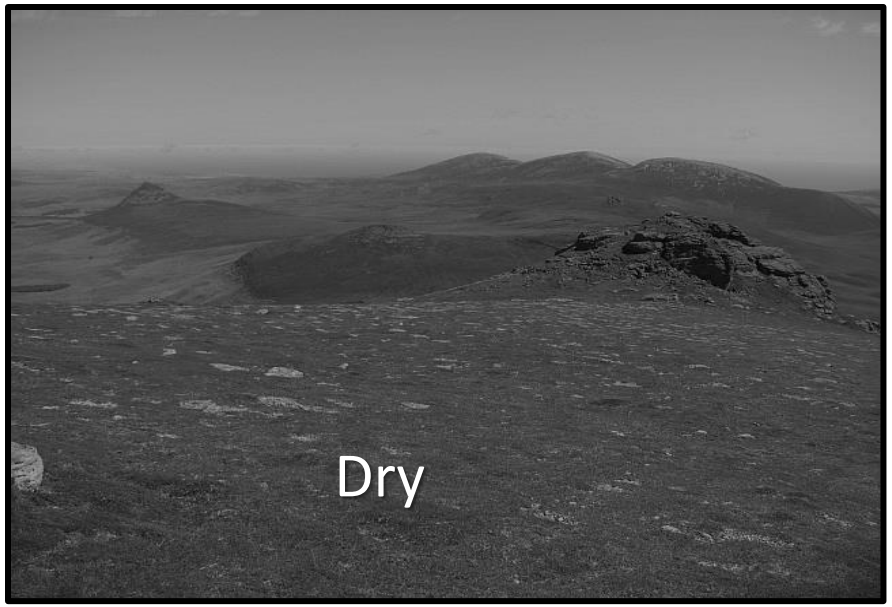
- Yukon
- Alaska



Vegetation



- Yukon
- Alaska



WILDLIFE CONSERVATION SOCIETY

Vegetation Changed

How Science Can Help

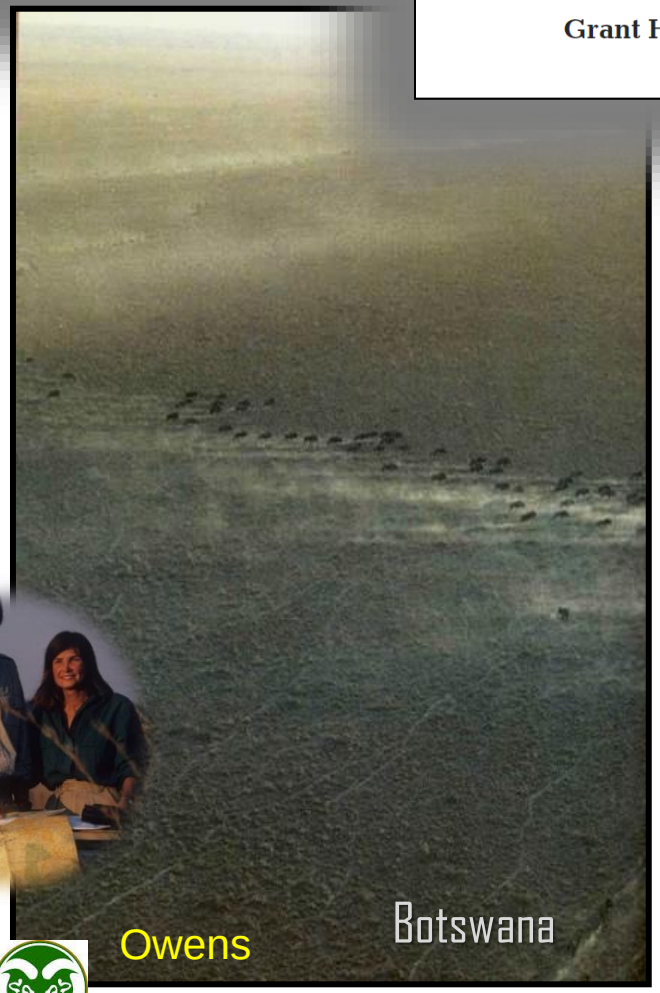
Gobi Desert – Mongolia

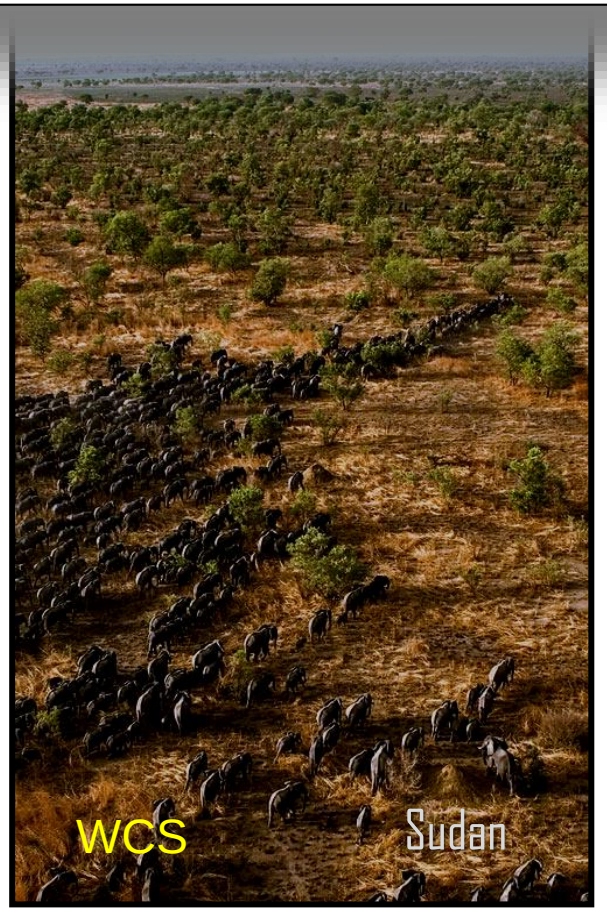
Migrations & Pops Collapse Globally

ENDANGERED SPECIES RESEARCH
Endang Species Res

Global decline in aggregated migrations of large terrestrial mammals

Grant Harris[1,2,*], Simon Thirgood [3,4], J. Grant C. Hopcraft[3,5], Joris P. G. M. Cromsigt[6], Joel Berger[7,8]





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Much Uncertainty in 2004

"With only 800 Mongolian saiga left, extinction is an immediate threat;

"It is necessary to prepare a captive breeding and reintroduction program"

Int'l Workshop Results
Kazakhstan *(Almaty; 2004)*

Much Uncertainty in 2004

- Breeding centers expensive

Much Uncertainty in 2004

- Breeding centers expensive
- Captures costly and risks
- Numbers count


With Much Government Consternation

Local Program to Est Pop Size

WCS

Collaborators

Narastratsal

Buuveibaatar

МОНГОЛ УЛСЫН ШИНЖЛЭХ УХААНЫ АКАДЕМИ
THE MONGOLIAN ACADEMY OF SCIENCES

Rich Reading

Charu Mishra

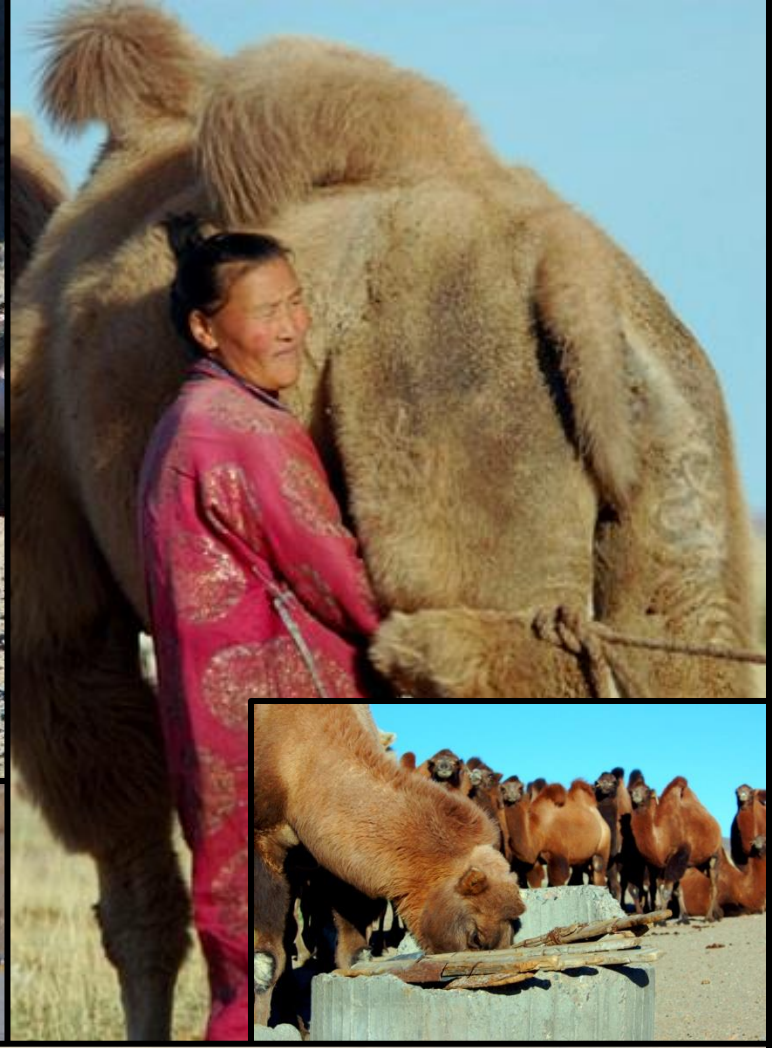
Ganchimeg Jamiyansuren

Snow Leopard Trust

lorado State

Traditional

Central Asia



Surveys to Approximate Population Size

& Radio-Collars to Track Movements

Aerial Support Prohibited

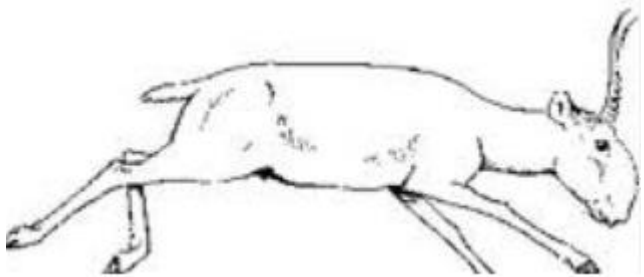
Surveys to Approximate Population Size

& Radio-Collars to Track Movements

Camels will not work

To Net a Saiga

The Idea



Reality

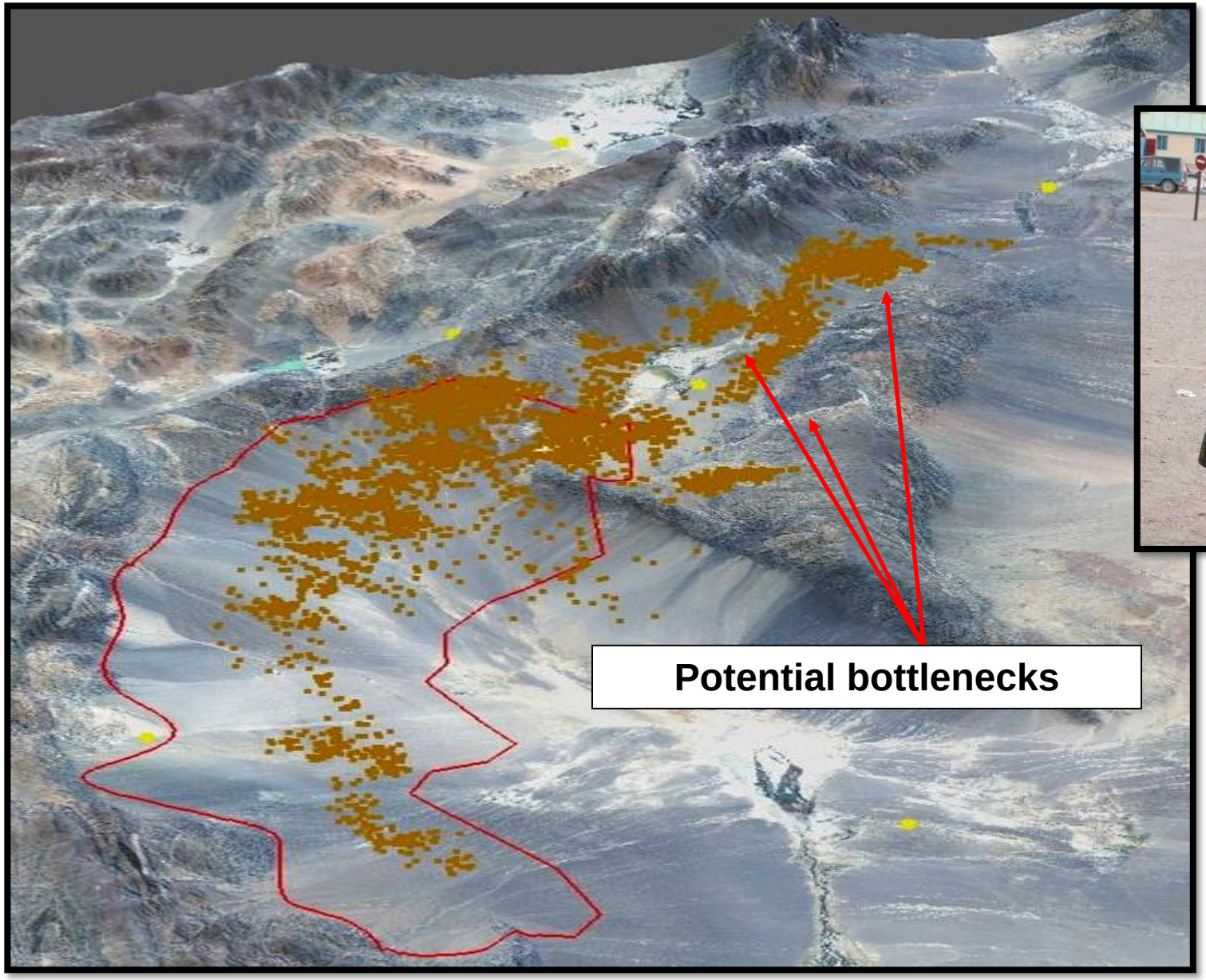
Success

all survive

Animals Released – data stream in (*sort of)

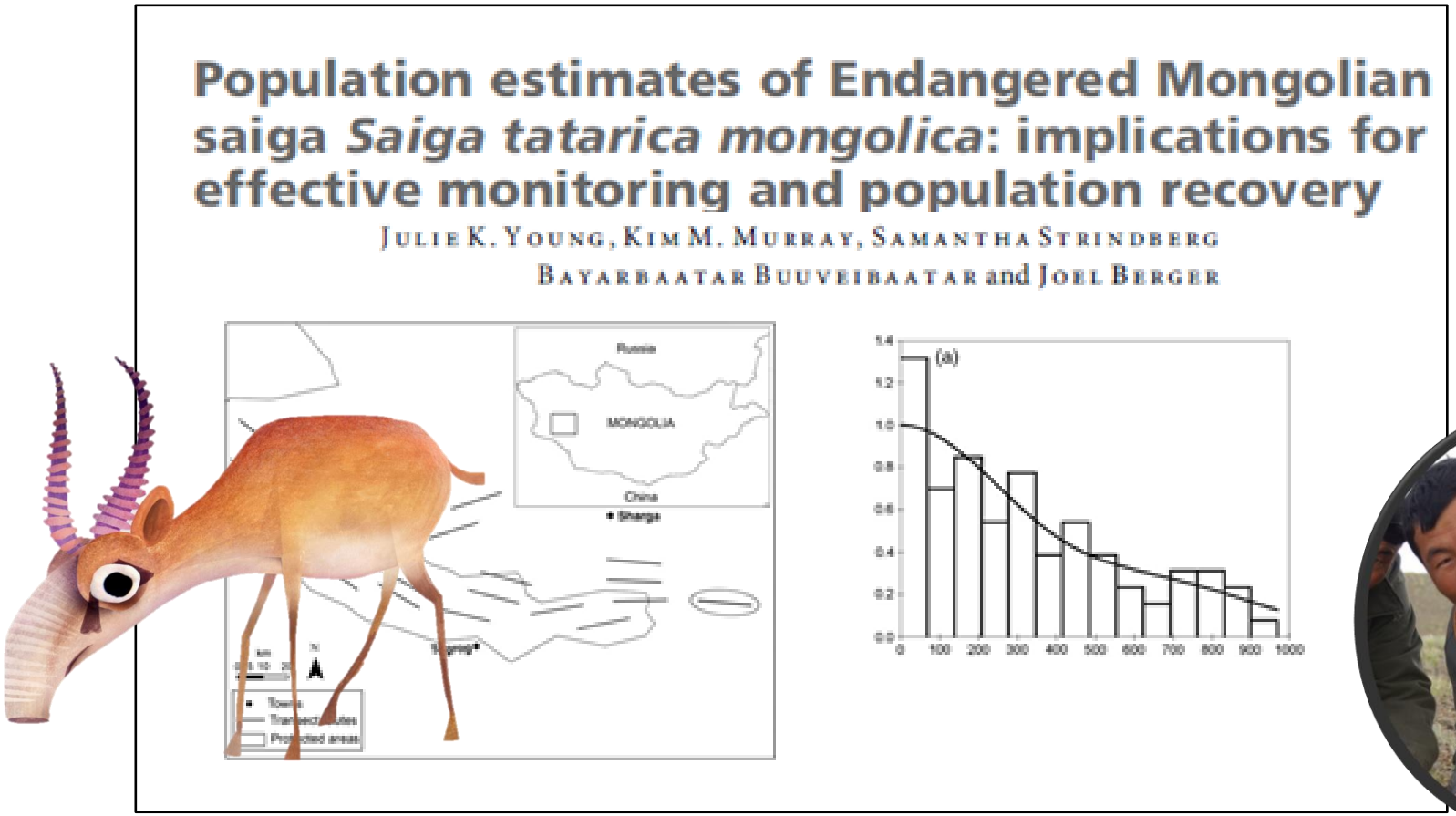
(*China and Russia block satellite transmission)

Collars help discover population centers



Discover overlap with livestock

Ultimately estimate population sizes



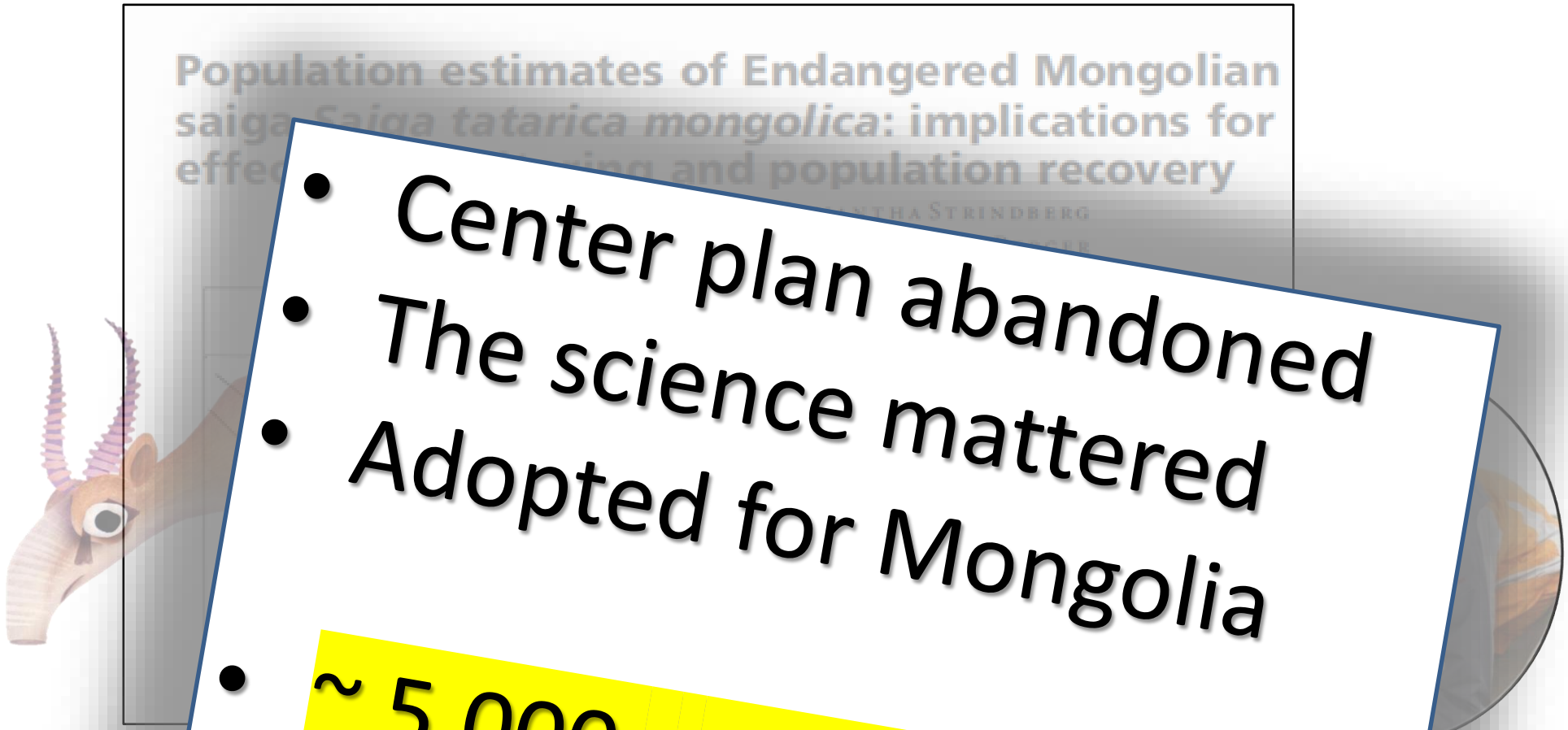
Population estimates of Endangered Mongolian saiga *Saiga tatarica mongolica*: implications for effective monitoring and population recovery

JULIE K. YOUNG, KIM M. MURRAY, SAMANTHA STRINDBERG
BAYARBAATAR BUUVEIBAATAR and JOEL BERGER

Brenden Wenzel

WCS

Result:



- Center plan abandoned
- The science mattered
- Adopted for Mongolia
- ~ 5,000 - 9000 saiga

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Saiga to Pronghorn

Contrast Migration

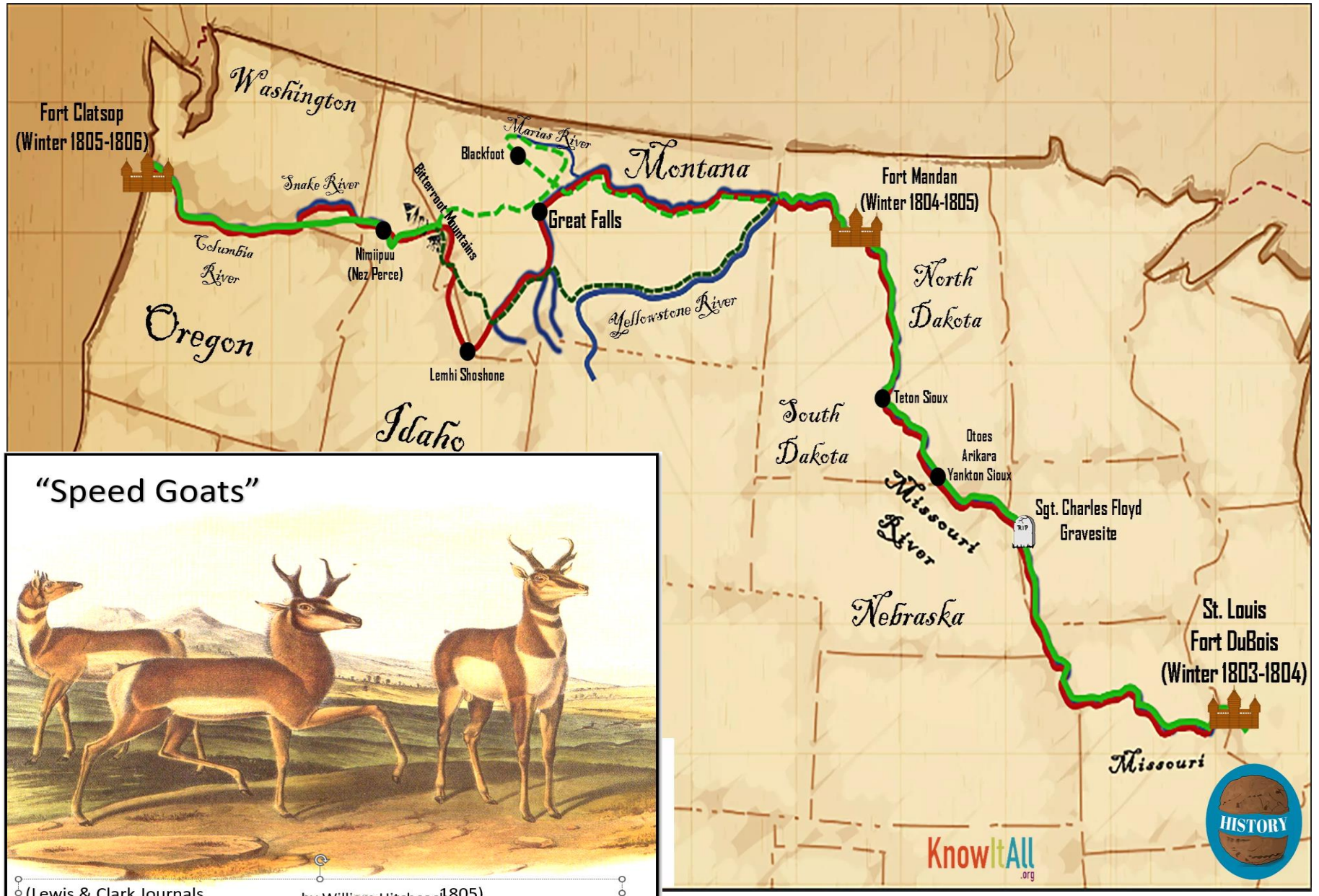
Colorado State University

WILDLIFE CONSERVATION SOCIETY

Migrants Across Air, Land, & Water

How to sustain long distance migration?

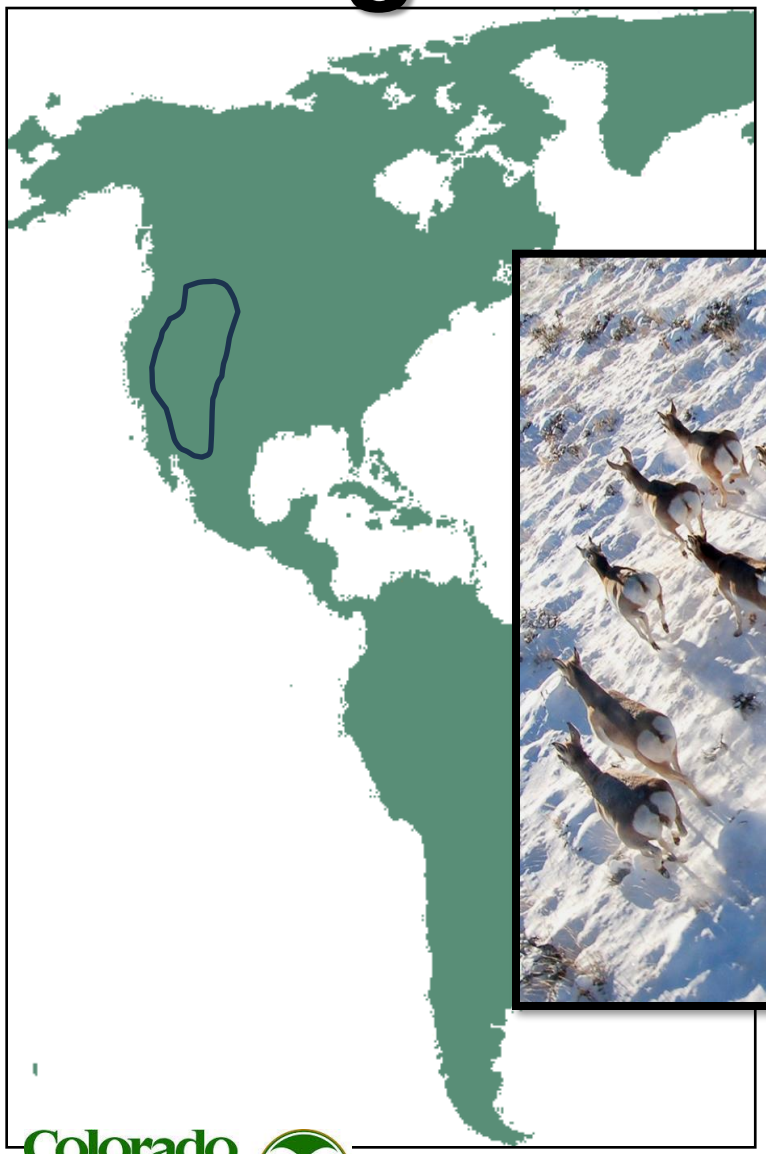
Lewis and Clark Expedition



Wyoming – More Pronghorn than People

Pinedale

Migrations Beyond Parks



14 NPS units

Colorado State University

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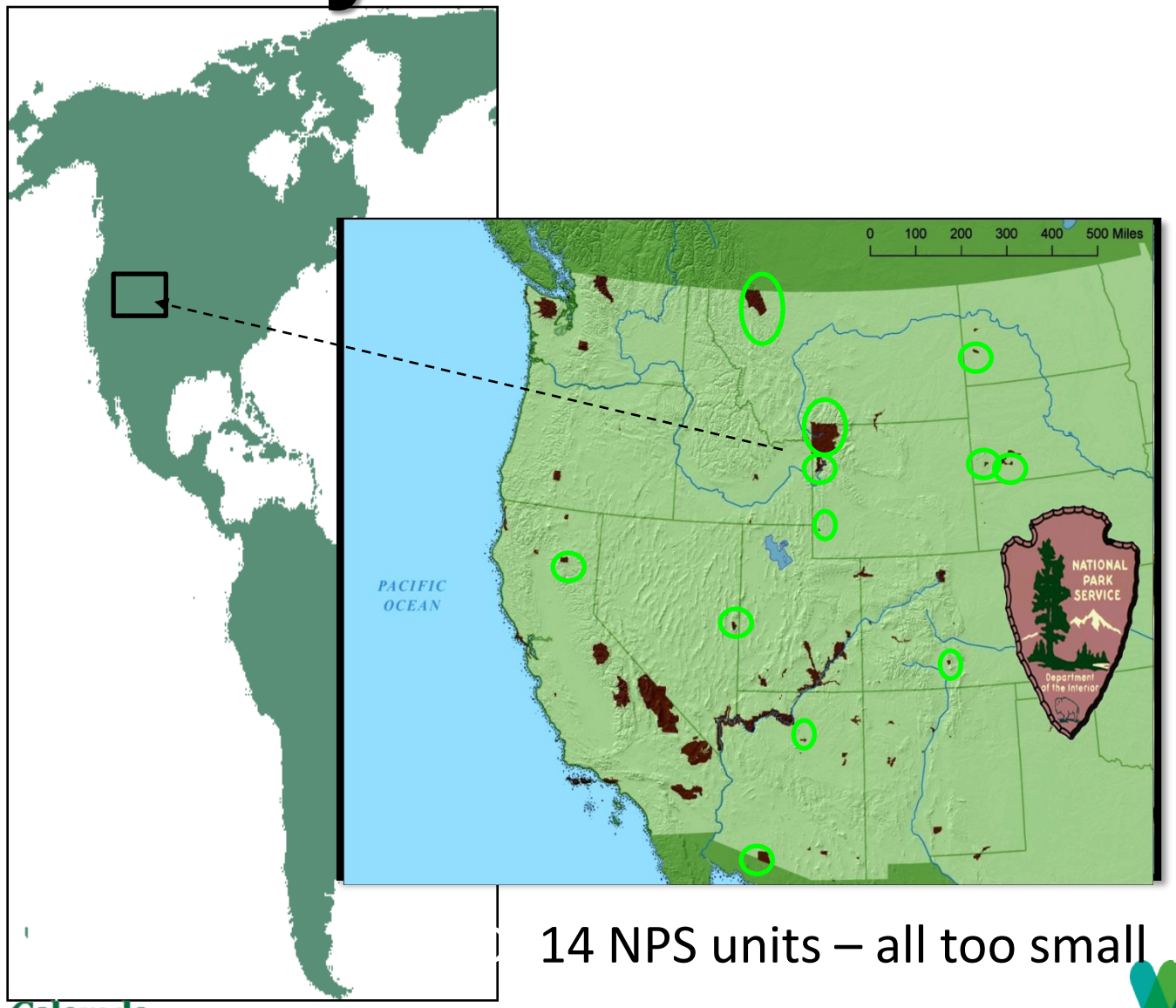
Every Park too Small



14 NPS units – all too small

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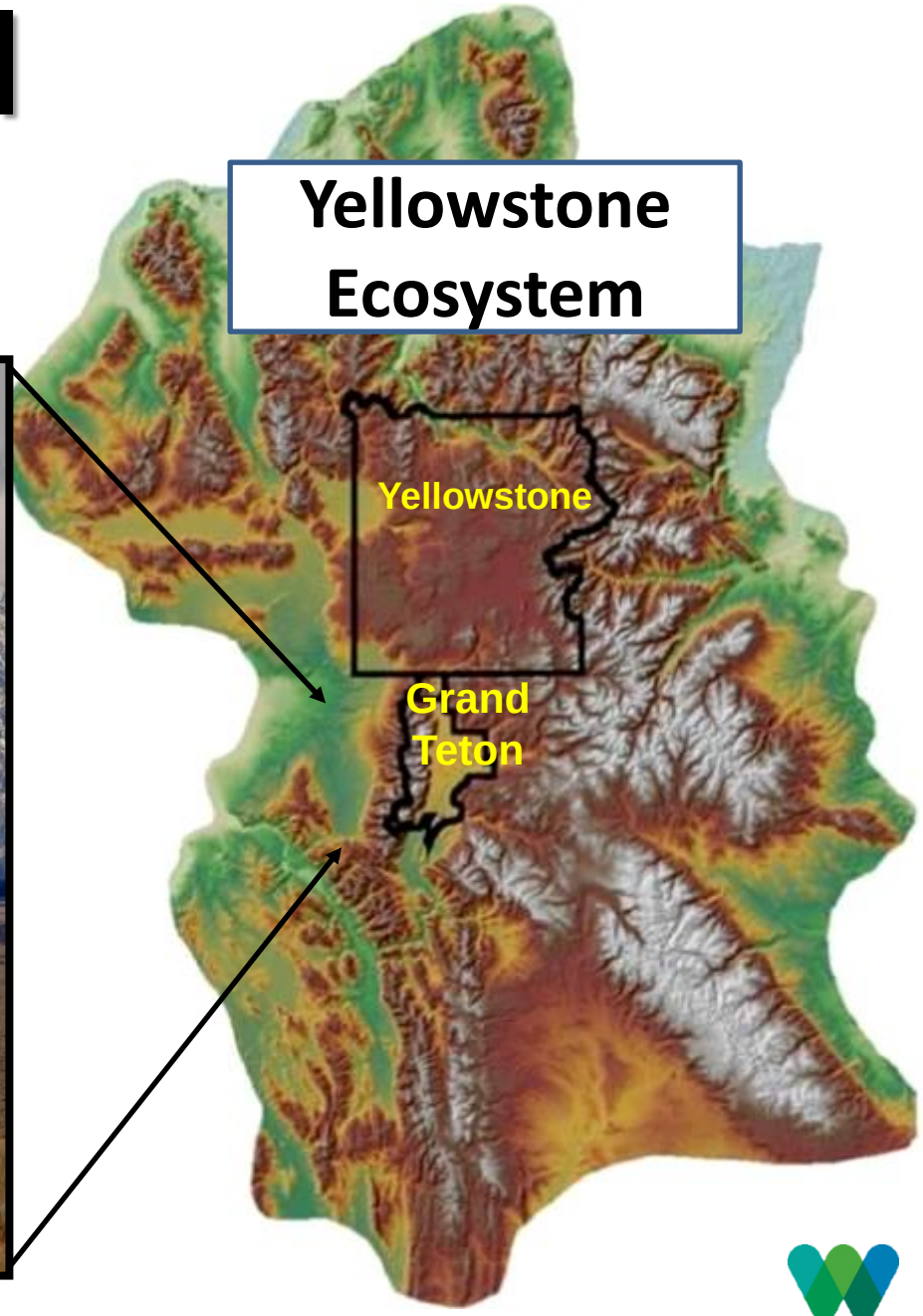
The Regional Setting



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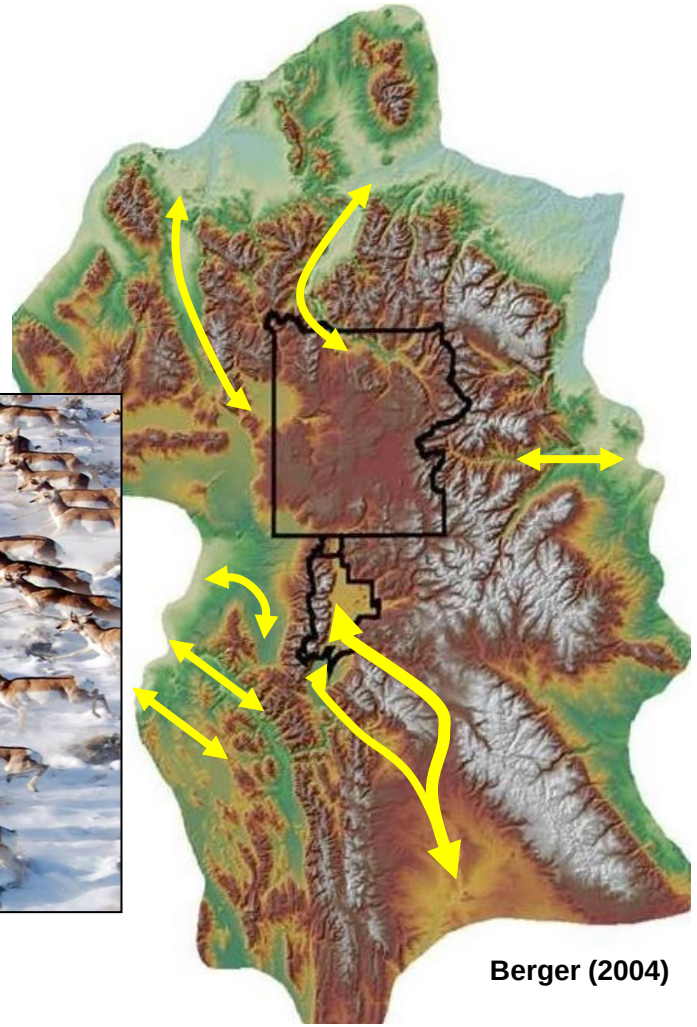
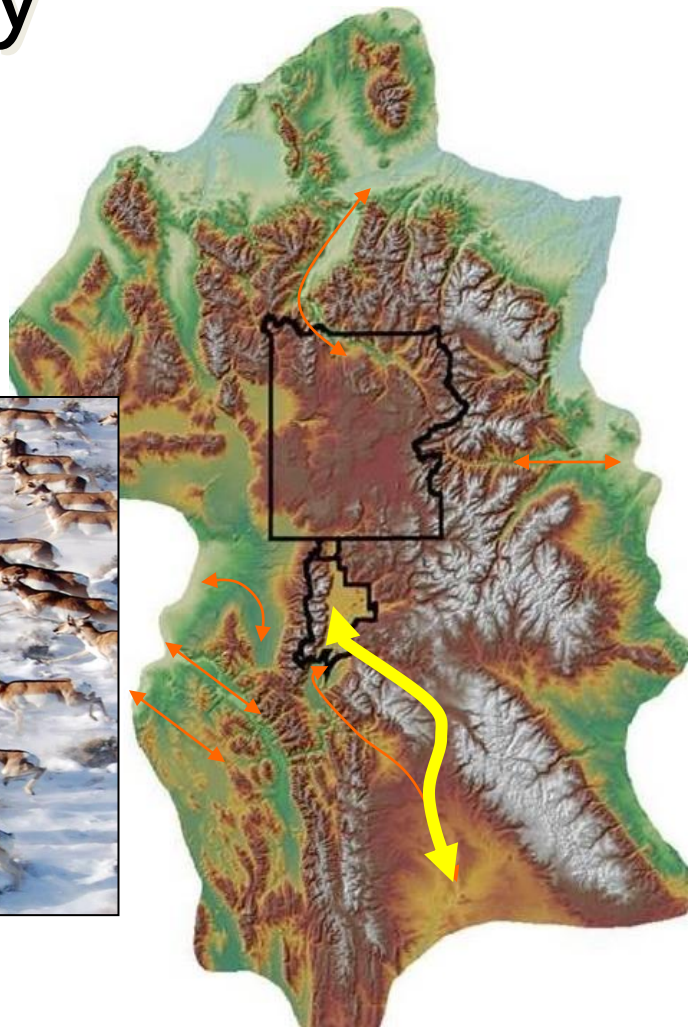
Known Historic Migration Routes (pre-1950)



Berger (2004)

Remaining Today
(88% lost)



Why Migrate?

1- Avoid Deep Snow; 2 - Access Food

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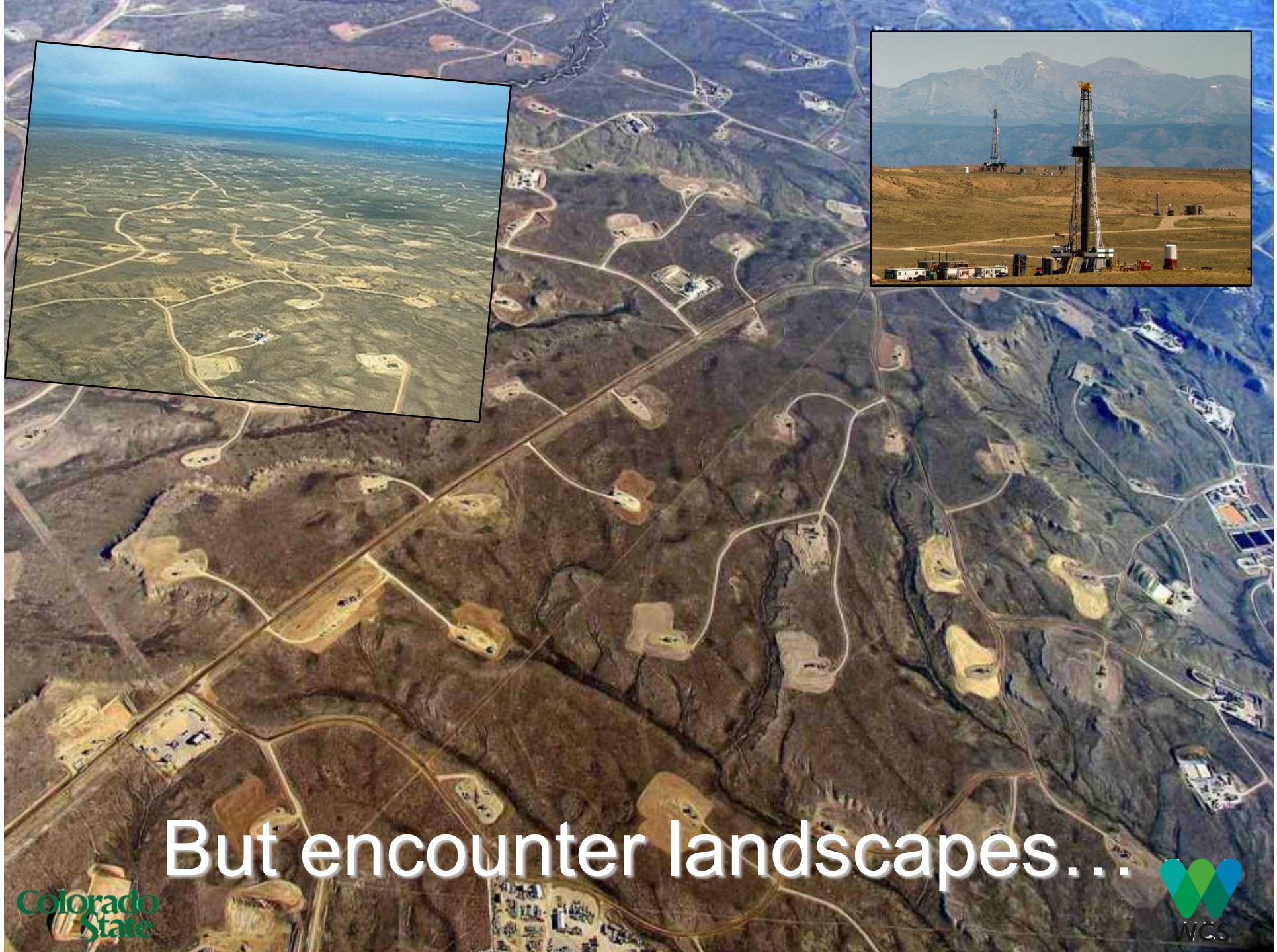
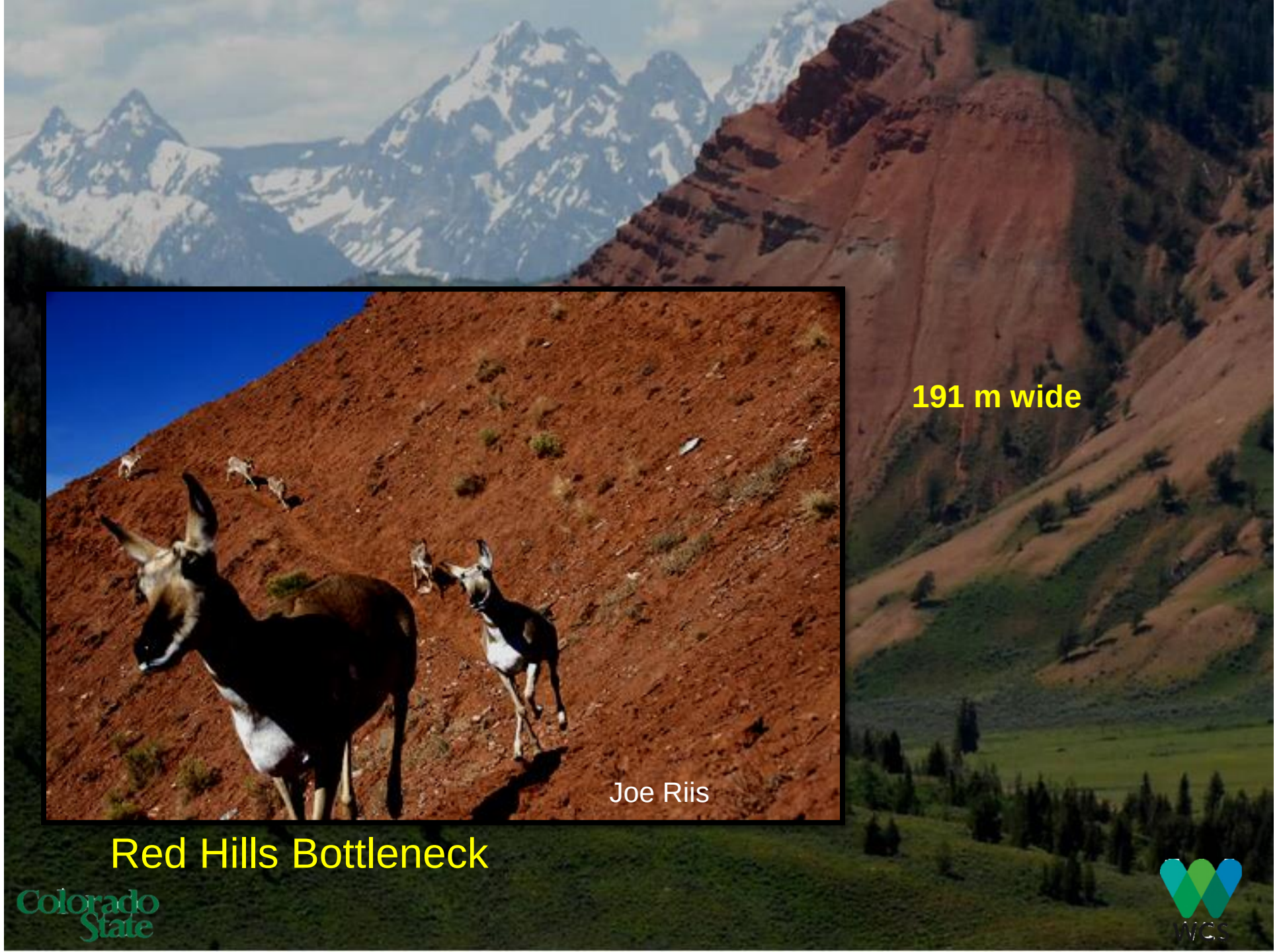
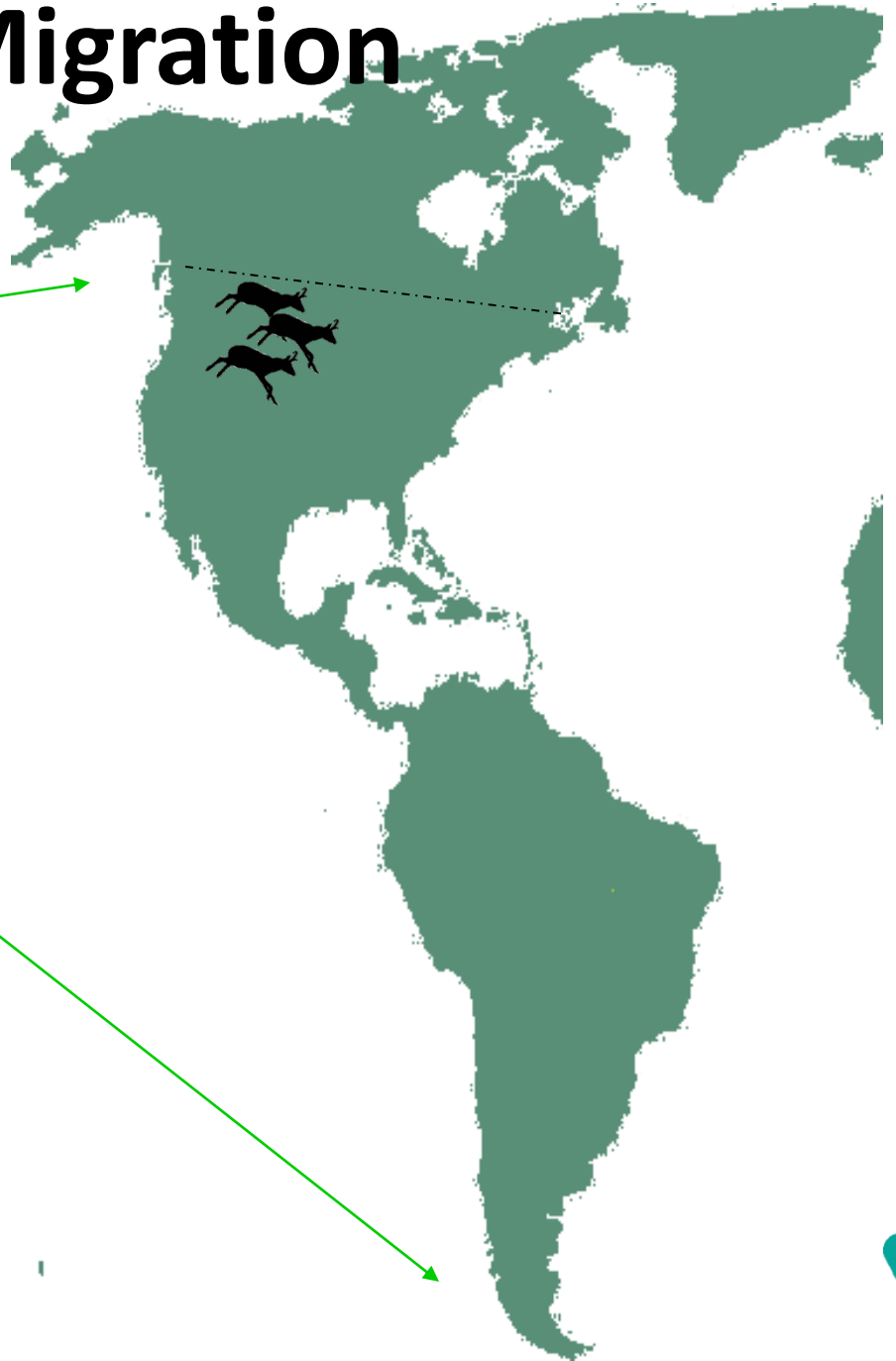

But encounter landscapes…
Colorado State
WGS


191 m wide
Joe Riis
Red Hills Bottleneck
Colorado State
WCS

GOAL – Protect Migration Corridor



- Canada to Tierra del Fuego
- 2nd Longest for Terrestrial Mammal

Colorado State University

WCS

Grand Teton

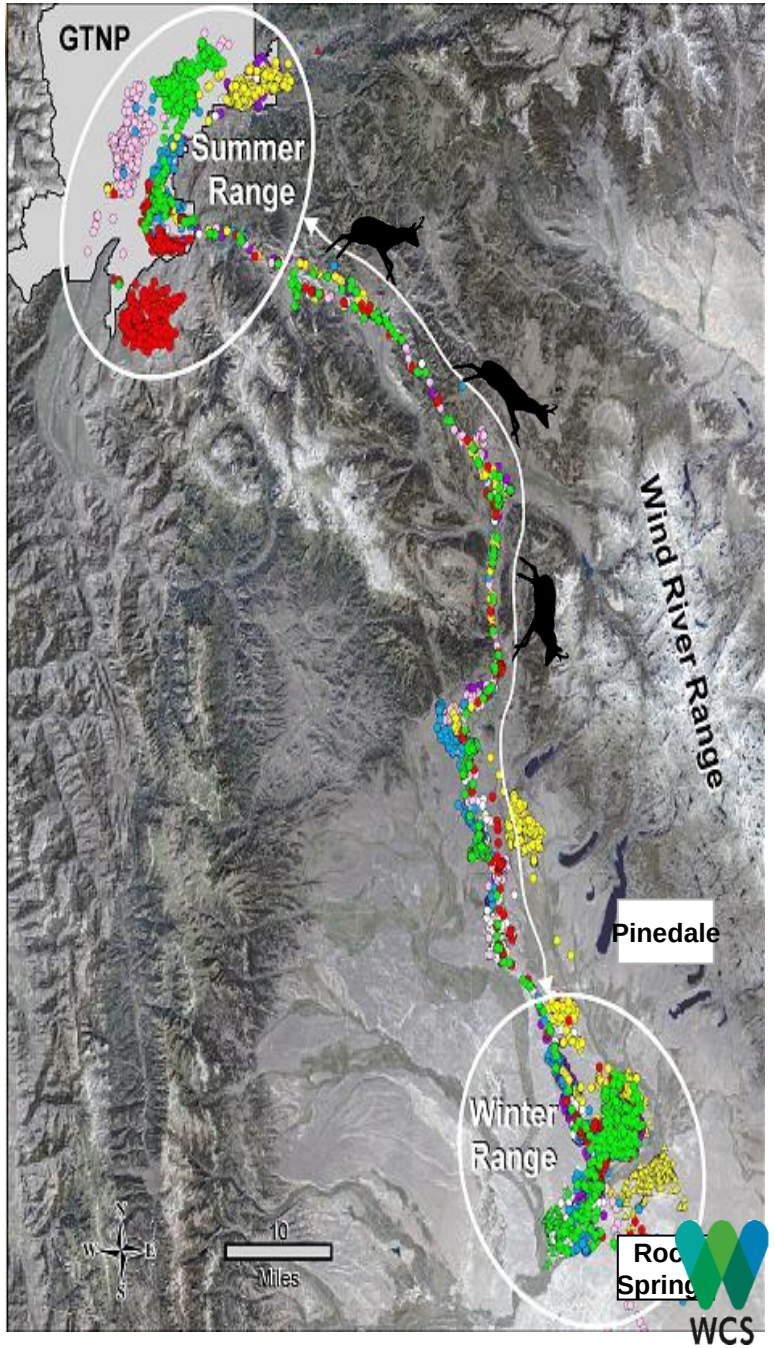
Collaboration

WCS

NATIONAL PARK SERVICE

Department of the Interior

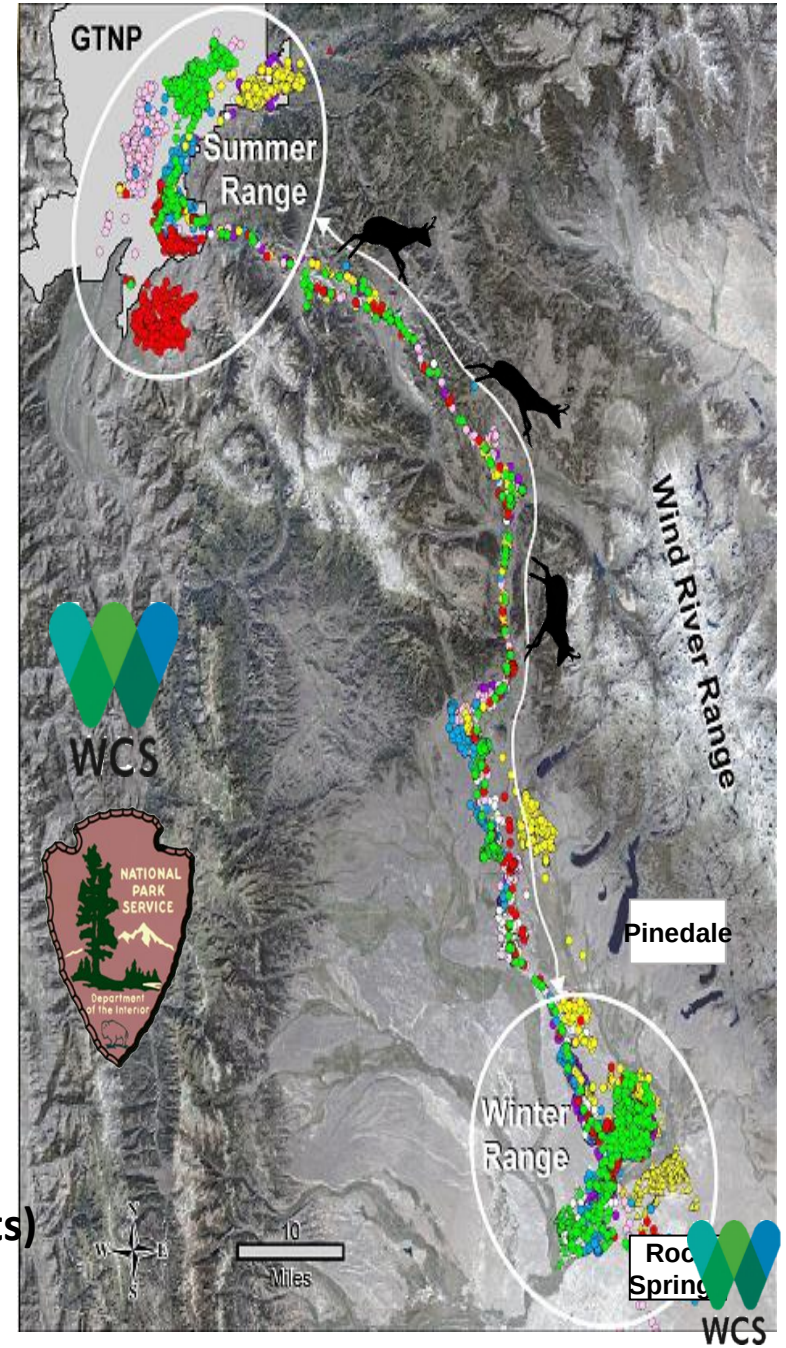
Goal – ID Migration Routes



Colorado State

Migration Corridor

120 miles
each way



GPS Data (N=76,000 pts)

Colorado State

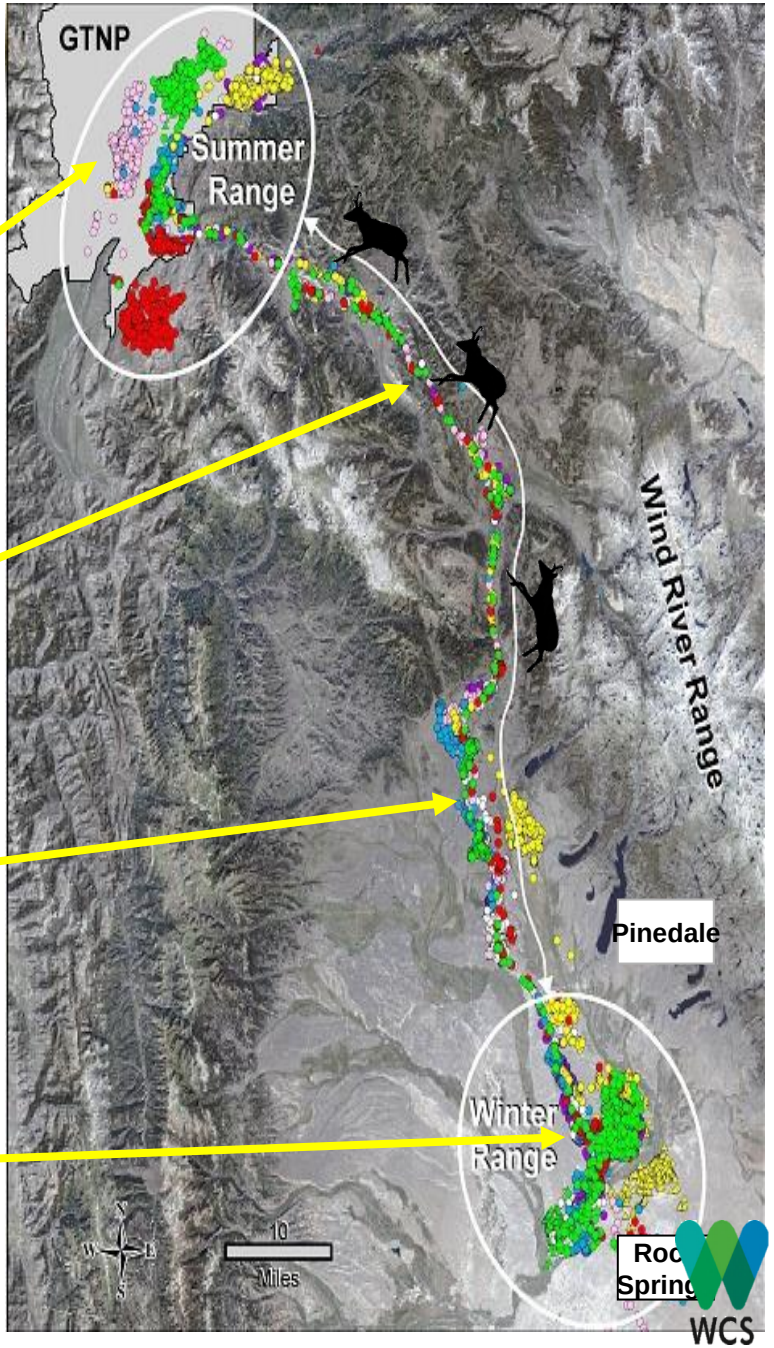
Complex Management

National Park Service

Forest Service

Private Land Owners

Bureau of Land Management



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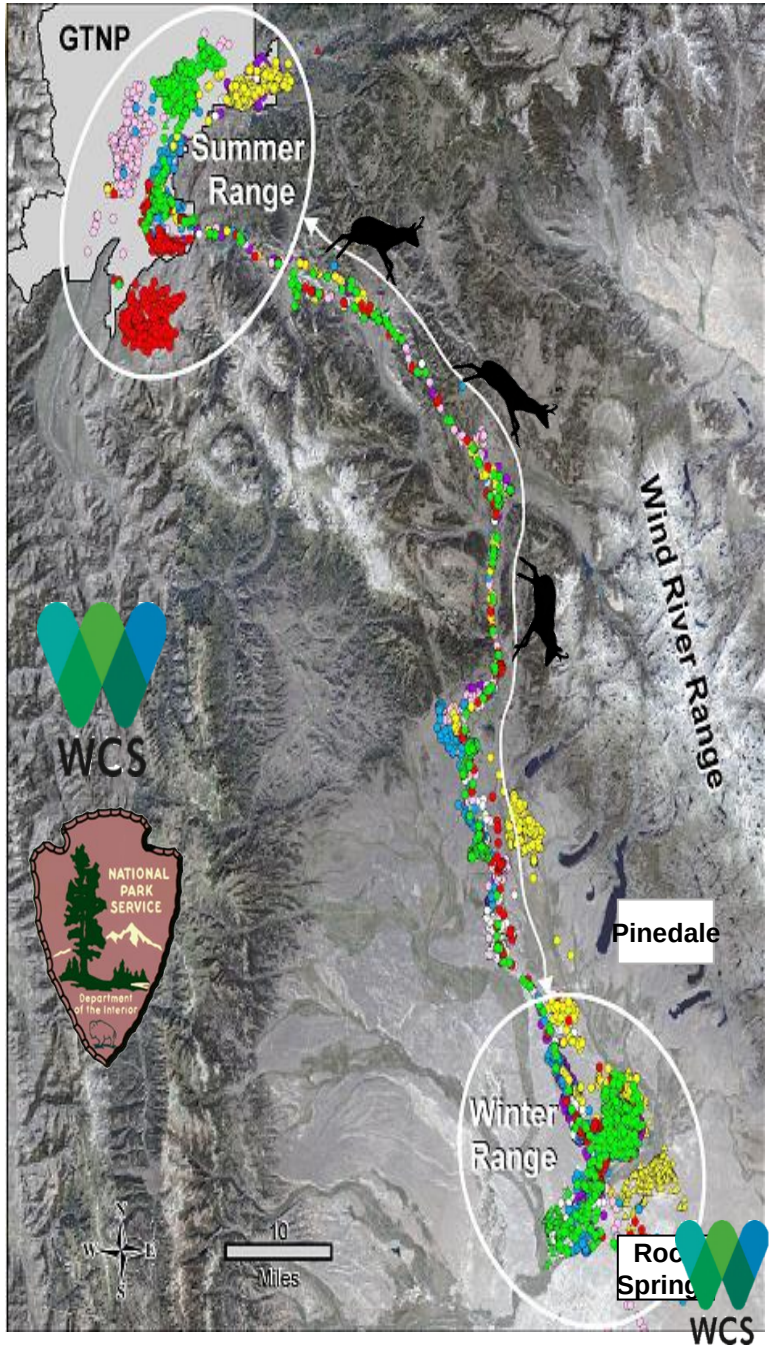
Bio-Cultural Relevance

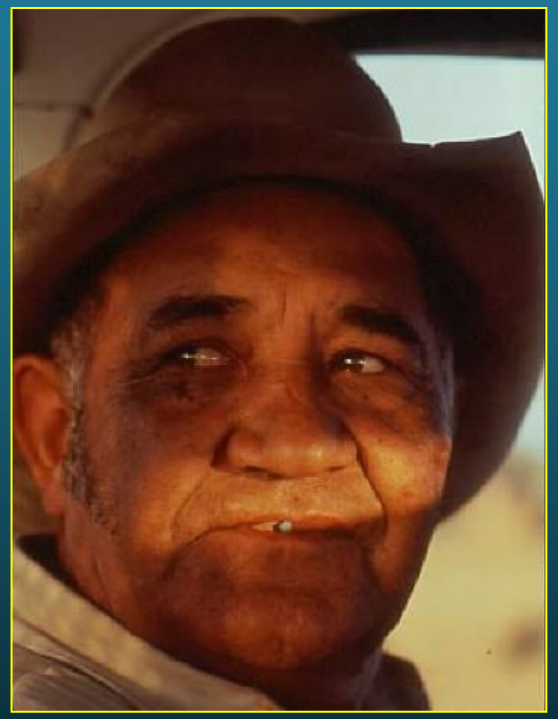
6000 yrs of harvest

Archeology – single pathway



Colorado State

Our approach – build support



County Commissioners

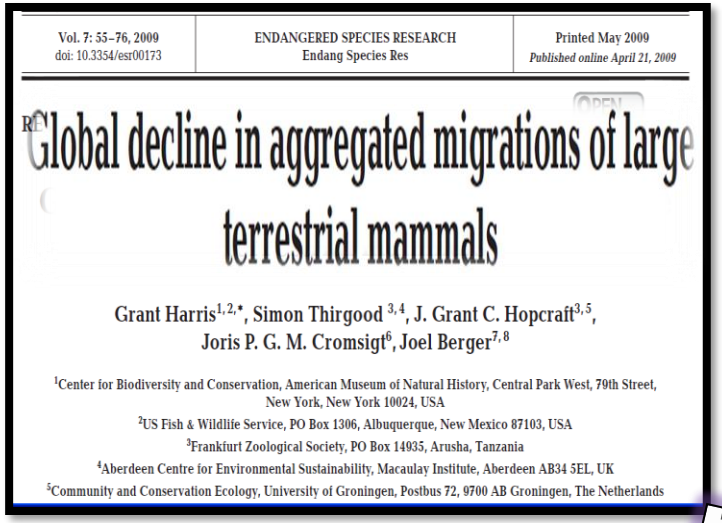
Our approach – build support

Town Hall Meetings

Path of the Pronghorn

Science - a small component

Studies



Vol. 7: 55–76, 2009
doi: 10.3354/esr00173

ENDANGERED SPECIES RESEARCH
Endang Species Res

Printed May 2009
Published online April 21, 2009

Global decline in aggregated migrations of large terrestrial mammals

Grant Harris[1,2,*], Simon Thirgood [3,4], J. Grant C. Hopcraft[3,5], Joris P. G. M. Cromsigt[6], Joel Berger[7,8]

[1]Center for Biodiversity and Conservation, American Museum of Natural History, Central Park West, 79th Street, New York, New York 10024, USA
[2]US Fish & Wildlife Service, PO Box 1306, Albuquerque, New Mexico 87103, USA
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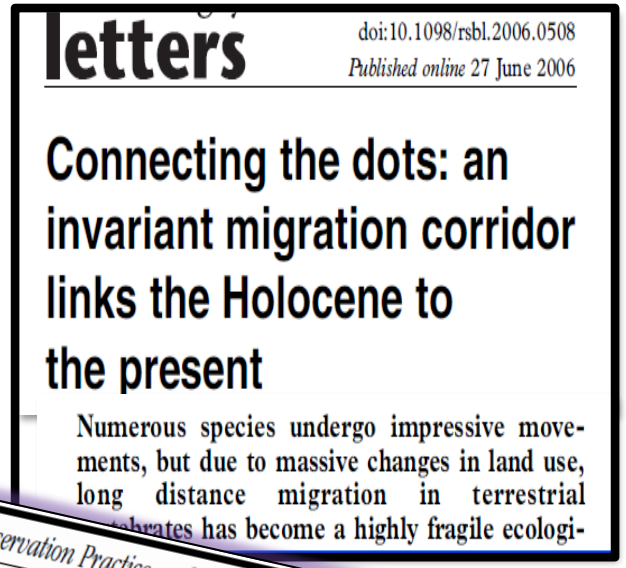
[4]Aberdeen Centre for Environmental Sustainability, Macaulay Institute, Aberdeen AB34 5EL, UK
[5]Community and Conservation Ecology, University of Groningen, Postbus 72, 9700 AB Groningen, The Netherlands

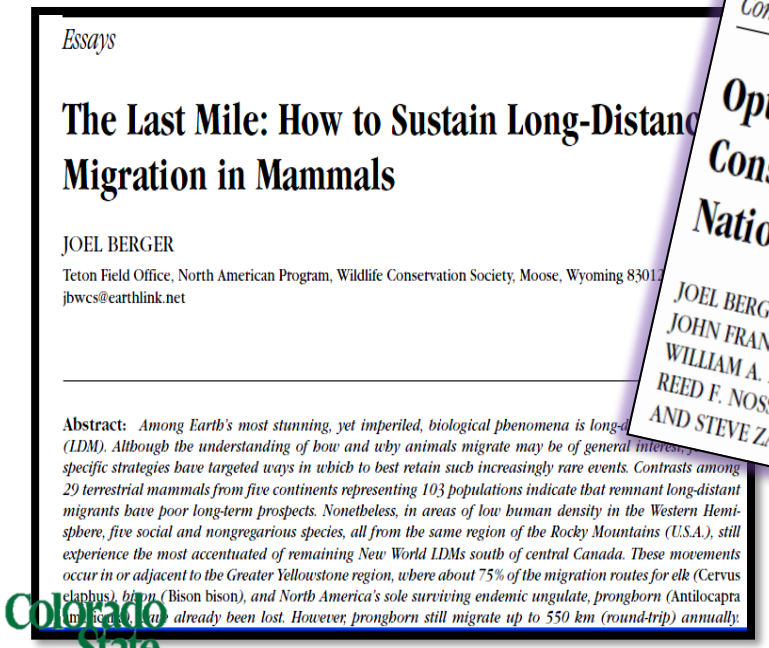


letters

doi:10.1098/rsbl.2006.0508
Published online 27 June 2006

Connecting the dots: an invariant migration corridor links the Holocene to the present

Numerous species undergo impressive movements, but due to massive changes in land use, long distance migration in terrestrial



Essays

The Last Mile: How to Sustain Long-Distanc Migration in Mammals

JOEL BERGER

Teton Field Office, North American Program, Wildlife Conservation Society, Moose, Wyoming 8301
jbwcs@earthlink.net

Abstract: *Among Earth's most stunning, yet imperiled, biological phenomena is long-d (LDM). Although the understanding of how and why animals migrate may be of general interes specific strategies have targeted ways in which to best retain such increasingly rare events. Contrasts among 29 terrestrial mammals from five continents representing 103 populations indicate that remnant long-distant migrants have poor long-term prospects. Nonetheless, in areas of low human density in the Western Hemisphere, five social and nongregarious species, all from the same region of the Rocky Mountains (U.S.A.), still experience the most accentuated of remaining New World LDMs south of central Canada. These movements occur in or adjacent to the Greater Yellowstone region, where about 75% of the migration routes for elk* (Cervus elaphus)*, bison* (Bison bison)*, and North America's sole surviving endemic ungulate, pronghorn* (Antilocapra americana) *already been lost. However, pronghorn still migrate up to 550 km (round-trip) annually.*

Conservation Practice and Policy

Optimism and Challenge for Science-Based Conservation of Migratory Species in and ou National Parks

JOEL BERGER,*† STEVEN L. CAIN,‡ ELLEN CHENG,§ PETER DRATCH,** KEVIN
JOHN FRANCIS,†† HERBERT C. FROST,‡‡ SCOTT GENDE,§§ CRAIG GROVES,
WILLIAM A. KARESH,††† ELAINE LESLIE,‡‡‡ GARY MACHLIS,§§§ RODRIGO A.
REED F. NOSS,†††† KENT H. REDFORD,‡‡‡‡ MICHAEL SOUKUP,§§§§ DAVID W
AND STEVE ZACK†††††

Colorado State

WCS

Studies

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Conservation Practice and Policy 2014

Moving Beyond Science to Protect a Mammalian Migration Corridor

JOEL BERGER*† § AND STEVEN L. CAIN‡

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Colorado State

WCS

Media Coverage -

26A - JACKSON HOLE NEWS&GUIDE, Wednesday, M

Land managers

back pronghorn protection

proposes saving key migration route.

By Rebecca Huntington

Grand Teton National Park and Bridger-Teton National Forest leaders said they would support an initiative to permanently protect the rare 180-mile, round-trip migration of pronghorn across park and forest lands.

The bulk, or 92 percent, of

Hamilton pointed to her dec sion not to allow oil and g leasing on 376,000 acr between Togwotee Pass a the Hoback Basin, whi would have encompasse part of the migration route.

"I guess we're the maj landowner along this migr tion route," Hamilton sa "We are very interested doing whatever we can in t Forest Service to make su that migration continues."

Only several hundred

38A - JACKSON HOLE NEWS&GUIDE, Wednesday, May 24, 2006

Biologist: Protect pronghorn migration route

Longest terrestrial journey in Lower 48 threatened by development.

By Cory Hatch

For more than 5,800 years, pronghorn have made the longest land migration in the lower 48 states, 180 miles round-trip between their winter range south of Pinedale to their summer home in Grand Teton National Park.

Pronghorn once used a few paths to complete their annual journey to Jackson Hole from the Upper Green River valley. Slightly more than 200 years of human development have effectively blocked all but one narrow corridor.

Immortalized as "antelope" in the ballad "Home on the Range," the pronghorn of Jackson Hole face an uncertain future if too many people realize the dream of that Western song. Biologists esti-

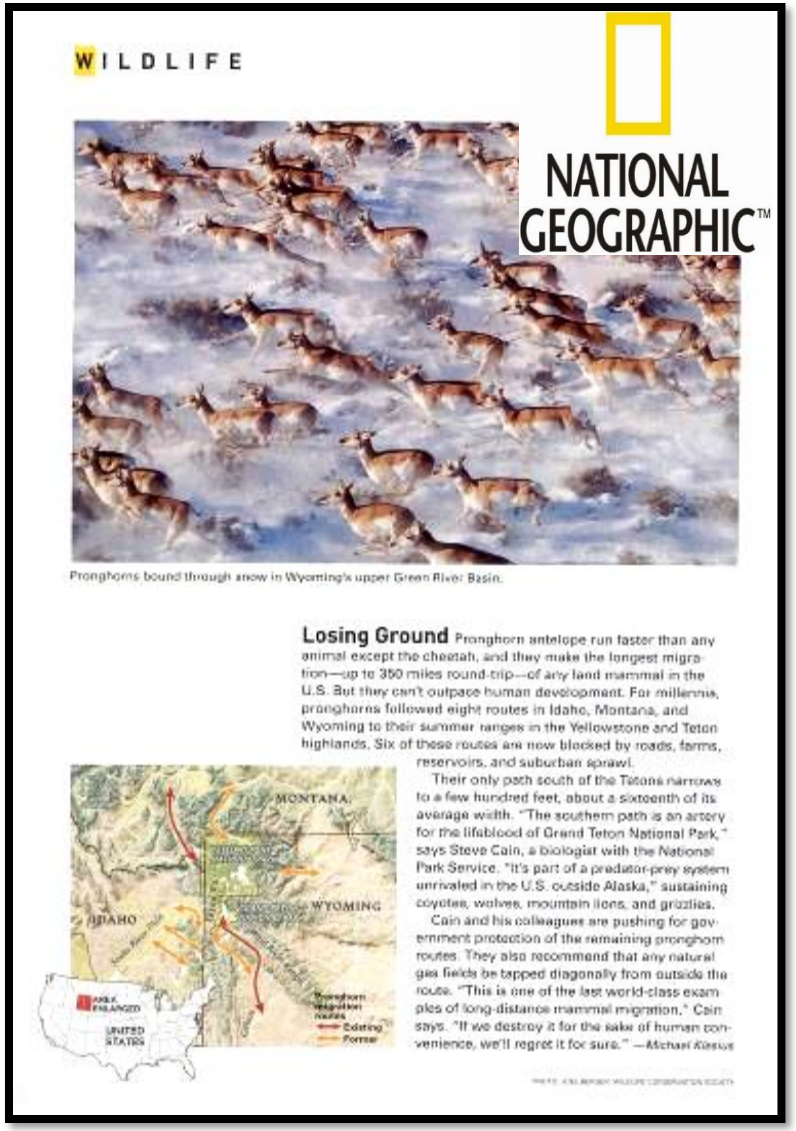
38A - JACKSON HOLE NEWS

Longest terrestrial journey in Lower 48 threatened by development.

By Cory Hatch

For more than 5,800 years, pronghorn have made the

Media Coverage - National



WILDLIFE

NATIONAL GEOGRAPHIC™

Pronghorns bound through snow in Wyoming's upper Green River Basin.

Losing Ground Pronghorn antelope run faster than any animal except the cheetah, and they make the longest migration—up to 350 miles round-trip—of any land mammal in the U.S. But they can't outpace human development. For millennia, pronghorns followed eight routes in Idaho, Montana, and Wyoming to their summer ranges in the Yellowstone and Teton highlands. Six of these routes are now blocked by roads, farms, reservoirs, and suburban sprawl.

Their only path south of the Tetons narrows to a few hundred feet, about a sixteenth of its average width. "The southern path is an artery for the lifeblood of Grand Teton National Park," says Steve Cain, a biologist with the National Park Service. "It's part of a predator-prey system unrivaled in the U.S. outside Alaska," sustaining coyotes, wolves, mountain lions, and grizzlies.

Cain and his colleagues are pushing for government protection of the remaining pronghorn routes. They also recommend that any natural gas fields be tapped diagonally from outside the route. "This is one of the last world-class examples of long-distance mammal migration," Cain says. "If we destroy it for the sake of human convenience, we'll regret it for sure." —Michael Klesius

Smithsonian departments

The pronghorn is arguably the world's fastest land animal: though a cheetah could beat it in a hundred-yard dash, the pronghorn would likely prevail at 400-meters and in a one-mile race, which it would finish in about a minute.

—"END OF THE ROAD?" PAGE 32

12 INDELIBLE IMAGES
TIME AFTER TIME
In a shuttered Alabama juke joint, the artist William Christenberry fixed upon a transformative subject
BY CAROLYN KLEINER BUTLER

18 MY KIND OF TOWN
BLEEVE IT, HON
The noted sportswriter charts the evolution of the idiosyncratic burg known as "Bawlmer"
BY FRANK DEFORD

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PALEOZOIC VERMONT
What is one of the world's oldest ocean reefs doing in the middle of the Green Mountain State? Making scientists very happy
BY DICK TERESI

97 PRESENCE OF MIND
DOCTOR FEELGOOD
Wracked by "vile melancholy," 18th-century critic Samuel Johnson didn't wallow in his misery—he fashioned a therapy to fix it
BY JOHN OBERLAND

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DESPERATELY SEEKING . . .

THIS PAGE: Each fall, pronghorns in Grand Teton National Park embark on the longest terrestrial migration in the contiguous United States, to their winter range some 120 miles to the south. Photograph by Joe McDonald

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Colorado State

WCS

Op Eds

The New York Times

OP-ED CONTRIBUTOR

Let the Antelope Roam

By JOEL BERGER and KIM MURRAY BERGER
Published: August 9, 2006

Grand Teton National Park, Wyo.

Of all the species living in the Greater Yellowstone Ecosystem of northwest Wyoming, the pronghorn is the only one native to the American West — elk, bison and even grizzly bears moved in from Asia centuries ago — but it is by no means the least exotic.

The deerlike creatures (often called American antelope, though they a World antelope) are the fastest distance runners in the Western Hemi traveling 50 miles an hour. Twice a year for 6,000 years, one populat used that speed to travel more than 90 miles from their summer rang

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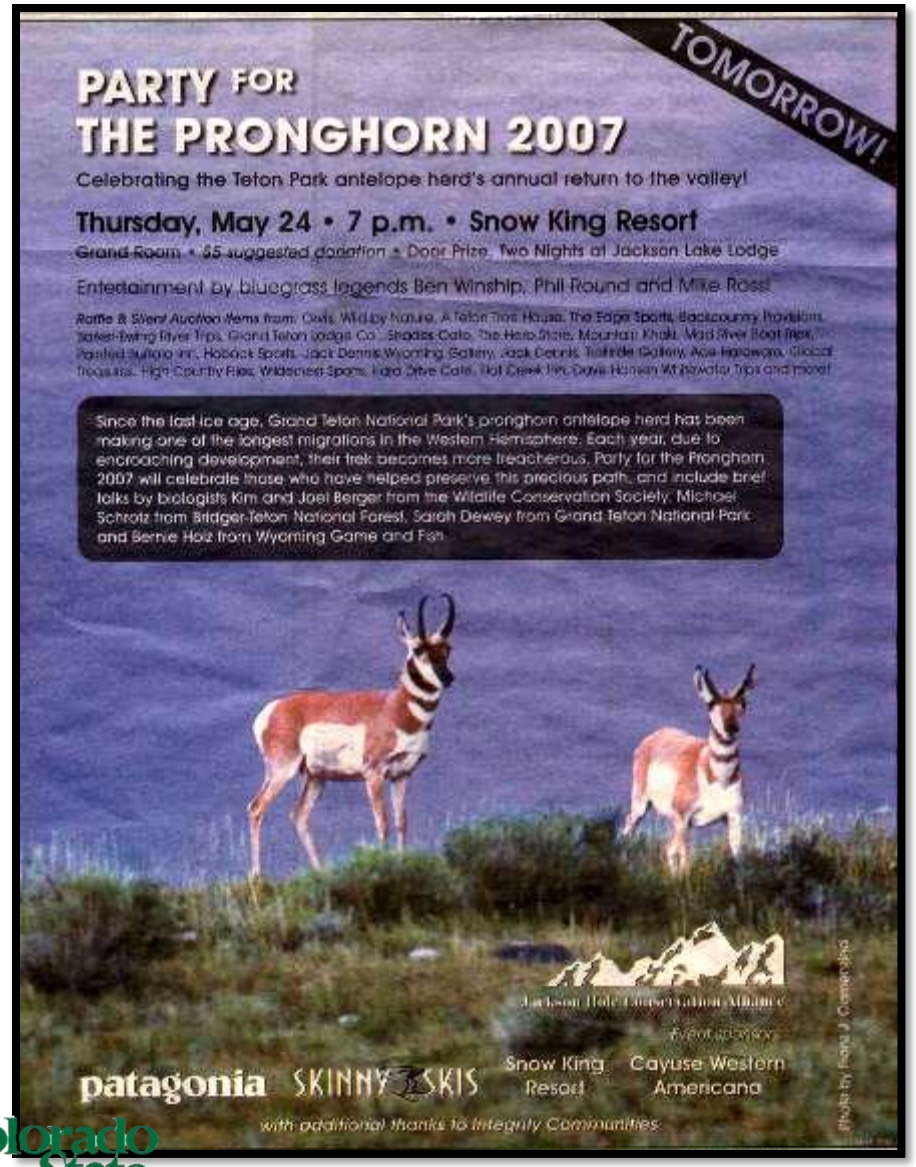
Annual Celebrations



- **Business Community**

Jackson Hole
Conservation Alliance

Colorado State

WCS

County Support

BOARD OF COMMISSIONER

TETON COUNTY WYOMING

Monday, September 11, 2006

Governor Dave Freudenthal
State Capitol, 200 West 24th Street
Cheyenne, Wyoming 82002

Dear Governor Freudenthal,

On August 2, 2006 our boards jointly listened to a talk given by Louise Lasley of the Wildlife Conservation Society (WCS) regarding the permanent protection of a pronghorn migration corridor between Grand Teton National Park and Sublette County. We learned this is the second longest terrestrial migration in the western hemisphere, and that it is currently threatened by energy and increasing private land developments.

The WCS has put together an impressive presentation on this issue, and we encourage leaders around the state to invite Ms. Lasley to speak to them about the pronghorn corridor. Beyond education, the organization has developed a clear plan using field-based science for protecting one of our iconic Wyoming species. For instance, one simple solution for keeping the route passable by antelope, which primarily only go under fences, is to build wildlife friendly fences so that the animals may pass through safely.

This letter is to apprise you of our strong support of a designated migration corridor for the pronghorn antelope. Additionally, we request that you also consider advocating for the WCS's work in this regard and employ any means at your disposal to advance this conservation plan.

If you have questions of any of us, please do not hesitate to contact us. If you would like to speak directly to Ms. Lasley, she may be reached at 307-739-3037.

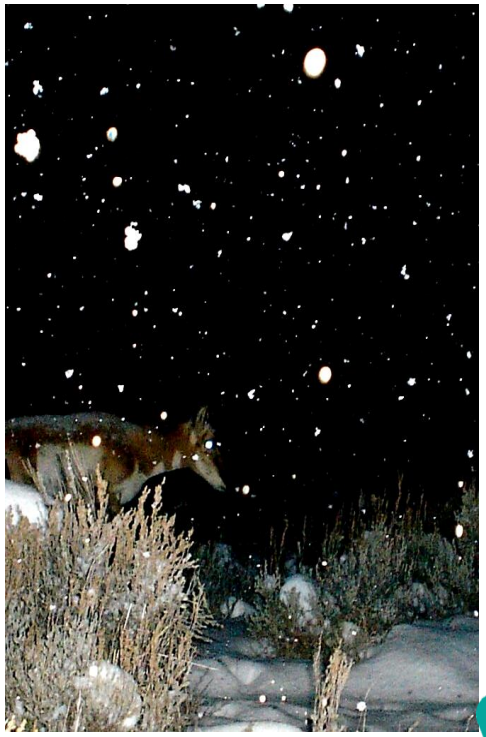
Most sincerely,

Leland Christensen, Chairman,
Teton County Board of Commissioners
Jim Darwich, Commissioner
Mike Gierau, Commissioner
Larry Jorgensen, Commissioner
Andy Schwartz, Commissioner

Mark Barron, Mayor
Mark Obringer, Vice Mayor
Scott Anderson, Town Councilman
Steve Harrington, Town Councilman
Abe Tabatabai, Town Councilman

CC: Senator Craig Thomas
Senator Mike Enzi
Representative Barbara Cubin
Kniffy Hamilton, Supervisor, Bridger Teton National Forest
Mary Gibson-Scott, Superintendent, Yellowstone National Park
Sublette County Commissioners

- **Board of Commissioners**
- **Chamber of Commerce**



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WCS

Wyoming Governor

Colorado State

WCS

Western Governor's Association

Policy Resolution 07-01

February 27, 2007

Washington, DC

Unanimous passage by 18 states

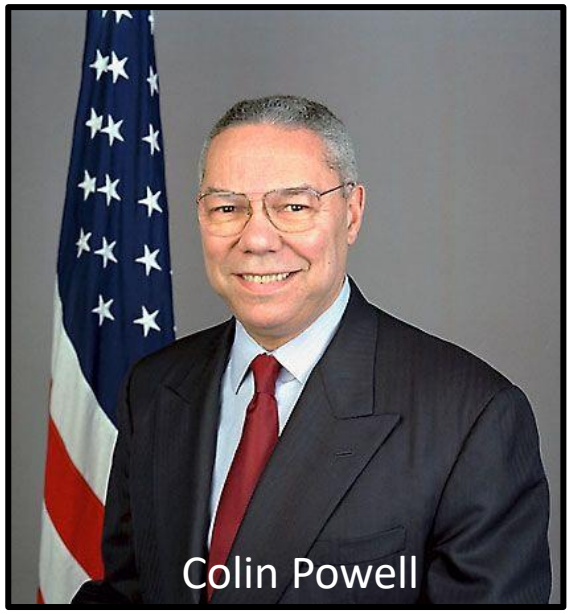
"...protecting wildlife migration corridors and crucial wildlife habitat in the West..."

Colorado State

WCS

Washington DC

Discuss/ Meet / Explain



Colorado State

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Support Letter

three federal agencies

Jackson Hole News&Guide

Environmental

Preserving the pronghorn corridor

B-T could amend Forest Plan to acknowledge migration route.

By Cory Hatch, Jackson Hole, Wyo.
February 6, 2008

Federal land managers last week signed a pledge supporting efforts to protect the "path of the pronghorn" from Sublette County to Jackson Hole, one of the longest mammal migration corridors in North America.

Heads of the Bridger-Teton National Forest, Grand Teton National Park and the National Elk Refuge signed the letter in a what they said is largely a symbolic gesture. The Bureau of Land Management, which oversees part of the migration route, did not participate.

Scientists with the Grand Teton National Park and the Wildlife Conservation Society have attached GPS collars on pronghorn in Jackson Hole and Sublette County to document one of the longest migration corridors in North America.

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Federal Support Letter

Jackson Hole News&Guide

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- USFWS
- USFS
- NPS

Heads
Forest
the Na
letter
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Manag
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Scientists with the Grand Teton National Par and the Wildlife Conservation Society have attached GPS collars on pronghorn in Jackso Hole and Sublette County to document one the longest migration corridors in North Amer
PHOTO COURTESY JOEL BERGER

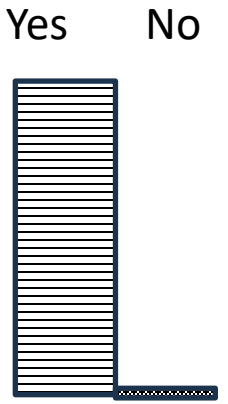
The pledge could have implications for Jackson Hole's pronghorn, according to

FEDERAL REGISTER

The Daily Journal of the United States Government

BRIDGER-TETON Forest News

Support Letters



N = 19,000 50

Colorado State University

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Environment News Service
International Daily Newswire Since 1990 We Cover the Earth for You

Anci n Path Becomes First U Migration Corridor

JACKSON, 08 (ENS) - To protect the 150-mile round-trip mo he Greater Yellowstone ecosystem, the U.S. Fores d the nation's first designated wildlife ath of the Pronghorn.

$1 Million to help Pronghorn

By The Associated Press

Story Published: Jul 1, 2008 at 7:15 PM MDT
Story Updated: Jul 1, 2008 at 7:15 PM MDT

JACKSON, WYOMING - **Interior Secretary Dirk Kempthorne has pledged $1 M** to help keep the pronghorn migration corridor open in western Wyoming.Kempthorne made the announcement Monday at the Western Governors' Conference in Jackson Hole.

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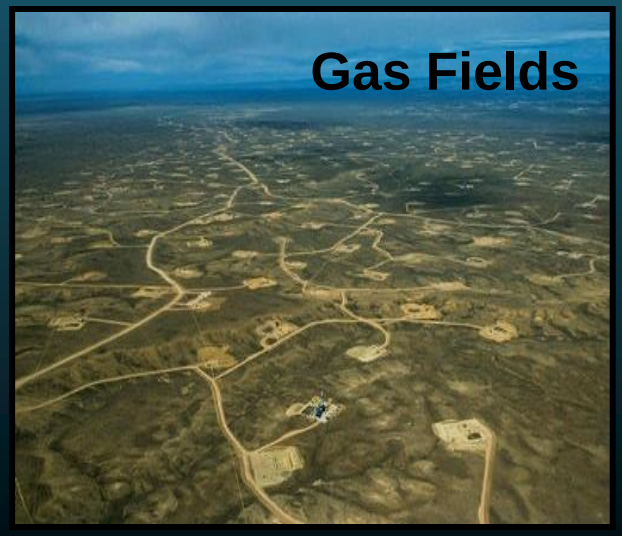
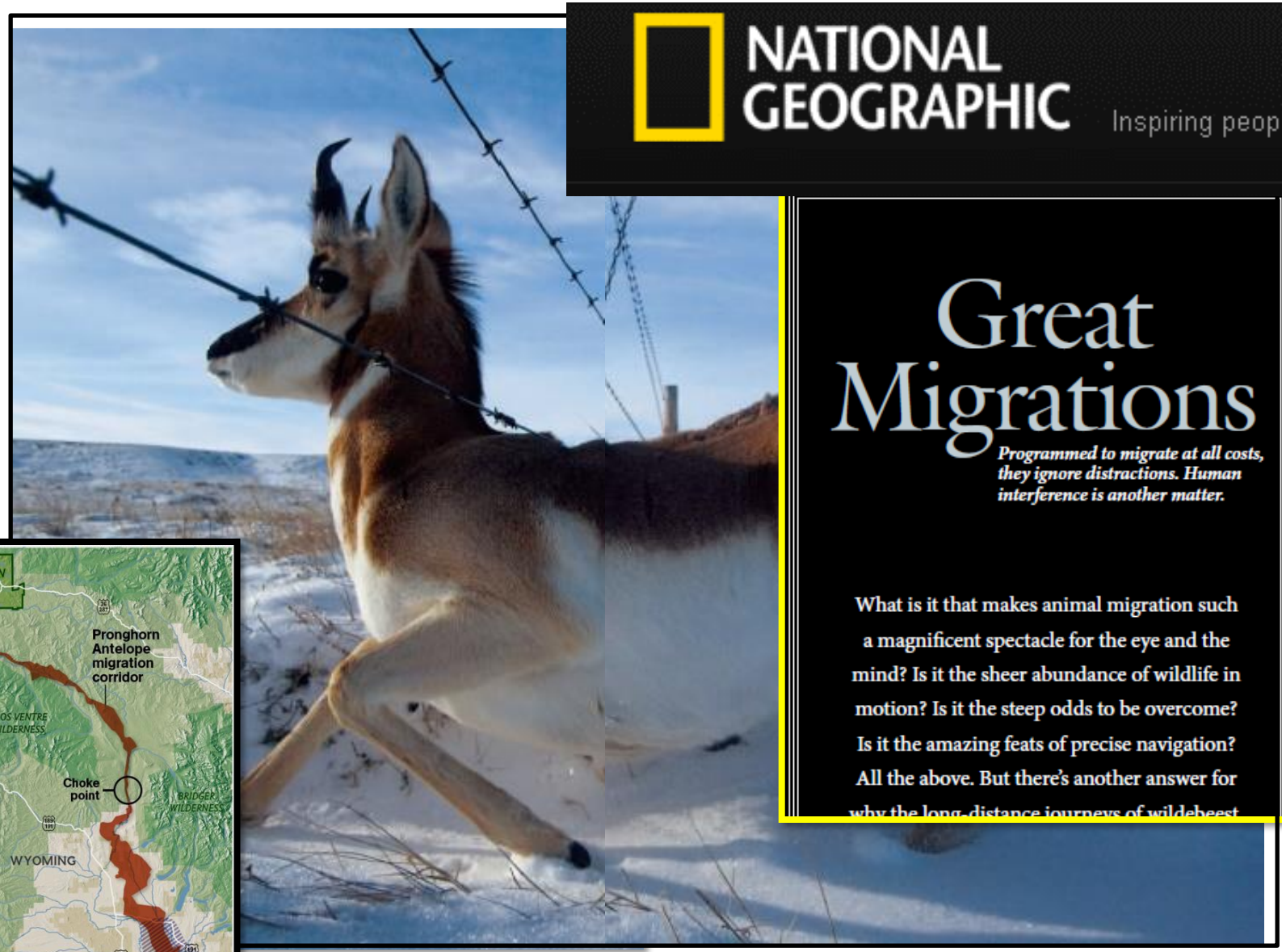
Elements of Protected Corridor

- Wildlife-friendly fencing only

J. Riis

- No surface gas development



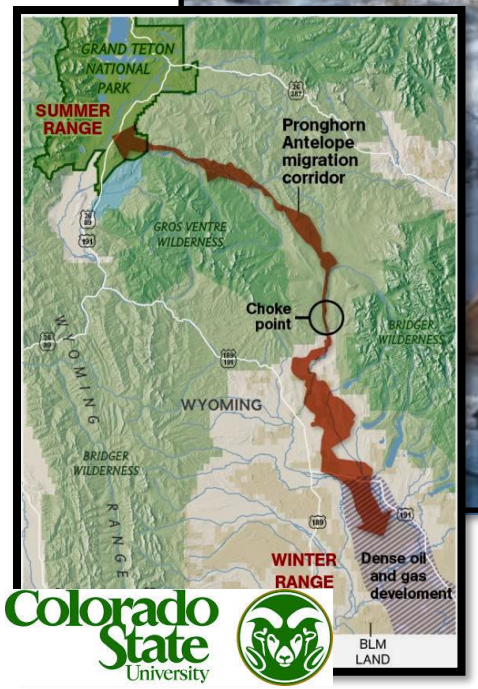


NATIONAL GEOGRAPHIC Inspiring peopl

Great Migrations

Programmed to migrate at all costs, they ignore distractions. Human interference is another matter.

What is it that makes animal migration such a magnificent spectacle for the eye and the mind? Is it the sheer abundance of wildlife in motion? Is it the steep odds to be overcome? Is it the amazing feats of precise navigation? All the above. But there's another answer for why the long-distance journeys of wildebeest



Colorado State University

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Over-Pass for Connectivity

WYOMING DEPARTMENT of TRANSPORTATION

$10 M

Colorado State University

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Co-Sponsors -

U.S. Senators Kamala D. Harris (D-Calif.), Cory A. Booker (D-N.J.), Jeff Merkley (D-Ore.), Ron Wyden (D-Ore.), Richard Blumenthal (D-Conn.), Bernie Sanders (D-Vt.), Sheldon Whitehouse (D-R.I.), and Jon Tester (D-Mont.). In the House, it is co-sponsored by **Representative Vern ı (R-Fla.)**.

Colorado State University

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Colorado State University

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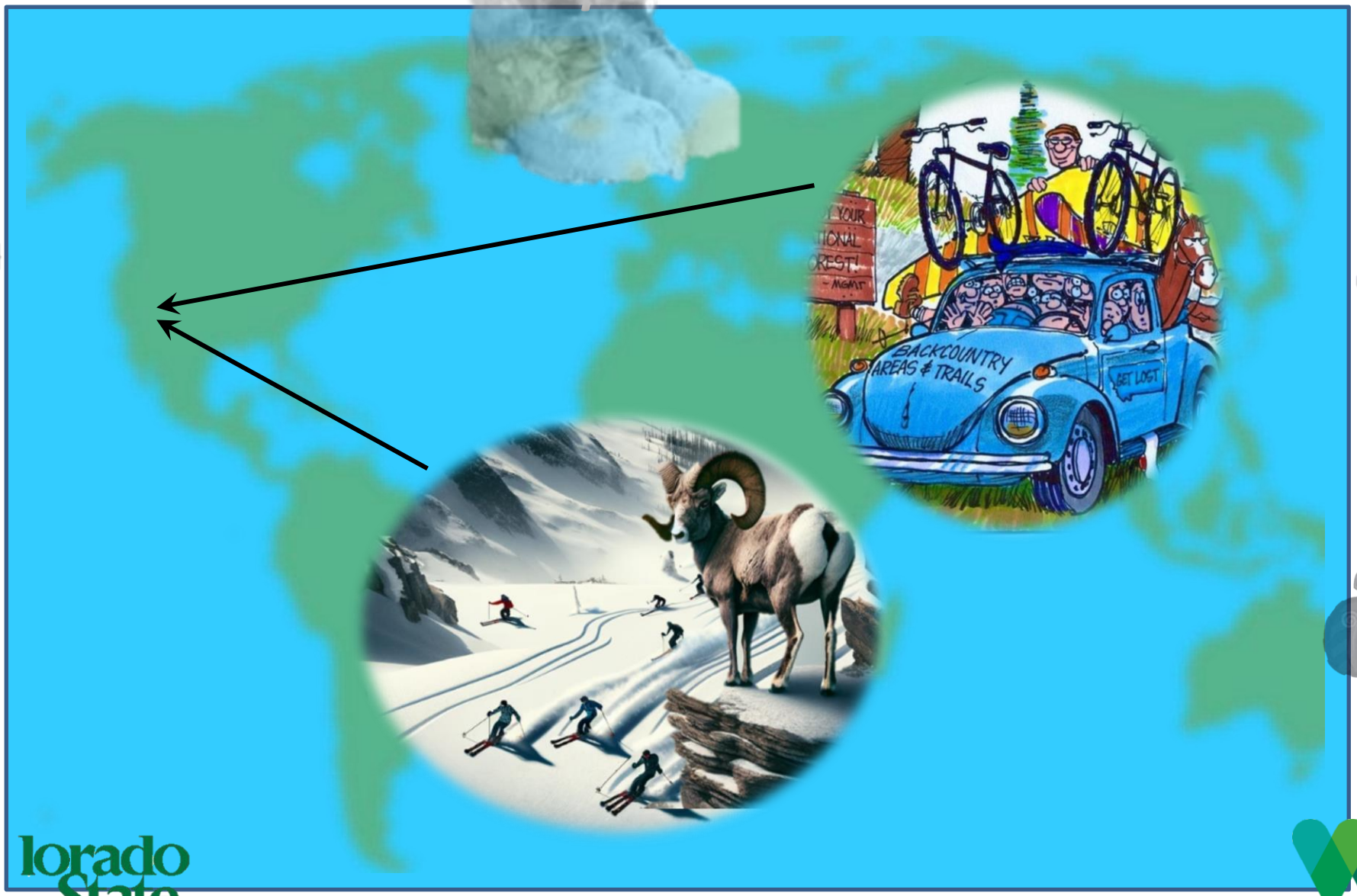
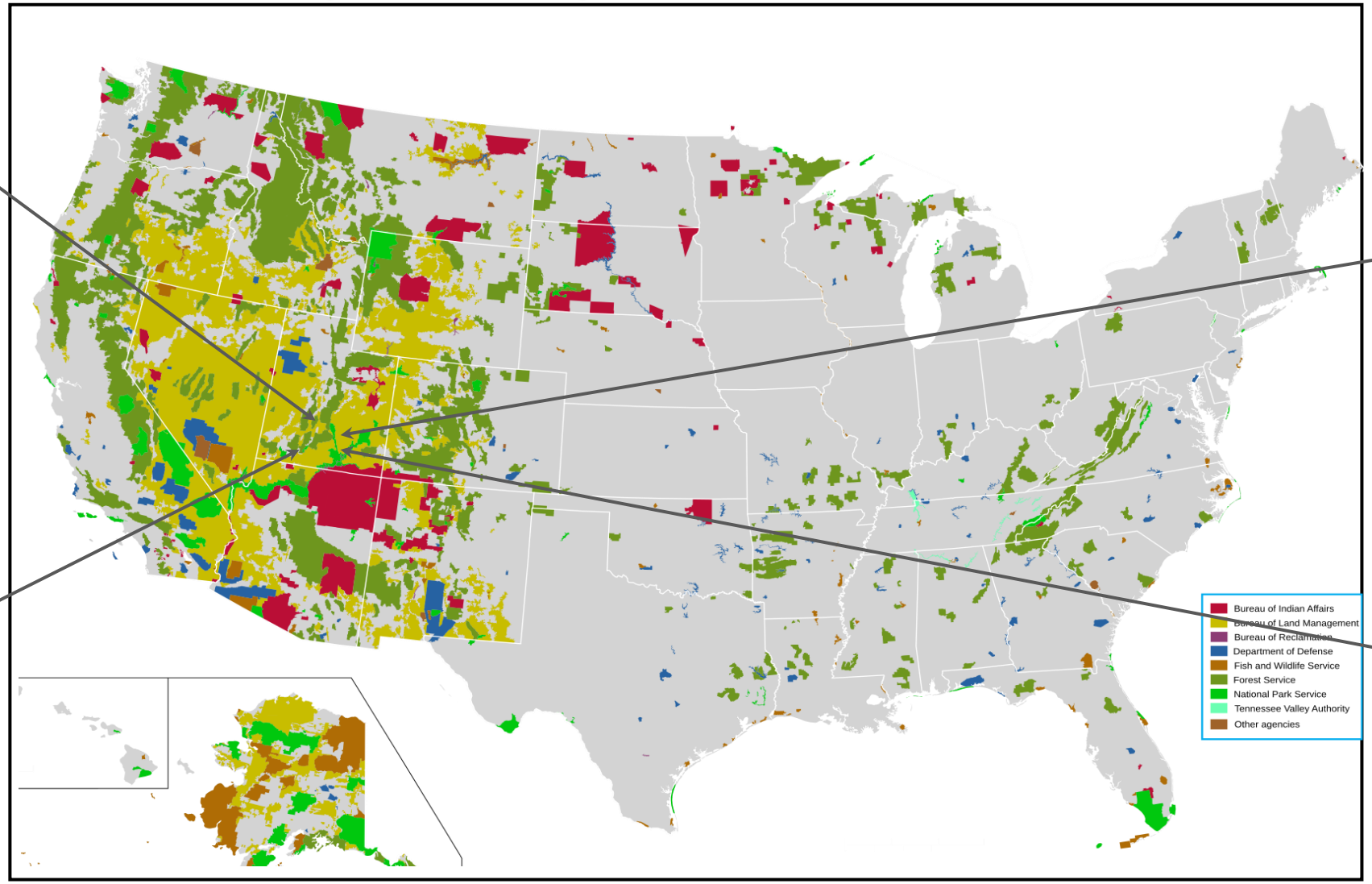
Last Vignette - Recreate



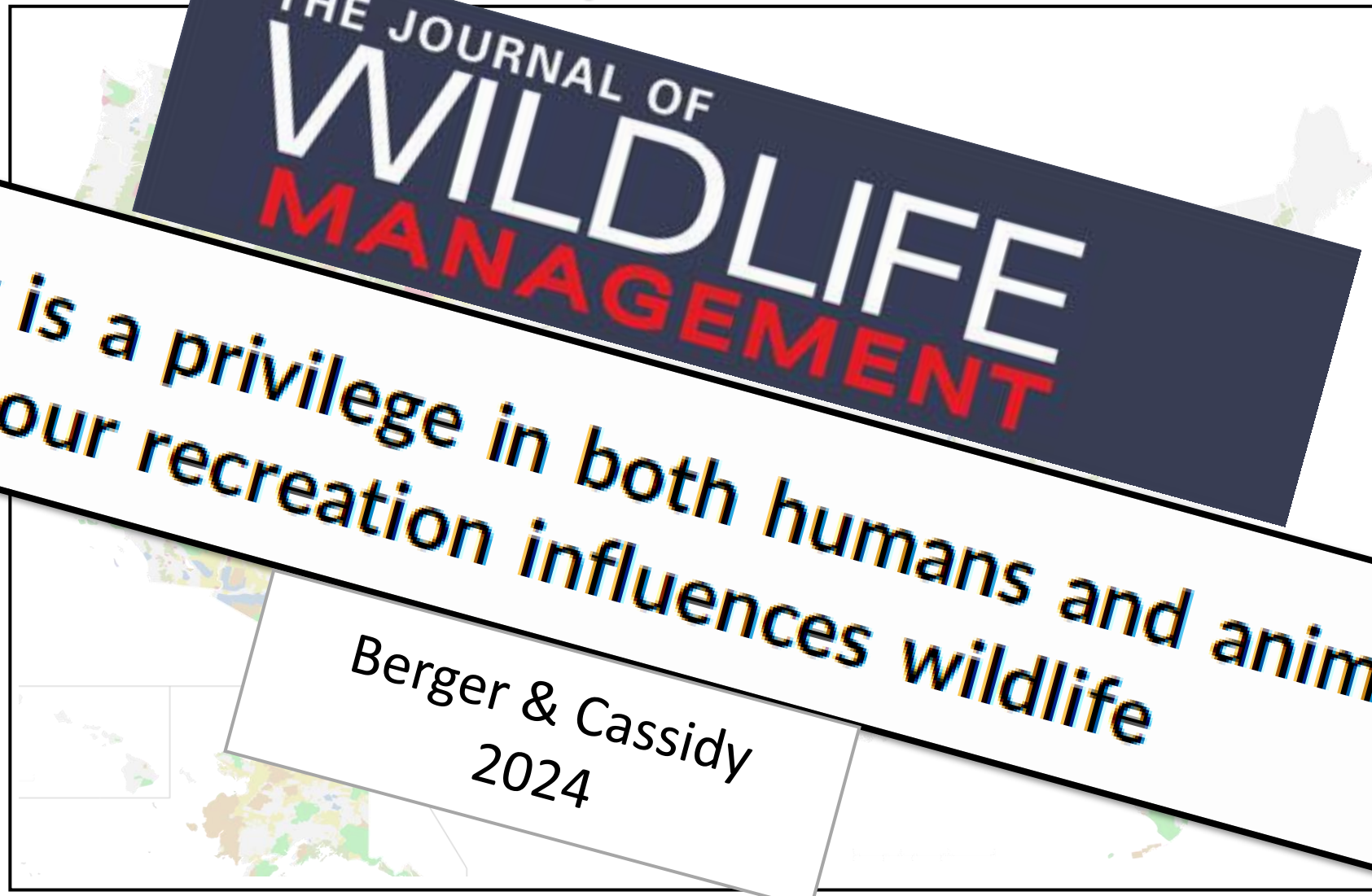
People Love to Play

Especially on Public Land



> Visitors to NPS lands than Σ ***Baseball, Basketball, Football***

Especially on Public Land



THE JOURNAL OF WILDLIFE MANAGEMENT

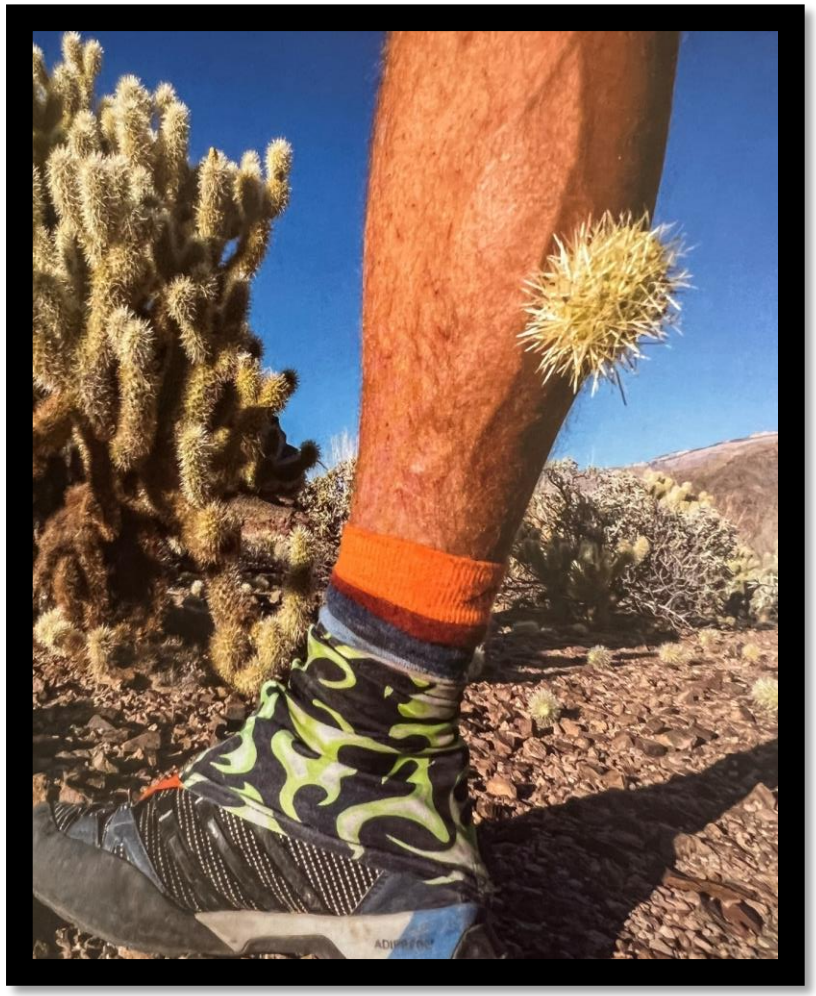
Play is a privilege in both humans and animals: how our recreation influences wildlife

Berger & Cassidy
2024

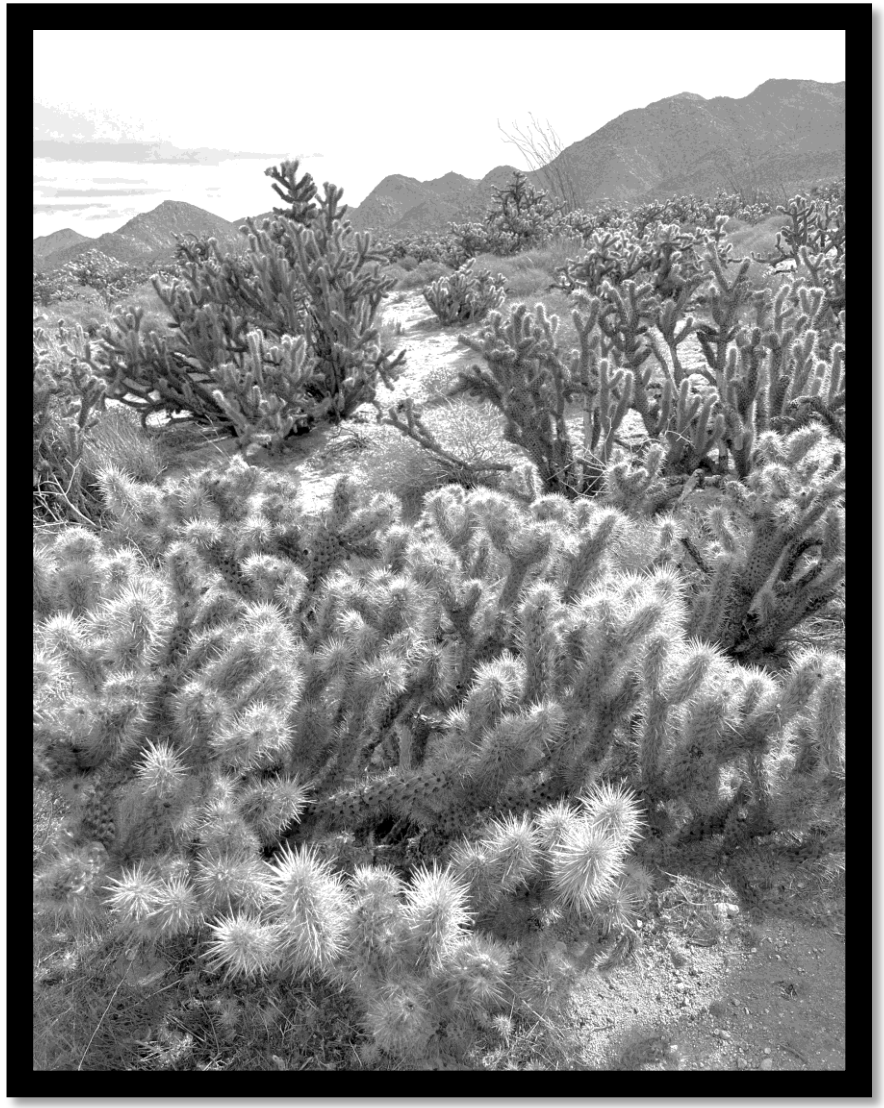
All of Us Play

but costs

and injuries



and injuries



Journal of Zoology | ZSL

The ecology, structure and functions of social play in Bighorn sheep (Ovis canadensis)

and $$$ for play

Steady but incremental Change

Photo credits – J. Berger, NGS

Play is controversial

Extreme mountain biker group fights wilderness access

A new law could change the nature of wilderness travel.

Carl Segerstrom

A mountain biker in the Boulder-White Clouds Mountains in Idaho, before the area was

Bighorns in News

BLM Will Study Impacts On Bighorn Sheep Further Before Making Helicopter Permit

April 4 2019

Naturalist Says Outdoor Recreation Can Have Huge Impacts On Wildlife

MOUNTAIN BIKERS AND HIKERS WITH DOGS CAN BRING HUGE SPATIAL INTRUSIONS INTO WILDLIFE HABITAT

MOUNTAIN JOURNAL

by Todd Wilkinson

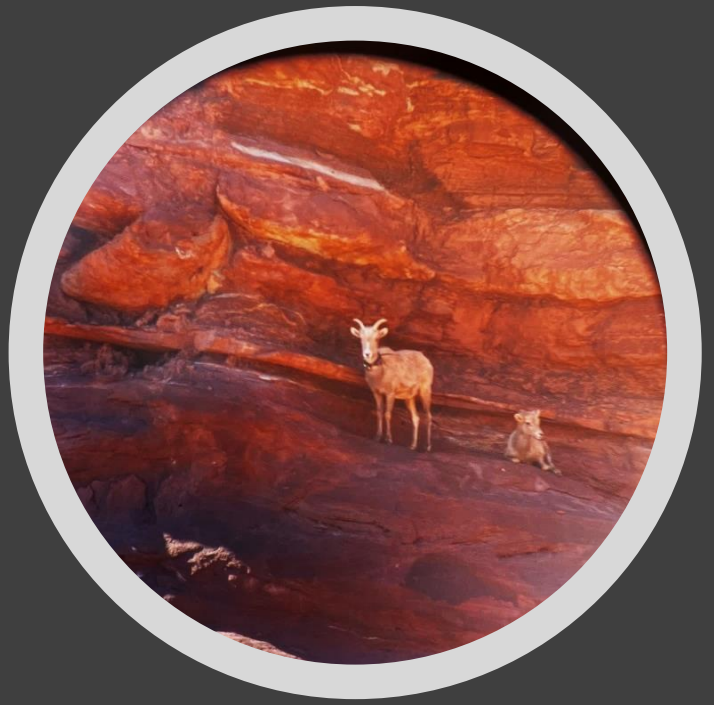
March 20 2019

Colorado State

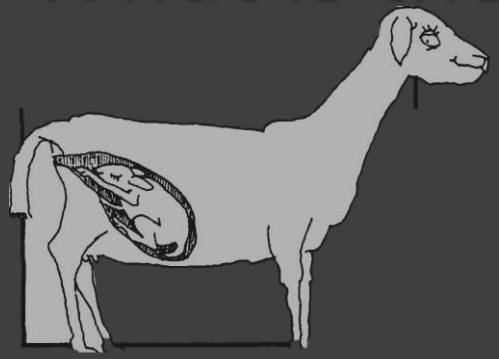
Last Six Years

Colorado State

The Focus – charting change & challenge:



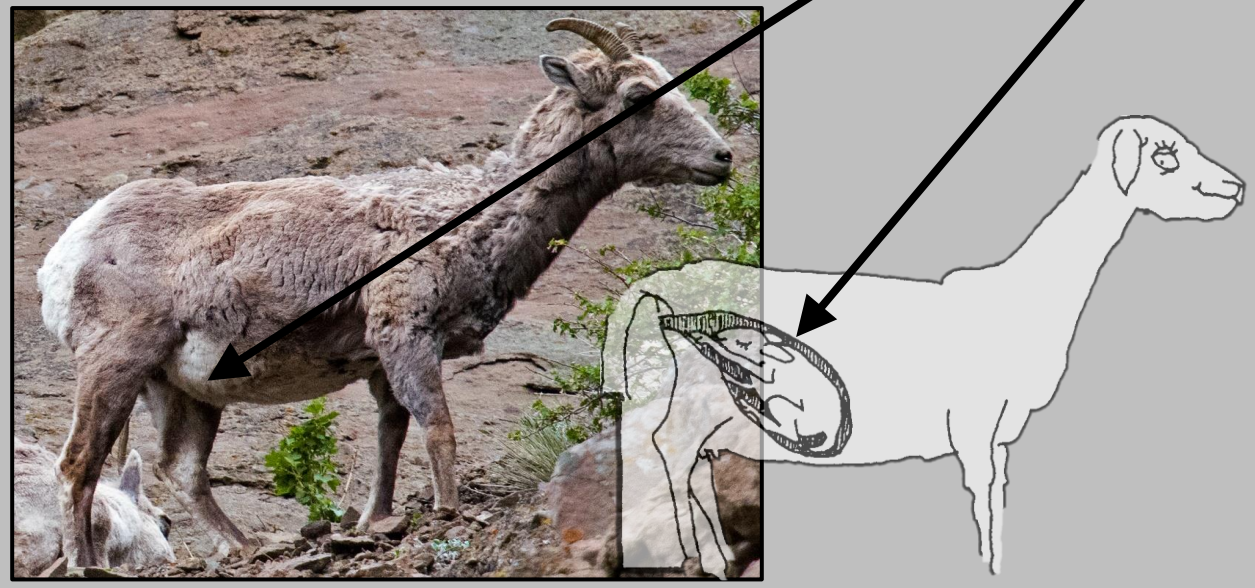
What is the most sensitive period?



Colorado State

Healthy Maternal Environment?

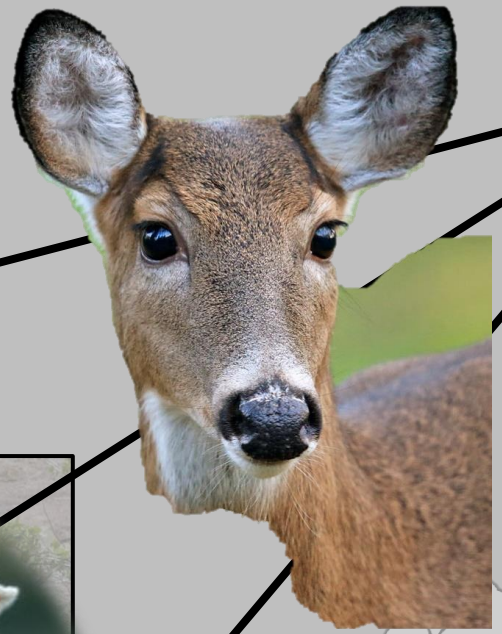
Last Trimester



Nutrition & Stress

- Birth Weight
- Fetal Growth
- Brain Development

EXTERNAL Environment?



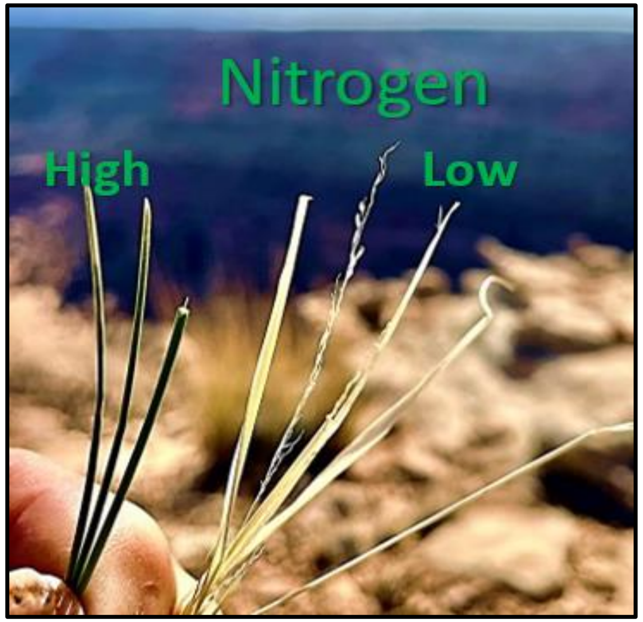
Last Trimester

Nutrition & Stress

- Birth Weight
- Fetal Growth
- Brain Development

Spring is Crazy

South Facing Slopes



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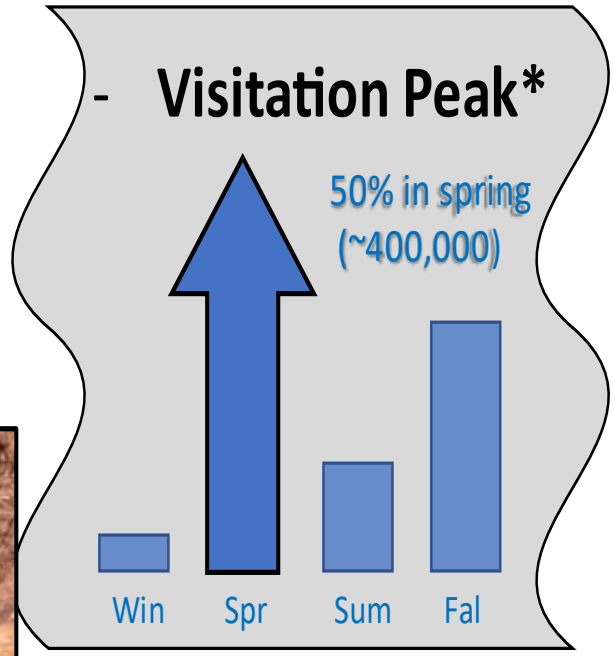
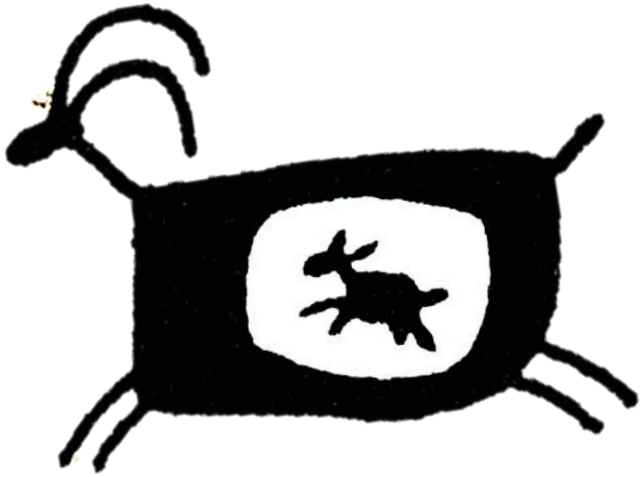
Spring is Crazy



Canyonlands, Arches, and Dead Horse Mesa all highly correlated



Colorado State

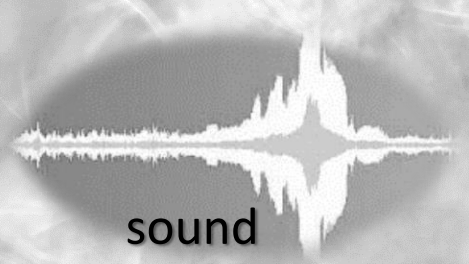
Complicated Milieu

Economy

Public Lands

Governance – Local, State, Federal

Large Unknowns



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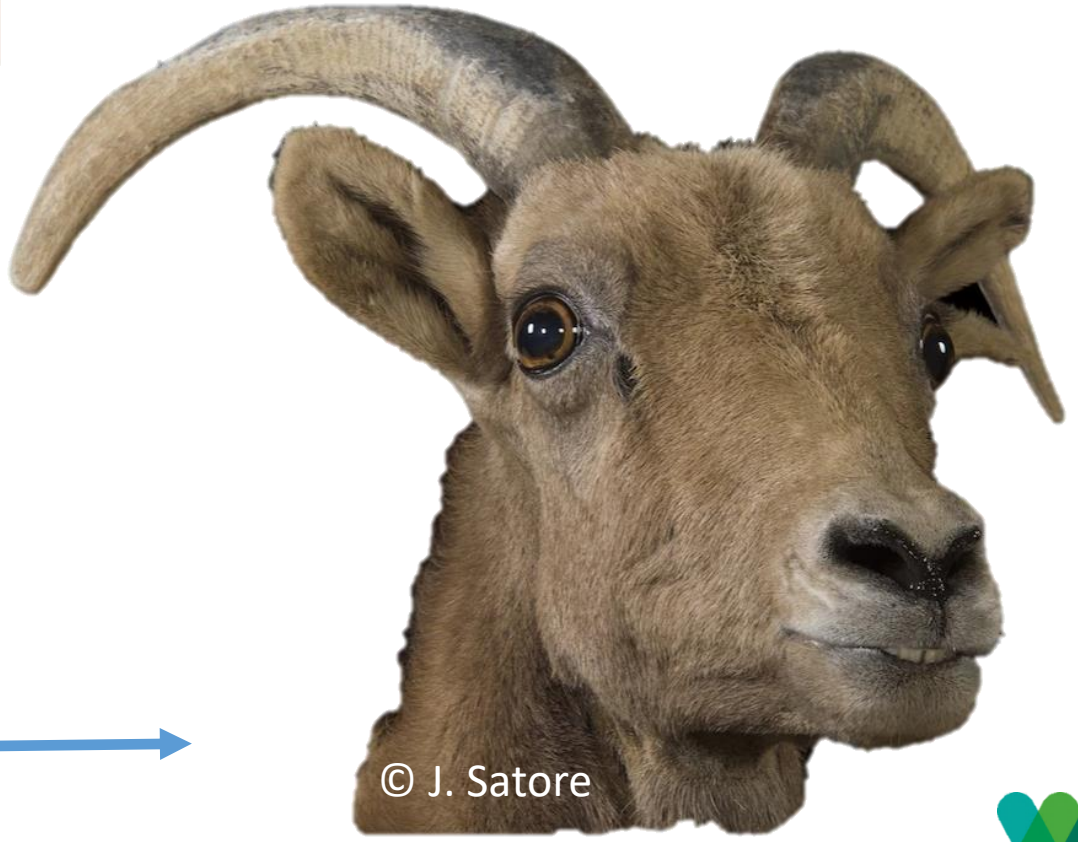
What are biological consequences of disturbance?

Colorado State

Big horns
Small horns



Most critical →

Colorado State

WCS

Food

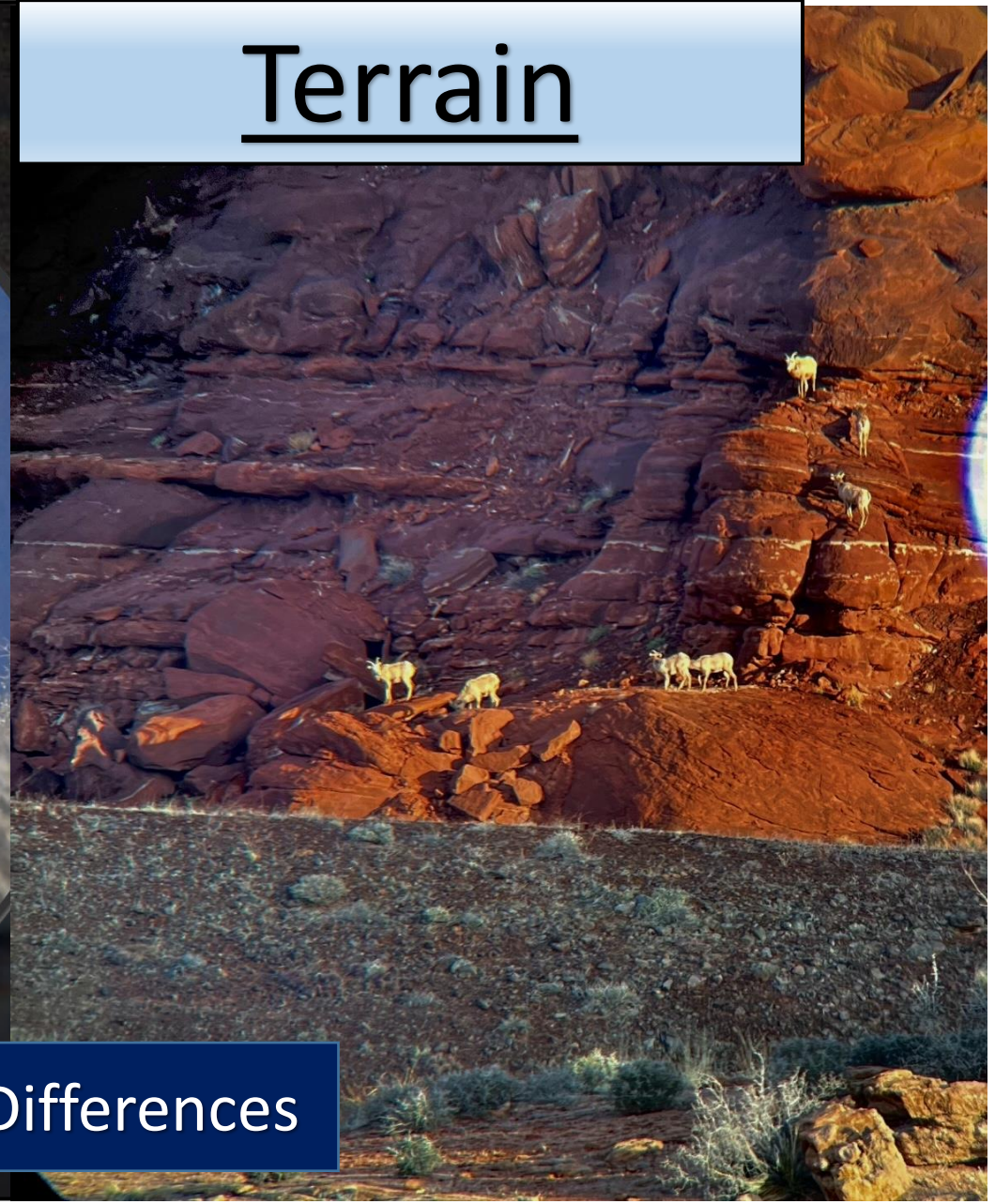
- Grass-forbs
- shrubs

Sex Differences

Colorado State

WCS

Terrain



Sex Differences

Colorado State

WCS

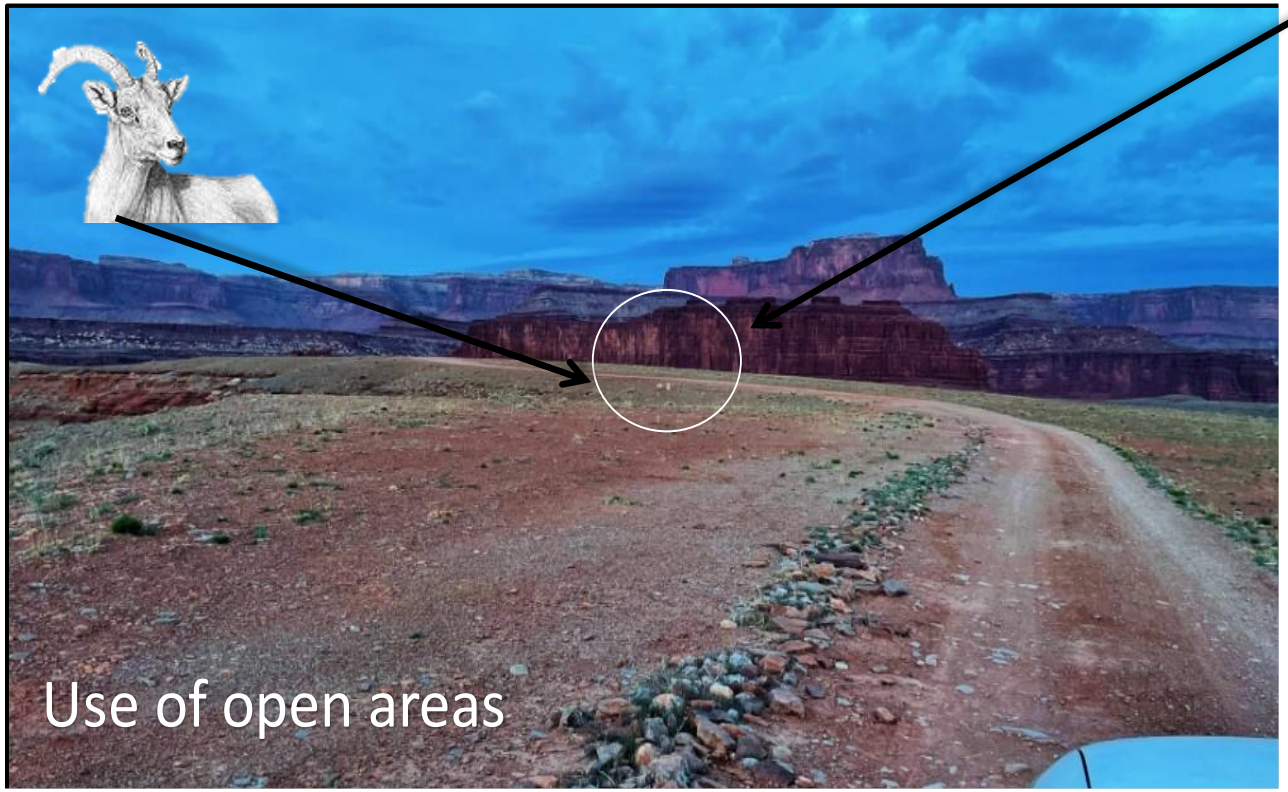
Risk-taking by females increases in spring

WCS

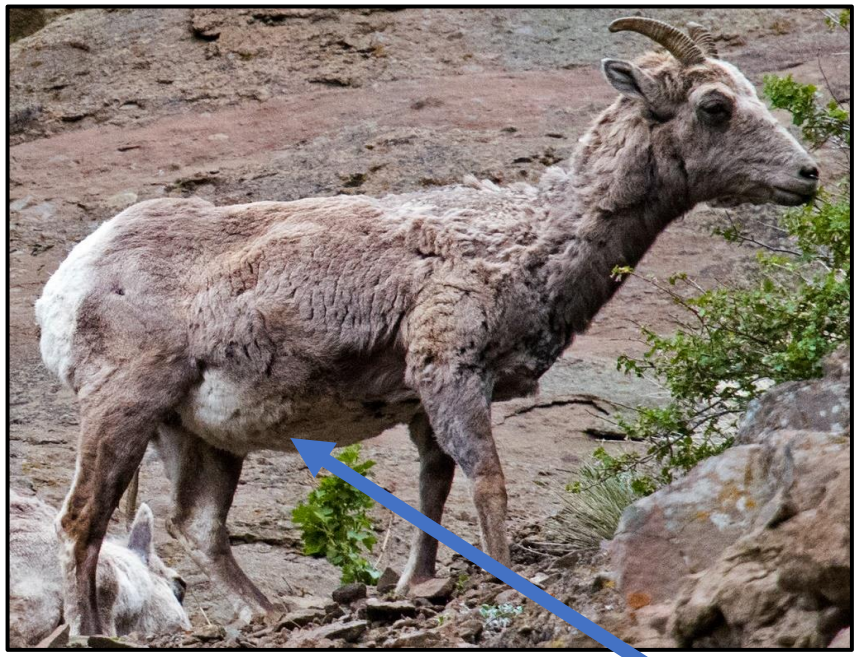
Complicated Mix

People



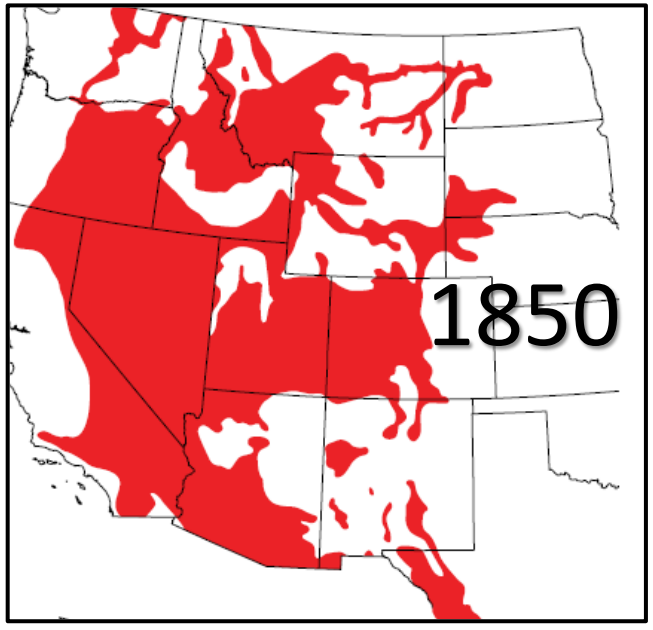
Biology



Most critical

Pre-Euro Settlement

© Mike McCue



WCS

< 95%

Loss

Colorado State

WCS

Utah

Volume 6, pp. 1-549, 91 figures in text, 30 tables
August 10, 1952

MAMMALS OF UTAH

Taxonomy and Distribution

BY

STEPHEN D. DURRANT

1952

UNIVERSITY OF KANSAS
LAWRENCE

Colorado State

Mammals of Utah

By CLAUDE T. BARNES

Member American Society of Mammalogists, Member Biological Society of Washington, Associate Member American Ornithologists' Union, Co-author "Western Natural Resources," "Forest Groves and Canyon Streams," Member of the American Association for the Advancement of Science, etc.

1925

Bulletin of the
UNIVERSITY OF UTAH
SALT LAKE CITY
UTAH

Inland Printing Company, Kaysville, Utah

than twenty inches apart. General color grayish ... paler about the head; a light patch under the lo... Legs like the body, with a narrow line of white on their posterior edges. Buttocks, for some inches anterior to the tail, and belly, white. Tail like the back. Female with smaller horns more like those of the goat. Hoofs black; horns yellowish brown. (Baird.) All desert specimens are much paler in color than those inhabiting well-watered, heavily forested regions. (Hornaday.)

Distribution—The general range of this species is from the high mountain ranges of the Colorado river north into British Columbia. Brigham Spencer of Moab reports that he has taken them on Escalante Creek, Garfield county, Utah, and on the Grand river in Grand county. Carl P. Arentson says there are 106 mountain sheep on the whole Uinta mountain range. Clinton Milne of St. George informs me that there are a few mountain sheep in the pink ledges of Little Zion canyon near Springdale, Washington county;

114 113 112 111

FIG. 88. Distribution of *Ovis canade*

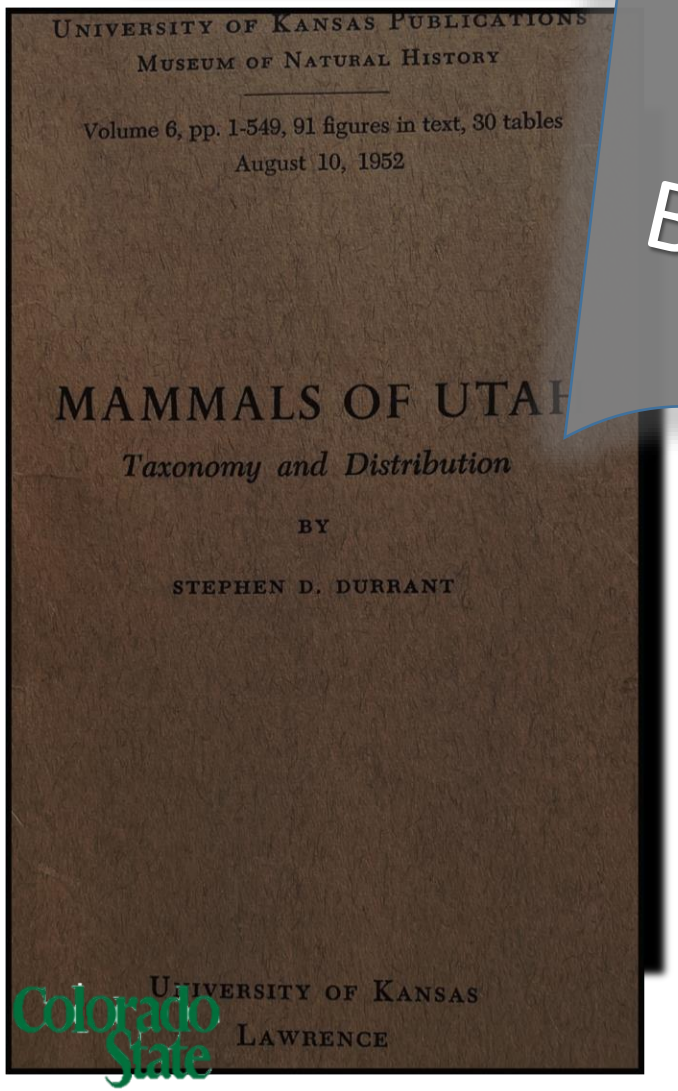
As early as 1874, Allen (1874:64) menti
in the numbers of mountain sheep. Bar
400 animals in the Uinta Mountains
made in 1949, regarding mountain sheep in Utah are

Map No. 7.—Range of Mountain Sheep (OVIS CERVINA Des.) in Utah. Based on records by Claude T. Barnes.

WCS

Utah

As early as 1874, Allen .. Mentioned the rapid decrease in the number … Barnes (1927:177 reported…



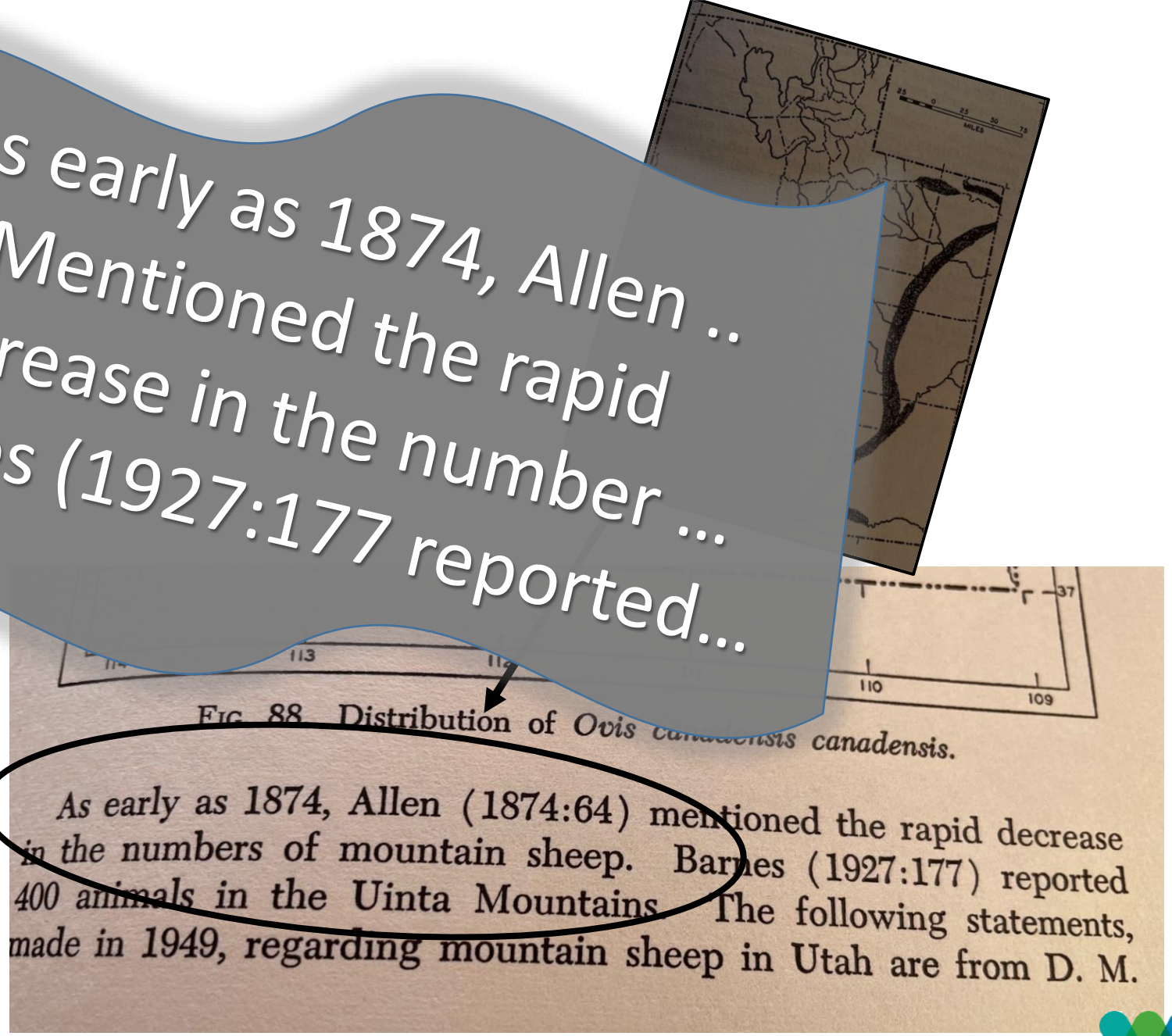


FIG. 88. Distribution of *Ovis canadensis canadensis*.

As early as 1874, Allen (1874:64) mentioned the rapid decrease in the numbers of mountain sheep. Barnes (1927:177) reported 400 animals in the Uinta Mountains. The following statements, made in 1949, regarding mountain sheep in Utah are from D. M.

Colorado State

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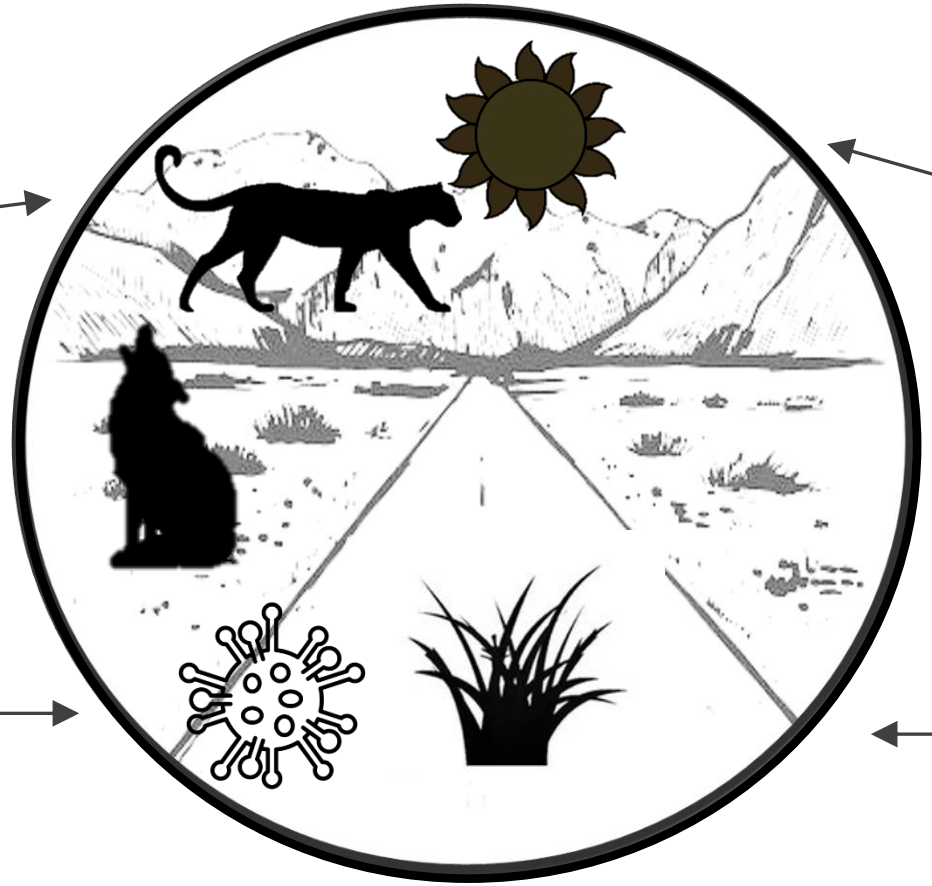
Restoration Efforts

Utah DNR – Wildlife

What Stressors?



Predation

Disease

Drought

Finding Food

Ecological

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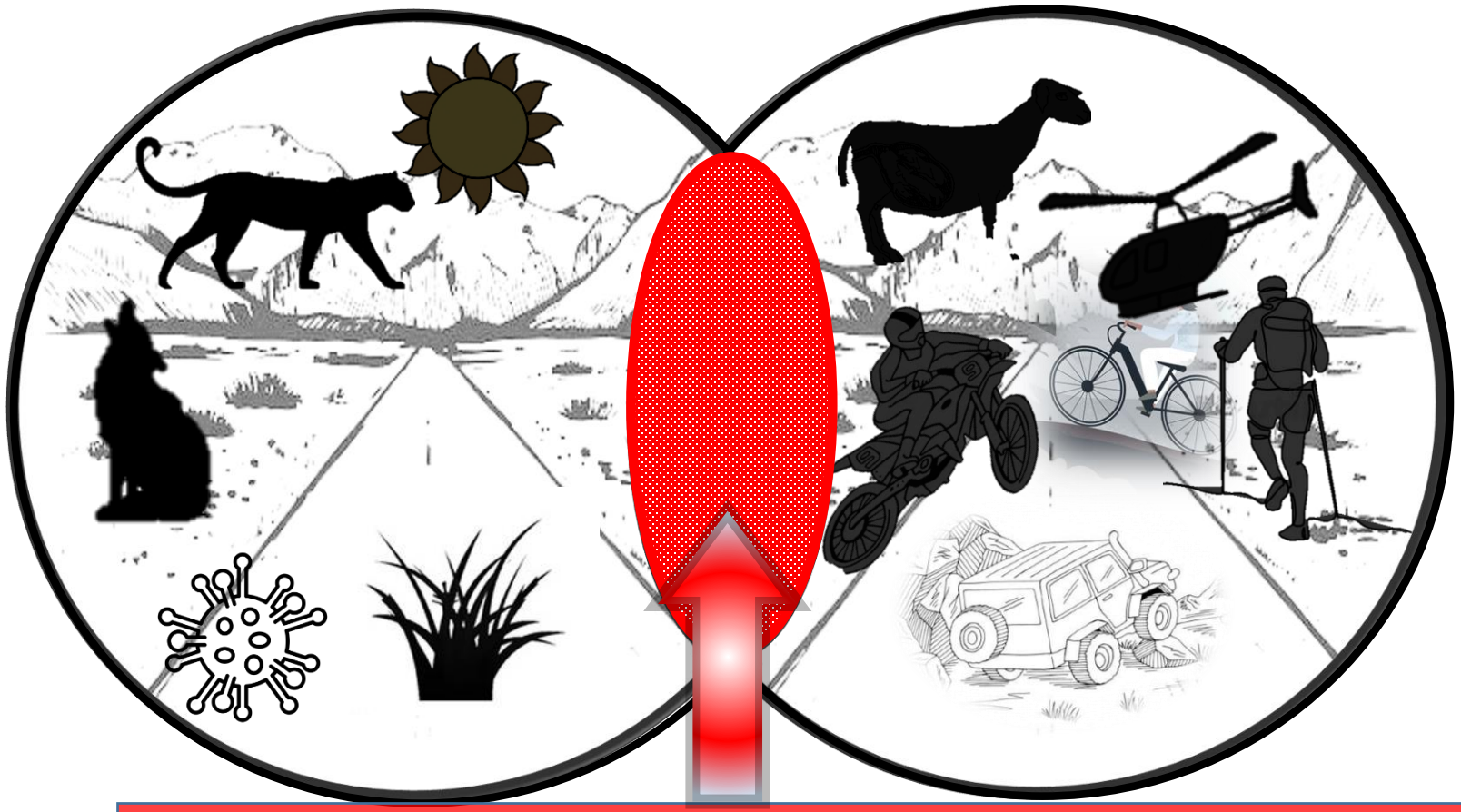
What Stressors?

Domestics added

Recreation

Introduced

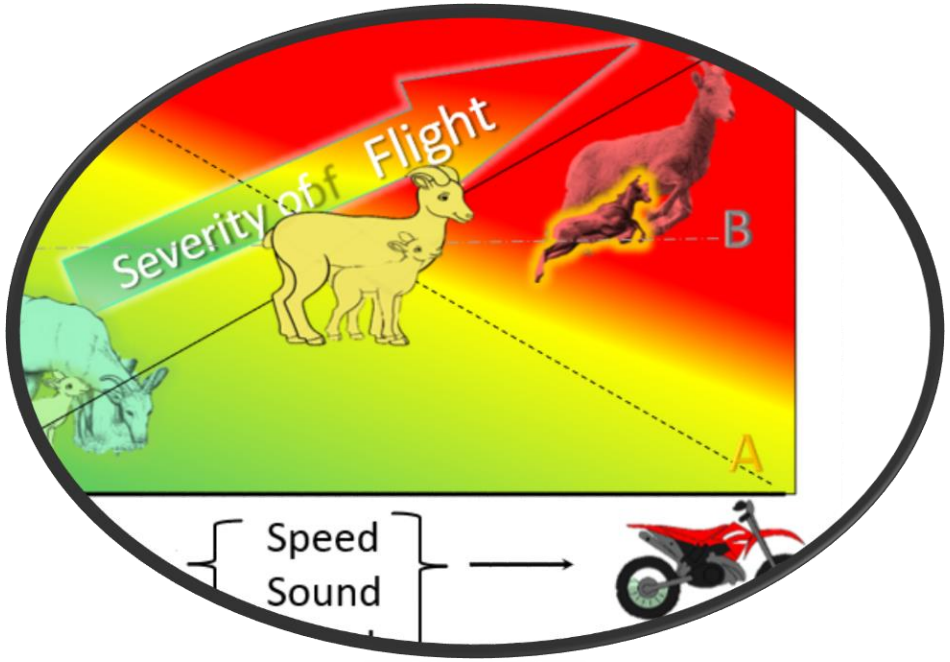
Cumulative

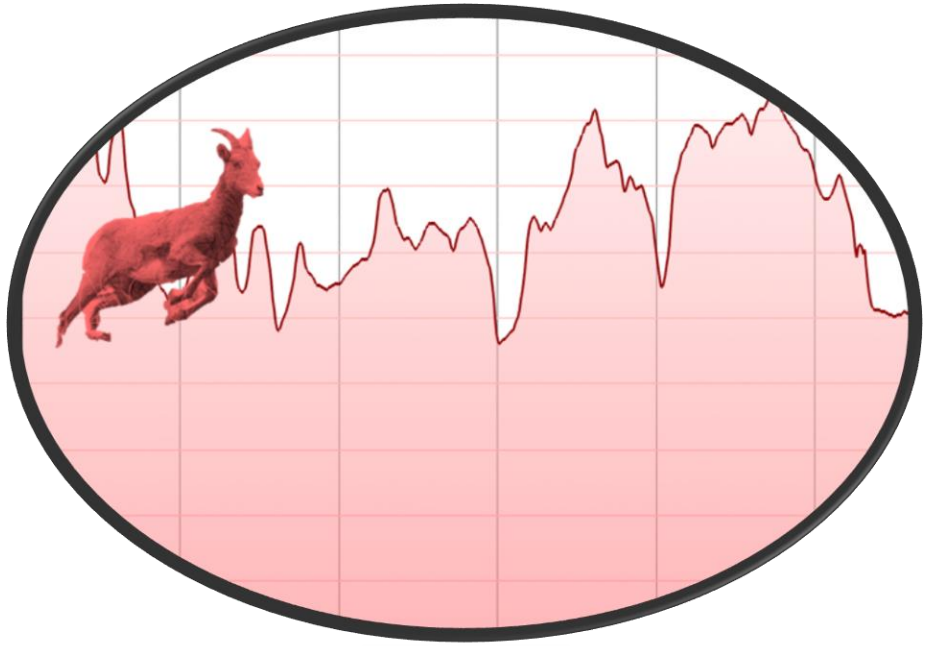


Biological Overload ?

What are we doing?

Understanding Bio-Energetics of Disturbance





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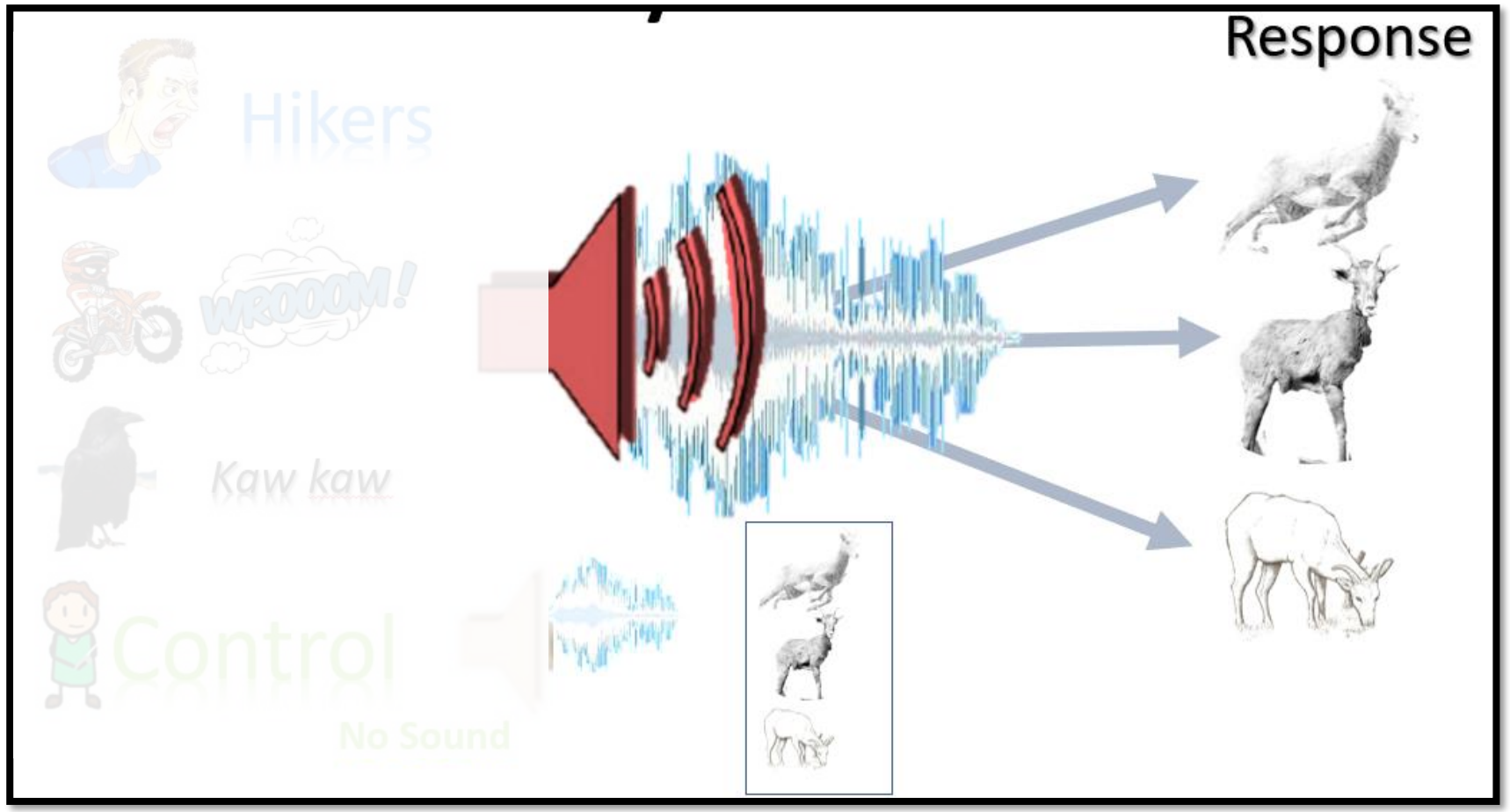
Manipulation of Visual & Acoustic Environments

Sound Playbacks through Speakers



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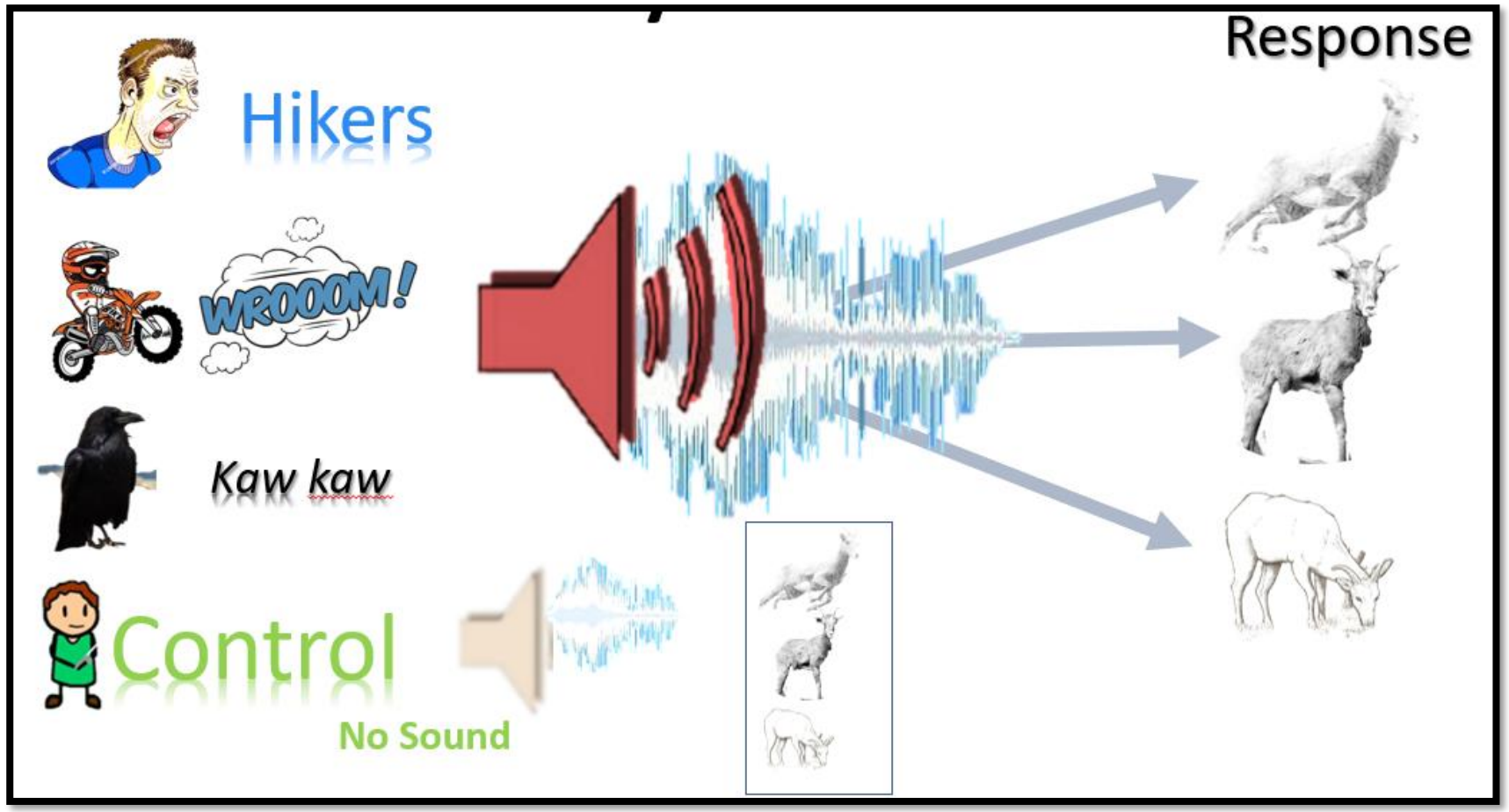
Manipulation of Visual & Acoustic Environments

Sound Playbacks through Speakers



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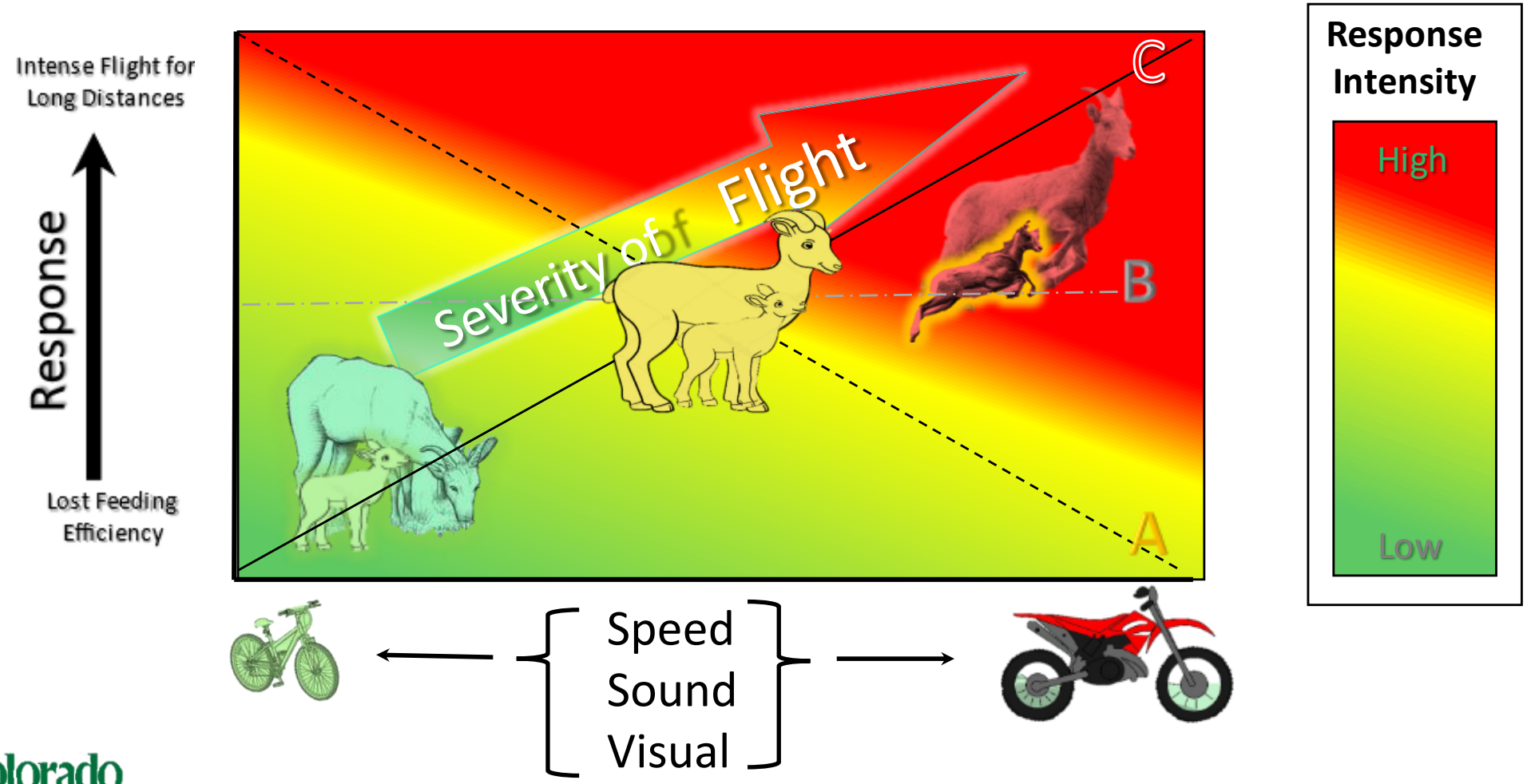
Manipulation of Visual & Acoustic Environments

Sound Playbacks through Speakers

Colorado State

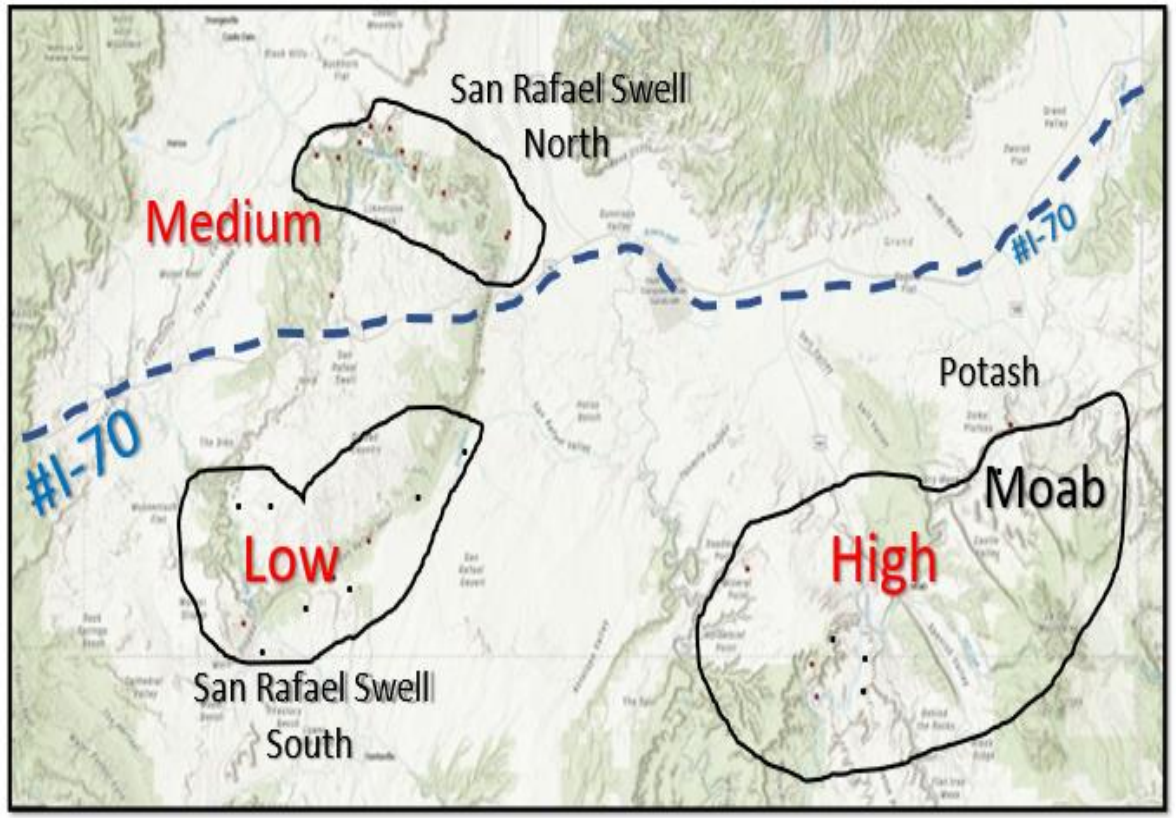
Manipulation of Visual & Acoustic Environments

Measure Responses



Gradient

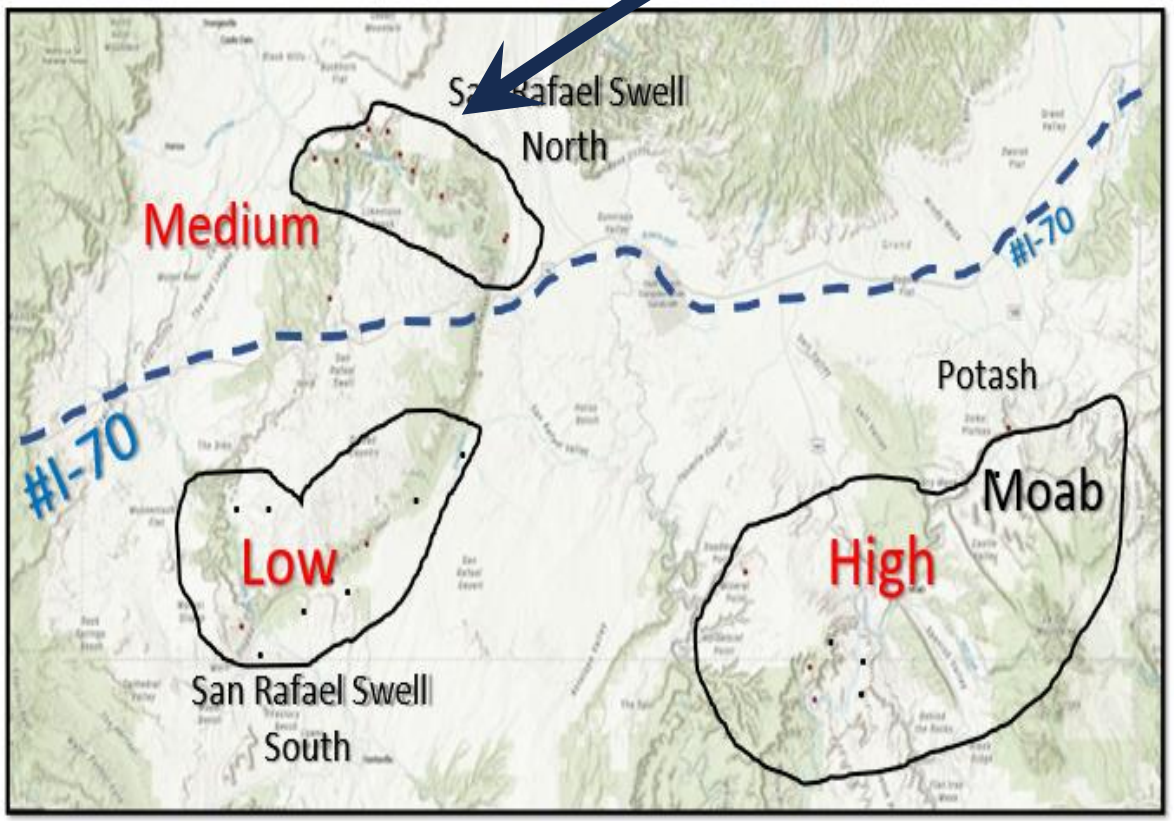
Study Areas



Colorado State

Gradient

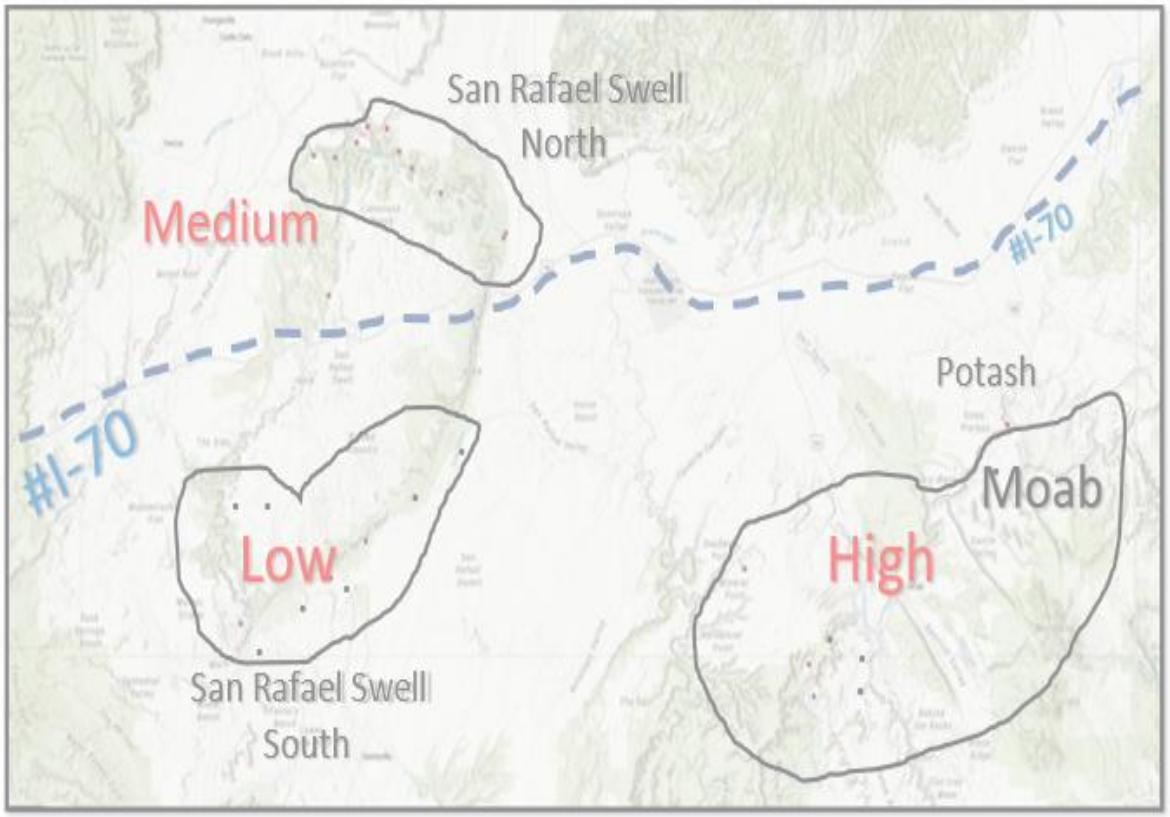
Study Areas



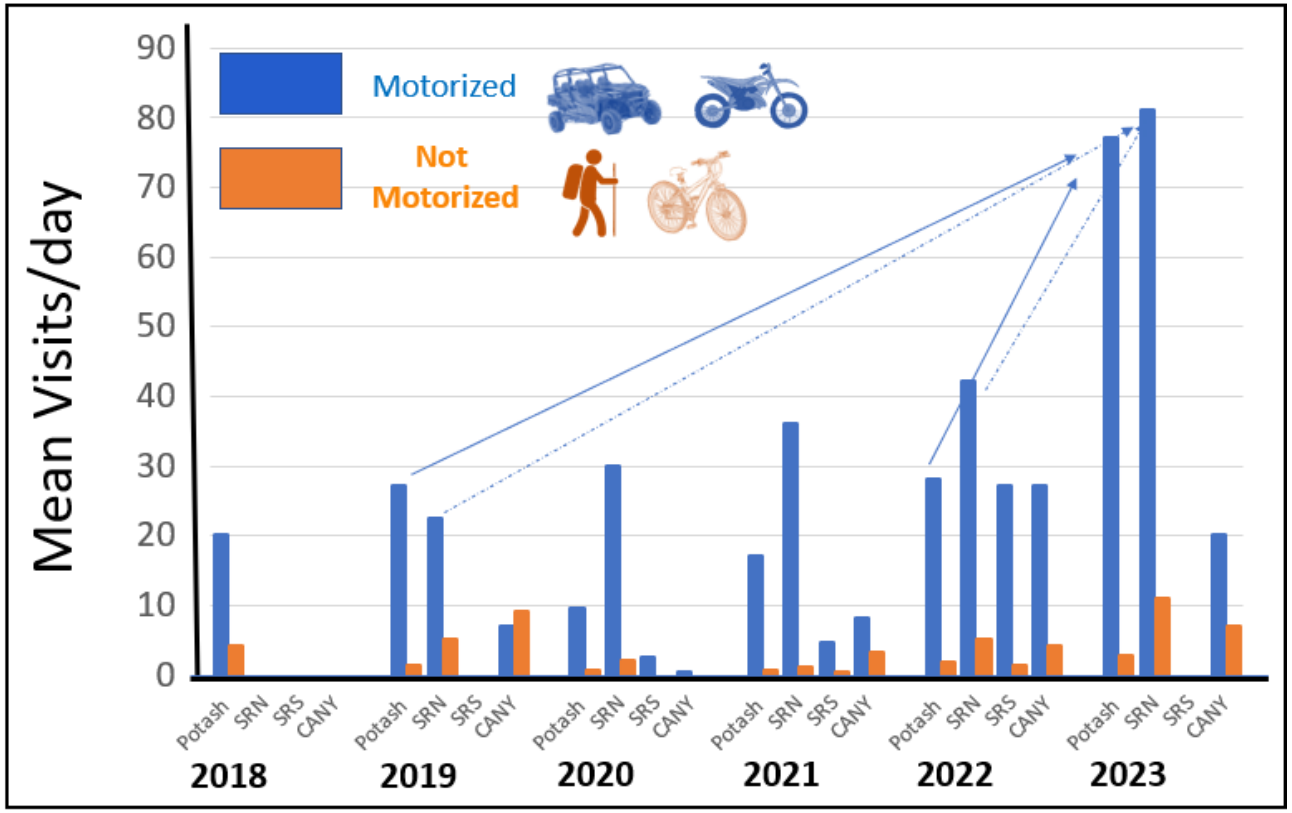
Northern S R Swell

Gradient & Changes over Time

Study Areas



Recreation Type by Year



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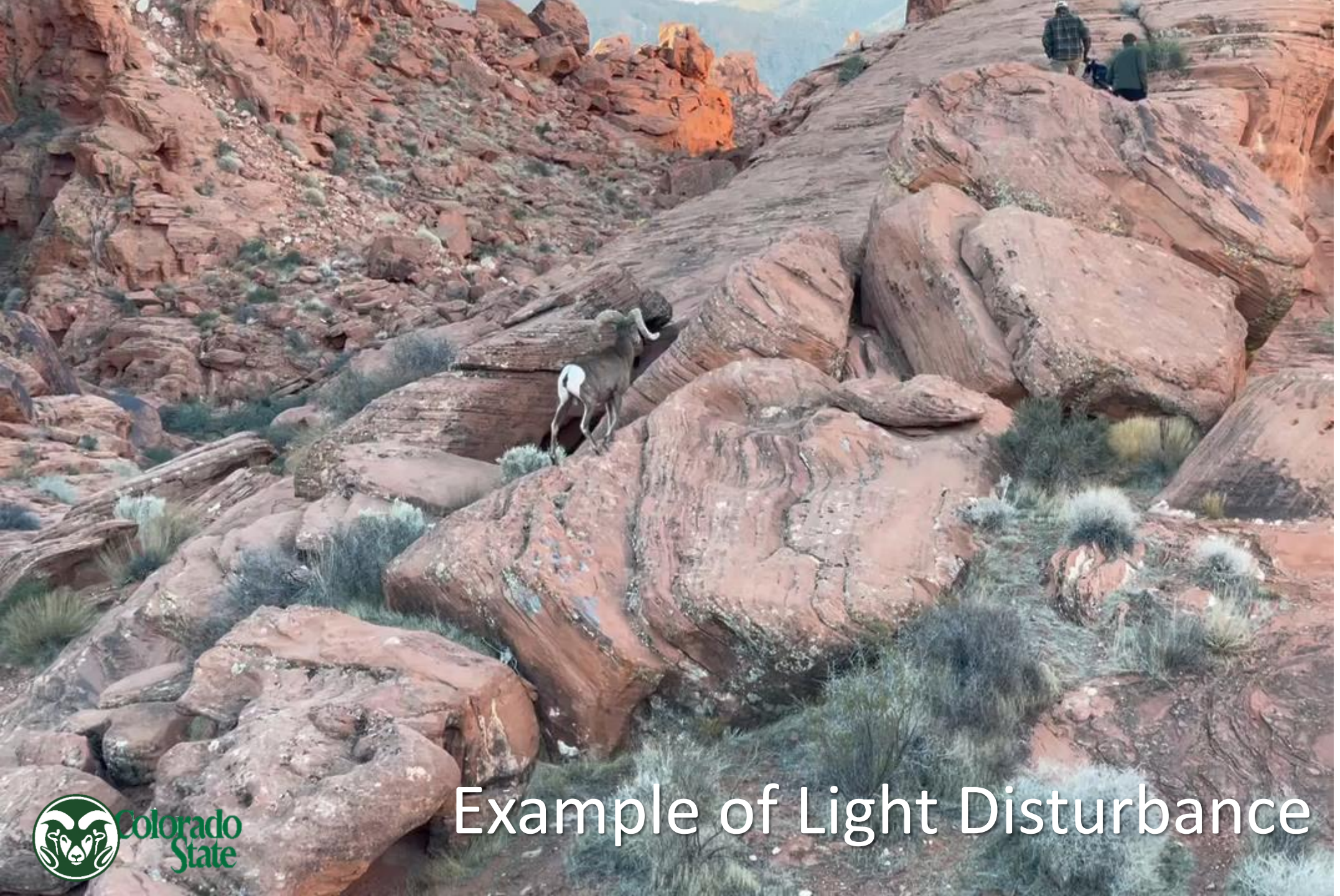
Field Data - Examples

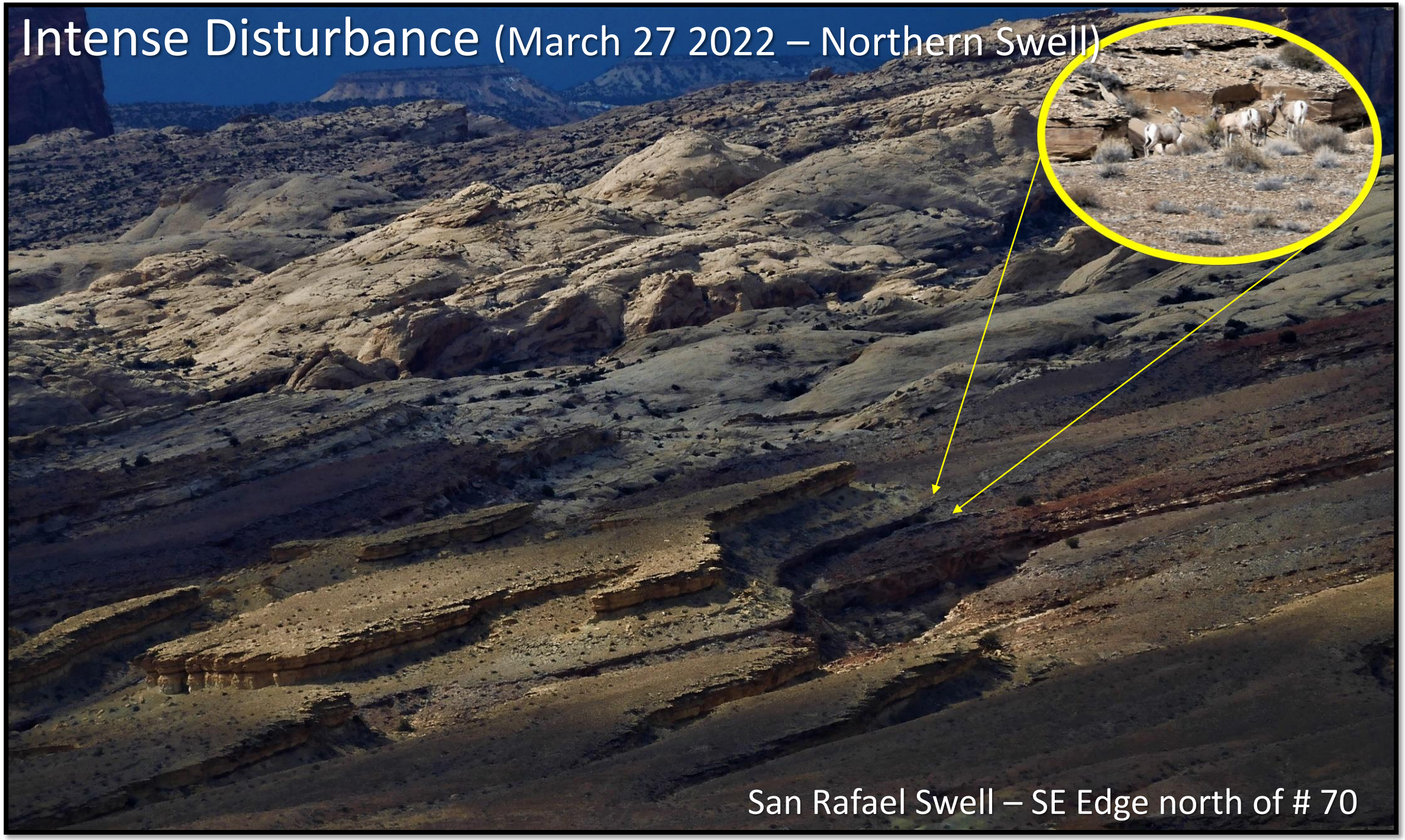
Example of Light Disturbance


Example of Light Disturbance



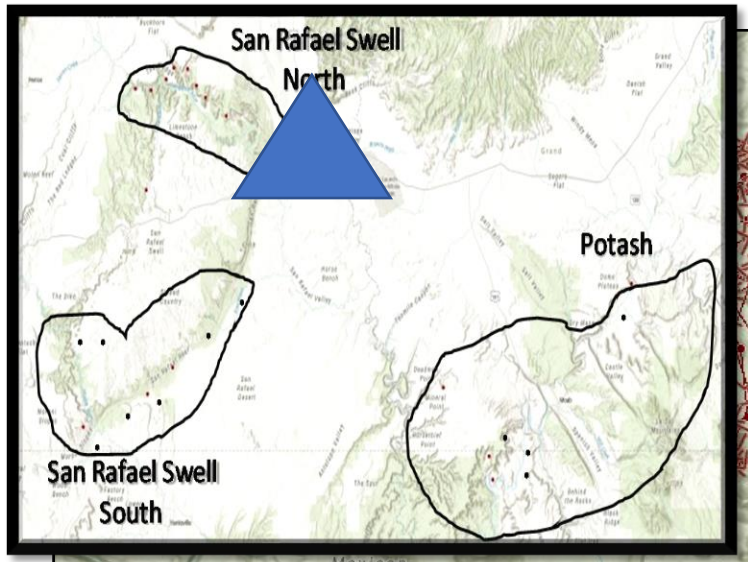
Example of Light Disturbance

Intense Disturbance (March 27 2022 – Northern Swell)



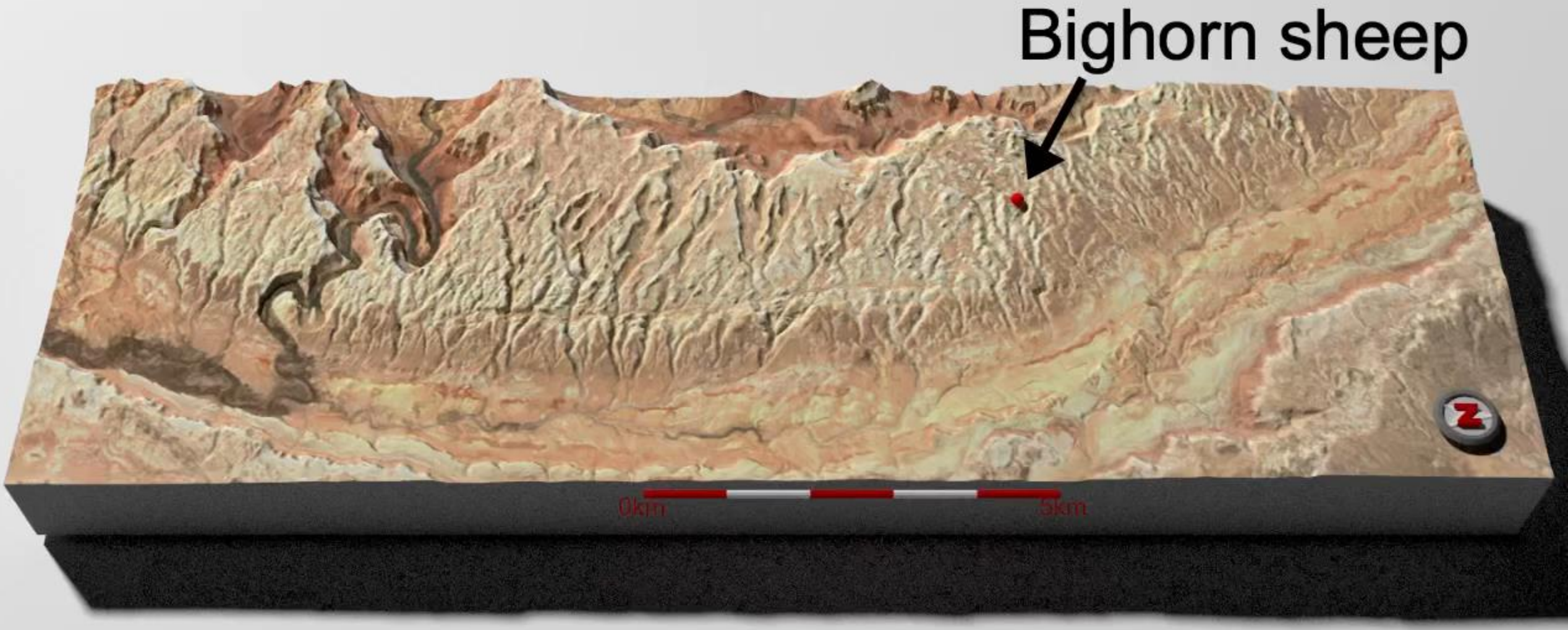
San Rafael Swell – SE Edge north of # 70

More Intense Disturbance from Two Jeeps (March 27 2022 – Northern Swell)



Colorado State

March 27, 2020 04AM



Colorado State

Graph: Min, Avg, Max Elevation: 4624, 5051, 5377 ft

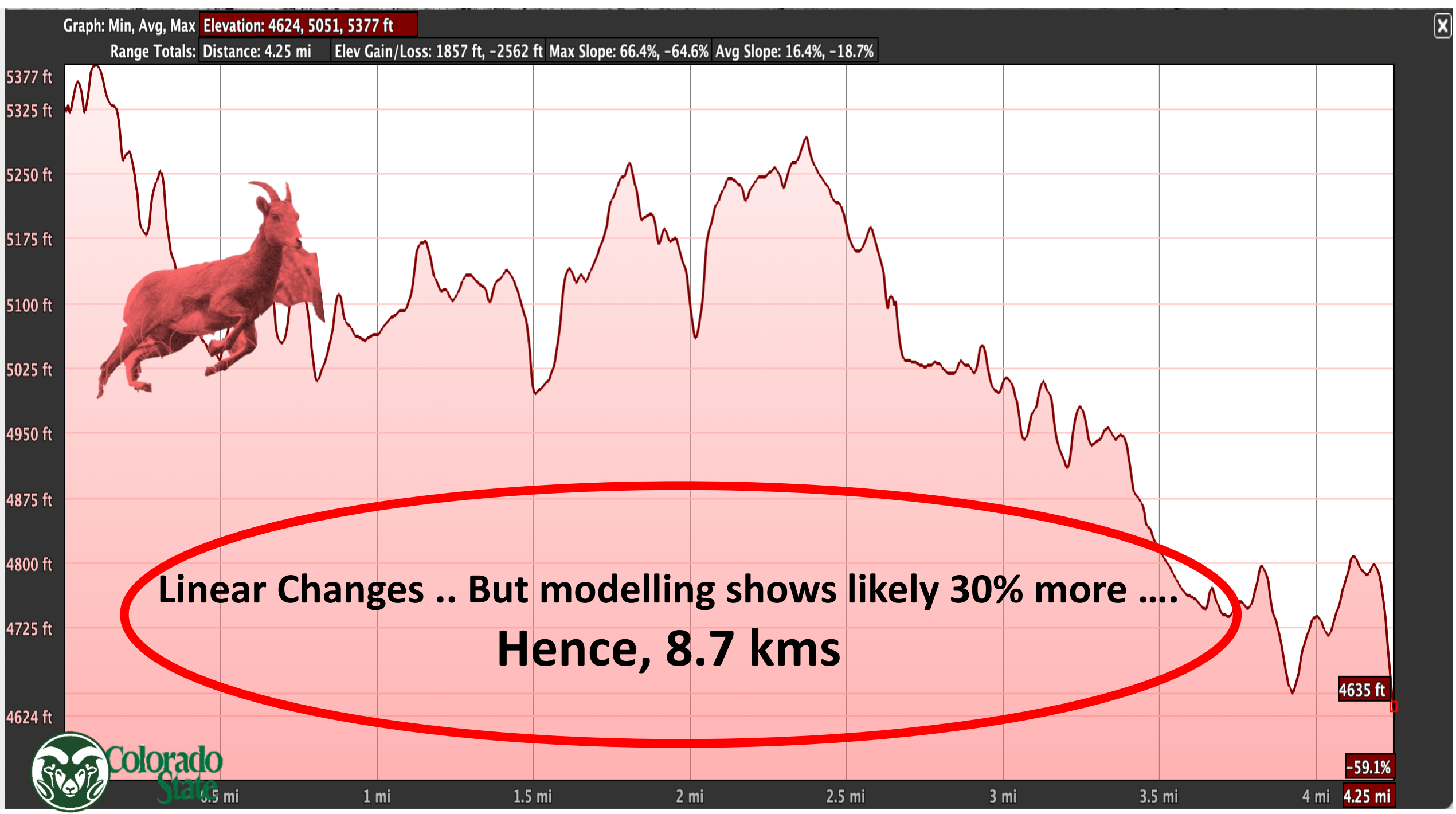
Range Totals: Distance: 4.25 mi | Elev Gain/Loss: 1857 ft, -2562 ft | Max Slope: 66.4%, -64.6% | Avg Slope: 16.4%, -18.7%

Elevational change by distance in path of retreat.

Max – slope = 66.4%

Elevation Gain/Loss 1857 to 2562 ft

Colorado State


Graph: Min, Avg, Max
Elevation: 4624, 5051, 5377 ft
Range Totals:
Distance: 4.25 mi
Elev Gain/Loss: 1857 ft, -2562 ft
Max Slope: 66.4%, -64.6%
Avg Slope: 16.4%, -18.7%
5377 ft
5325 ft
5250 ft
5175 ft
5100 ft
5025 ft
4950 ft
4875 ft
4800 ft
4725 ft
4624 ft
Linear Changes .. But modelling shows likely 30% more ....
Hence, 8.7 kms
4635 ft
-59.1%
1 mi
1.5 mi
2 mi
2.5 mi
3 mi
3.5 mi
4 mi
4.25 mi
Colorado State


More Intense
(April 4 2023)


More Intense
(April 4 2023)


More Intense

1985 Imagery Date: 8/11/2019 lat 39.120094° lon -110.678499° elev 6386 ft eye alt 17022 ft

Graph: Min, Avg, Max Elevation: 5282, 5860, 6447 ft

Range Totals: Distance: 3.85 mi Elev Gain/Loss: 4230 ft, -3631 ft Max Slope: 90.6%, -91.4% Avg Slope: 34.0%, -34.1%

6447 ft
6250 ft
6000 ft
5750 ft
5598 ft
5500 ft
5282 ft
53.2%

6.2 kms
1200’ descent, 1000’ gain
Slopes <90%

0 ft 0.75 mi 1.5 mi 2.25 mi 3 mi 3.85 mi

Last Trimester

Consequence:

- ❑ Site abandonment
- ❑ > 3 weeks

Different but similar

March 29, 2023 – Potash

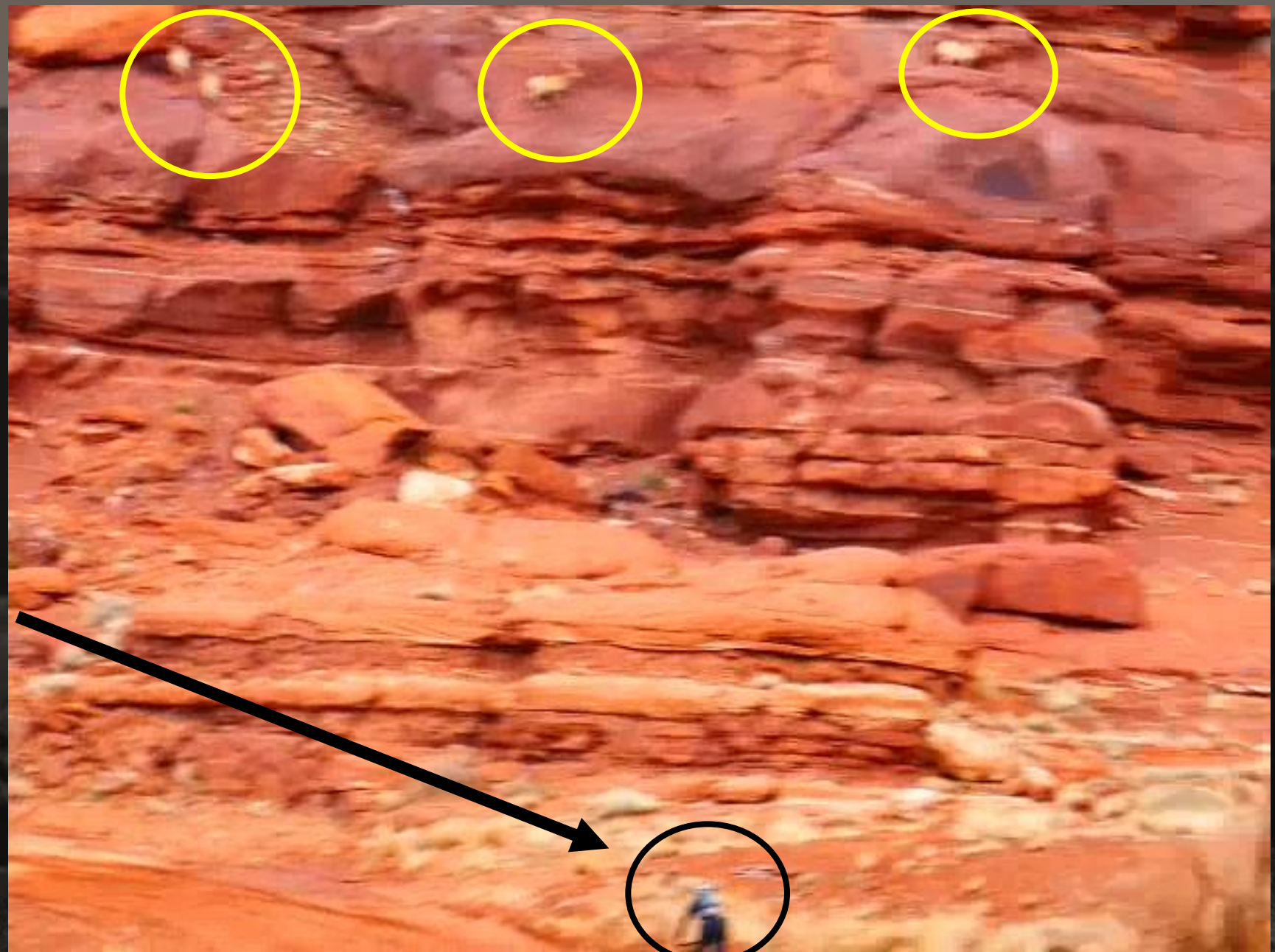
Different but similar

March 29, 2023 – Potash

Different but similar March 29, 2023 – Potash

Different but similar March 29, 2023 – Potash

Different but similar March 29, 2023 – Potash



Total Elapsed Distance >5 kms (3.1 miles))

Helicopters


Helicopters
Females

Helicopte


A Real Disturbance
The Initial Preview
DZTV
DENVER ZOO


River Corridor


Clumping but Nowhere to Go


Clumping but Nowhere to Go


Clustered for Safety


Stuck


San Juan River
DZTV


Disappeared
>2 miles

Masking/Amplifying of Sounds

Road Sinuosity *(Curves & Straight Sections)*

Masking/Amplifying of Sounds

Road Sinuosity *(Curves & Straight Sections)*

Masking/Amplifying of Sounds

t Sections)

Some Certainties & Uncertainties

Context and Exposure

Summing Up - A Fey Key Points

Not ‘just’ disappear over the ridge

Erratic Long Flights

- Enhance knowledge if we infer causal agents (pumas, people, etc)

Not ‘just’ disappear over the ridge

Erratic Long Flights

- Enhance knowledge if we infer causal agents (pumas, people, etc)
- **Multiple disturbances often amplify long flights**

Not ‘just’ disappear over the ridge

Erratic Long Flights

- ❑ Enhance knowledge if we infer causal agents (pumas, people, etc)
- ❑ Multiple disturbances often amplify long flights
- ❑ **Some may just be random walks**

Not ‘just’ disappear over the ridge

Erratic Long Flights

- Enhance knowledge if we infer causal agents (pumas, people, etc)
- Multiple disturbances often amplify long flights
- Some may just be random walks

Context matters

PBS NATURE

Privileged Play and Anxious Mothers

January 10, 2025 | Joel Berger

PBS

NATURE

Privileged Play and Anxious Mothers

January 10, 2025 | Joel Berger

- **We all share space & must recognize sensitive periods**

PBS NATURE

Privileged Play and Anxious Mothers

January 10, 2025 | Joel Berger

- ❑ We all share space & must recognize sensitive periods
- ❑ **Not pushing for final photo**

PBS NATURE

Privileged Play and Anxious Mothers

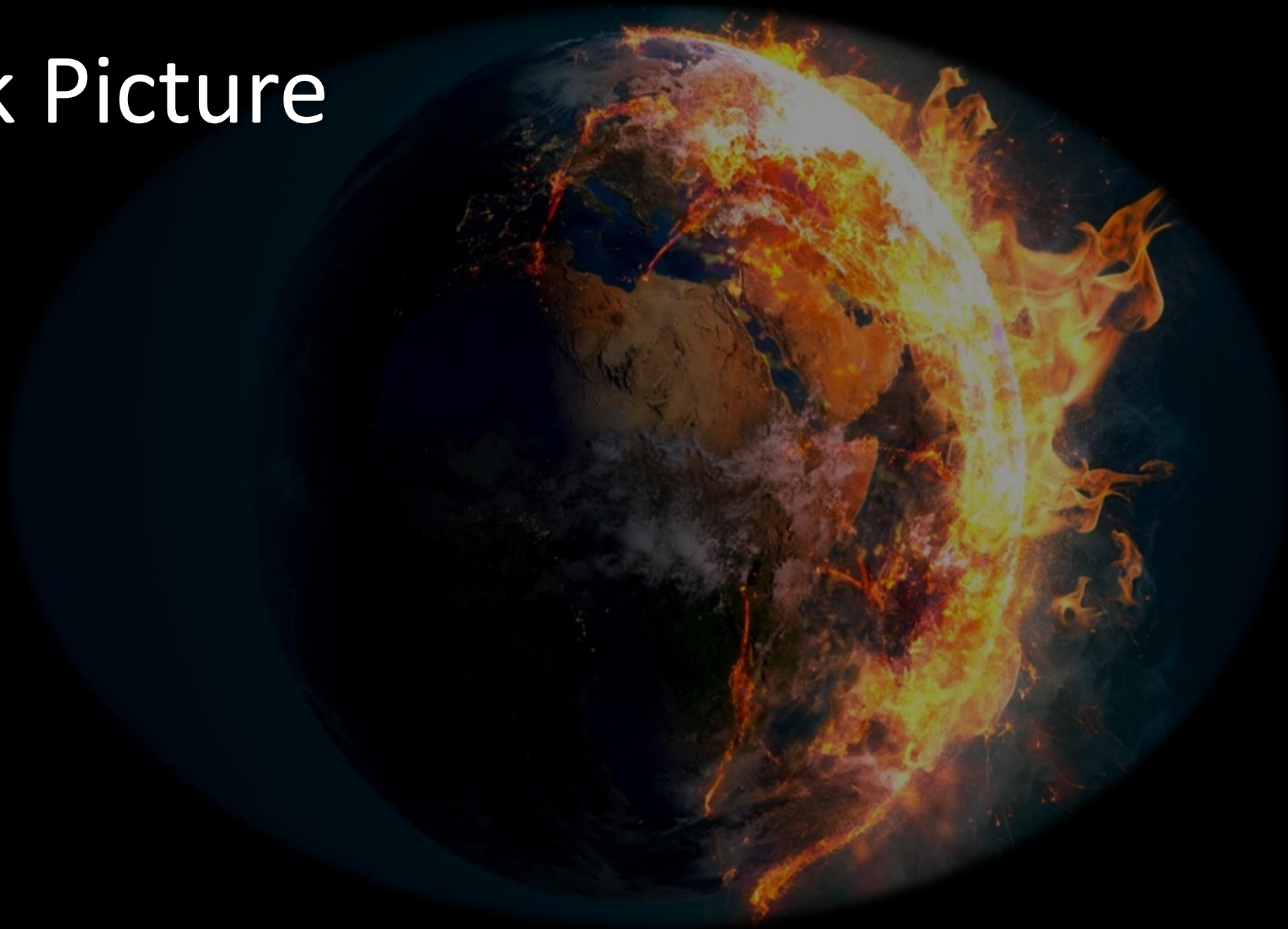
January 10, 2025 | Joel Berger

- ❑ We all share space & must recognize sensitive periods
- ❑ Not pushing for final photo
- ❑ **Temporary Restrictions** (generally well understood)
  - ❑ Nesting raptors, or wintering waterfowl
  - ❑ Den sites (carnivores)
  - ❑ Spawning sites

Wildlife in a Challenged World

LaVone Sterline

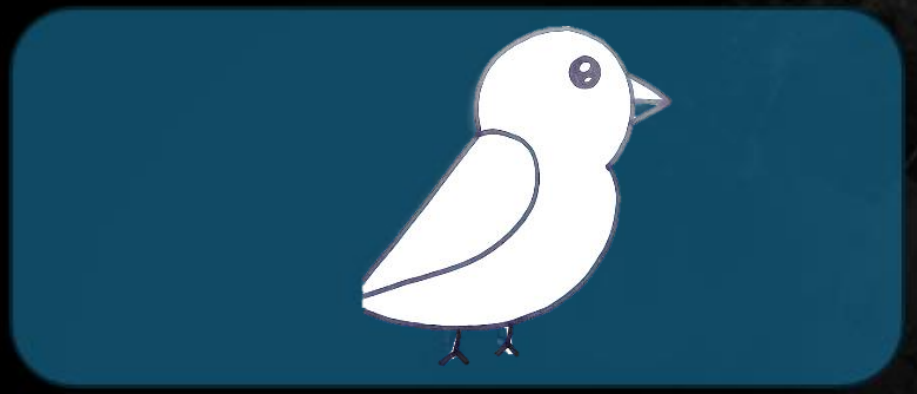
Dark Picture



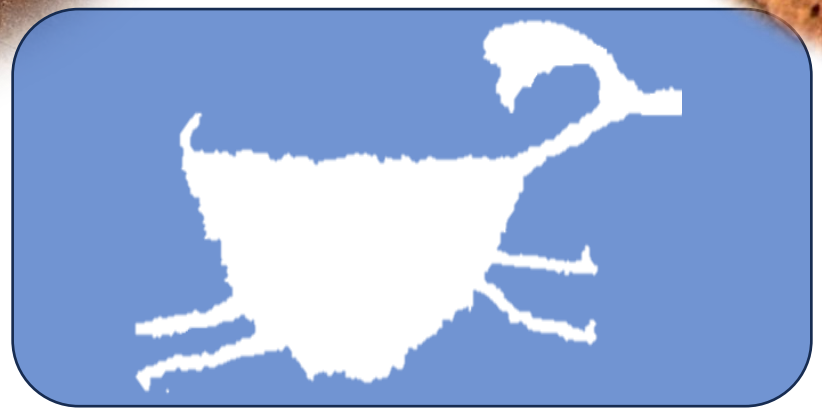
Can’t we turn some of this around

The why not question

Many Success – Pride



National Petroglyph?



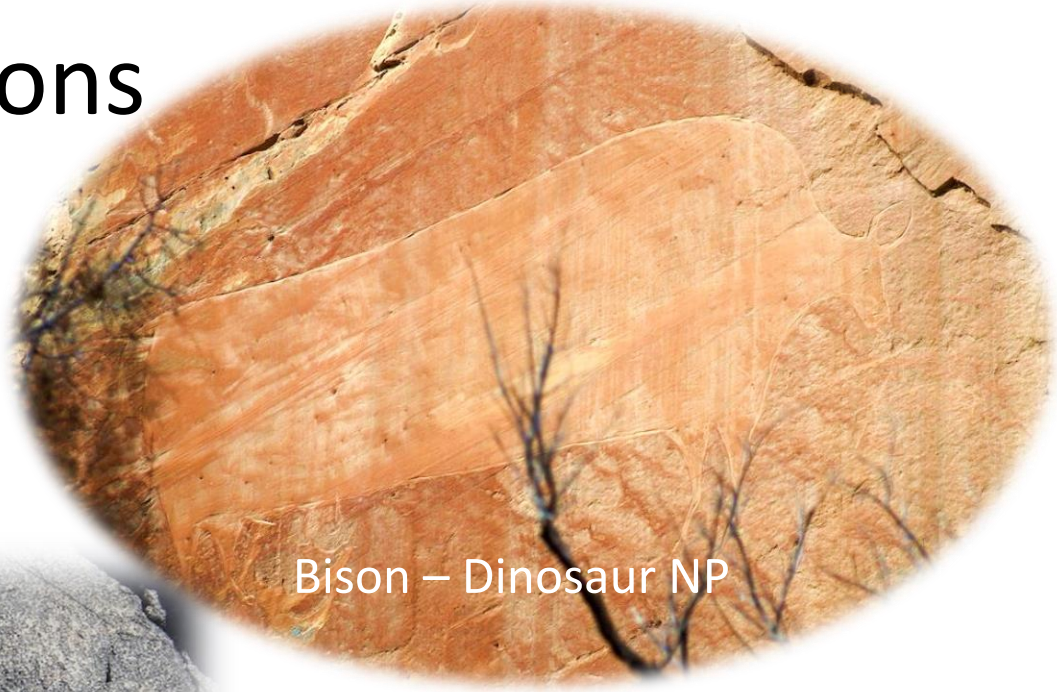
Bio-cultural Relevance

Colorado State

Why Not?

Many Options

Arches NP



Bison – Dinosaur NP

Sea Turtle – Hawaii Volcanoes

Colorado State

Images – National Park Traveler – K. Repanske

Massive Thanks to:

- Agencies *(federal, state, local),*
- NGO's,
- Business community,
- Interested people

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NATIONAL PARK SERVICE

WCS

UTAH DNR
50TH ANNIVERSARY
EST 1967
NATURAL RESOURCES

CANYONLANDS
Natural History Association
We Support the Lands You Love

COLORADO CANYONS ASSOCIATION
FOSTERING COMMUNITY STEWARDSHIP OF OUR NATIONAL CONSERVATION LANDS

Marc Coles-Ritchie

Wade Paskett

Bill Sloan

Pam Riddle

Questions

Colorado State