

LTPBR WORKSHOP



RANCHERS AND SCIENTISTS HELPING RODENTS MITIGATE DROUGHT

The Story Of Bringing Beaver Back To Birch Creek (Idaho)

Jay Wilde



BIRCH CREEK STORY ROAD MAP

1. Jay & the Birch Creek Watershed History
2. The hydrology problem
3. The evolution of grazing practices
4. Some hydrology experiments
5. What about beaver?
6. The BDA-assisted beaver restoration experiment





The Birch Creek Watershed



© 2017 Google
Image Landsat / Copernicus

Google Earth

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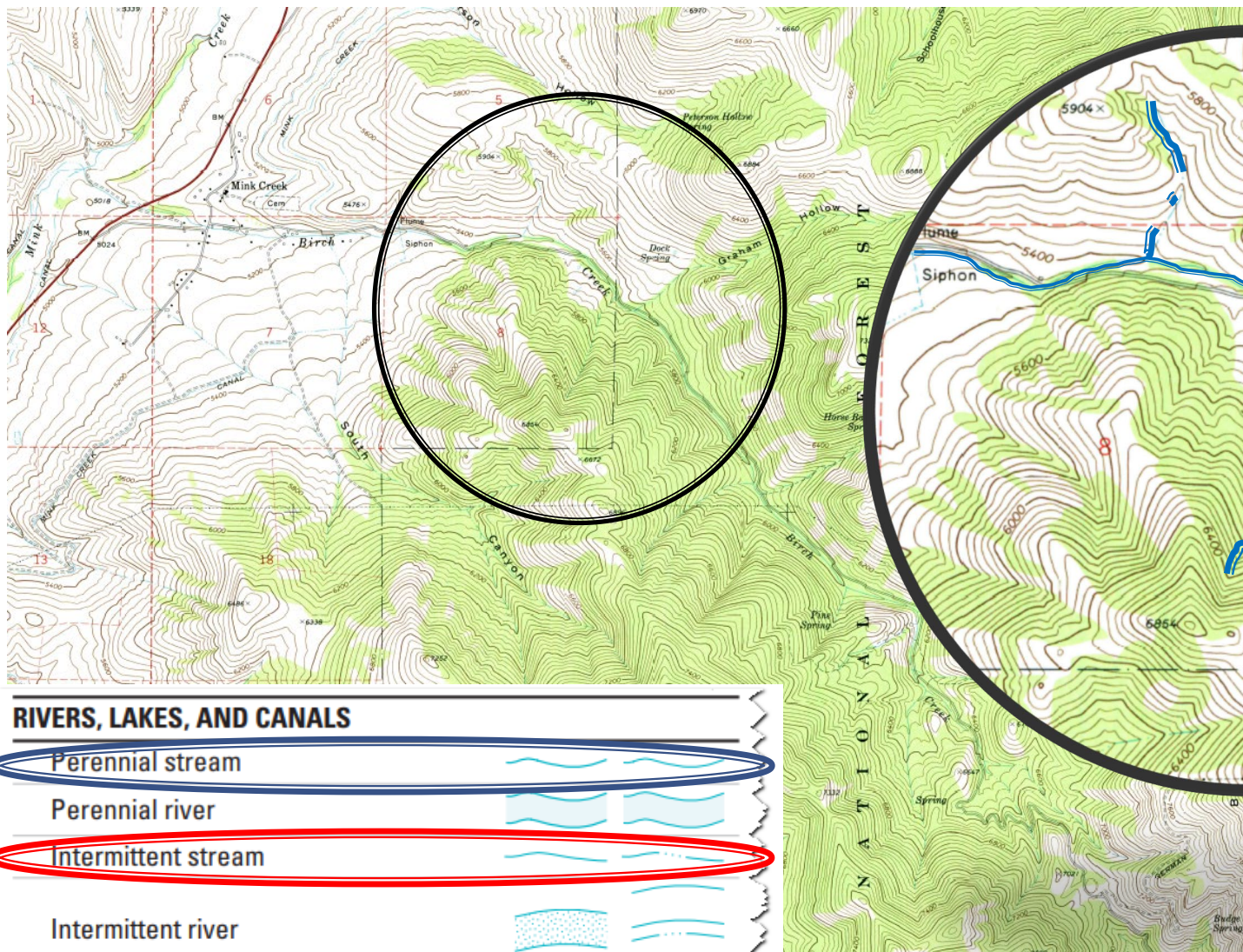
One of the Symptoms

June 14, 2007

Water has quit running



What's in a line type? Water!



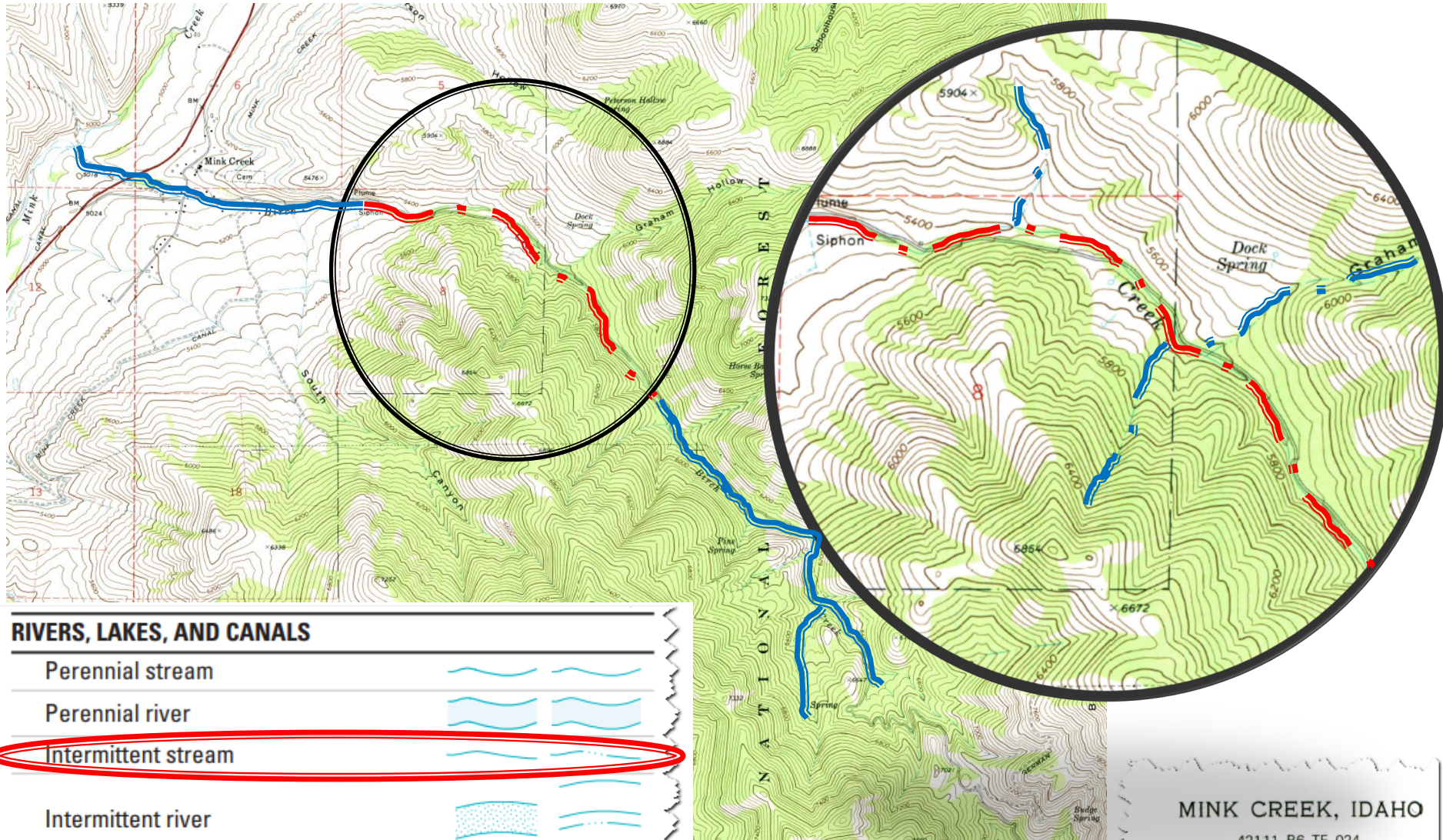
MINK CREEK, IDAHO

42111-B6-TF-024

1969

PHOTOINSPECTED 1980
DMA 3668 II NW-SERIES V893

What's happened since about 1985?



RIVERS, LAKES, AND CANALS

Perennial stream



Perennial river



Intermittent stream



Intermittent river



Disappearing stream



Falls, small



MINK CREEK, IDAHO

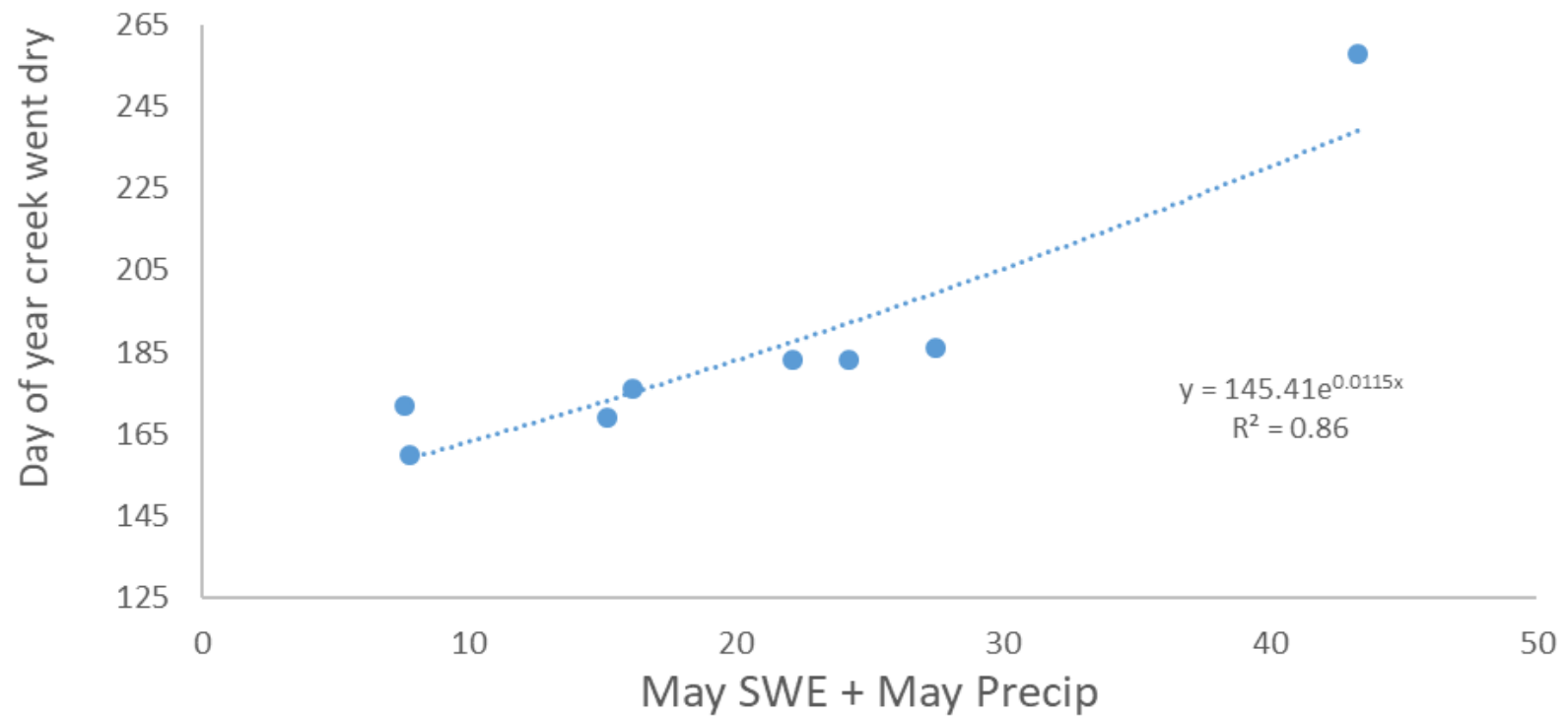
42111-B6-TF-024

1969

PHOTOINSPECTED 1980
DMA 3668 II NW-SERIES V893

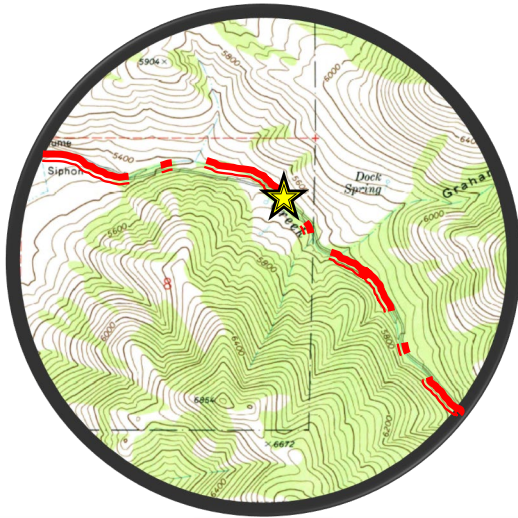
Day Birch Creek stopped flowing predicted by
May 1 snow water equivalent and May precipitation,
before BDAs/Beavers introduced

● Before



June 18, 2007 – Diurnal Differences

8:30 AM Stream flow is getting low



8:19 PM Flow has ceased by late afternoon or early evening.

7:39 AM June 19, 2007 – Next Morning

Water is flowing again



7:38 PM June 19, 2007 – That Evening

Flow has stopped again



7:41 AM June 19, 2007

Lotsa water in the morning.....



cc Jay Wilde

7:40 PM June 19, 2007

.....and no water
running in the
early evening.

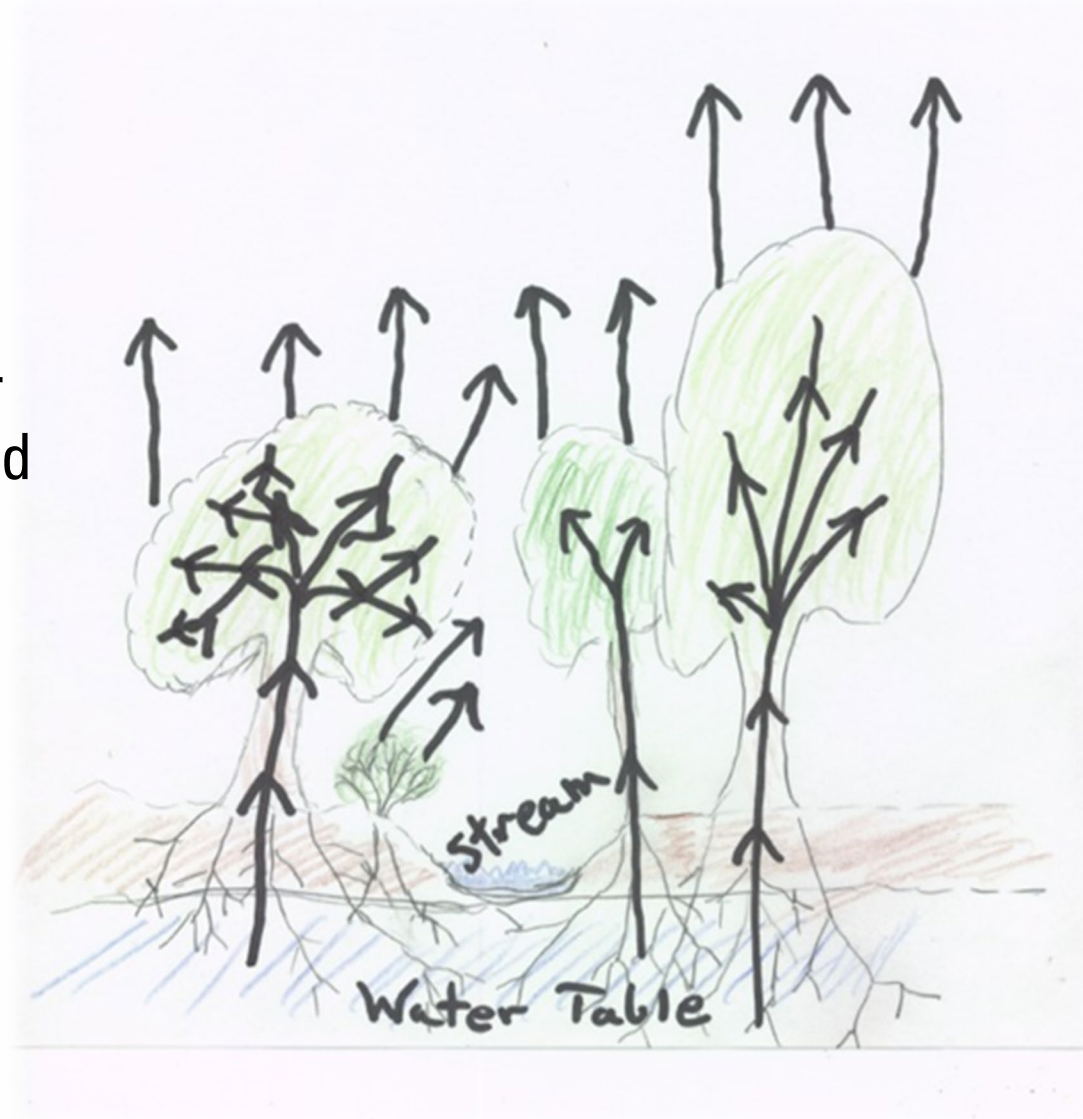
So.....What's
goin' on here?



CC Jay Wilde

Evapotranspiration

- Water is drawn from the water table via the root systems of the trees and other vegetation into their foliage and then transpired into the atmosphere.



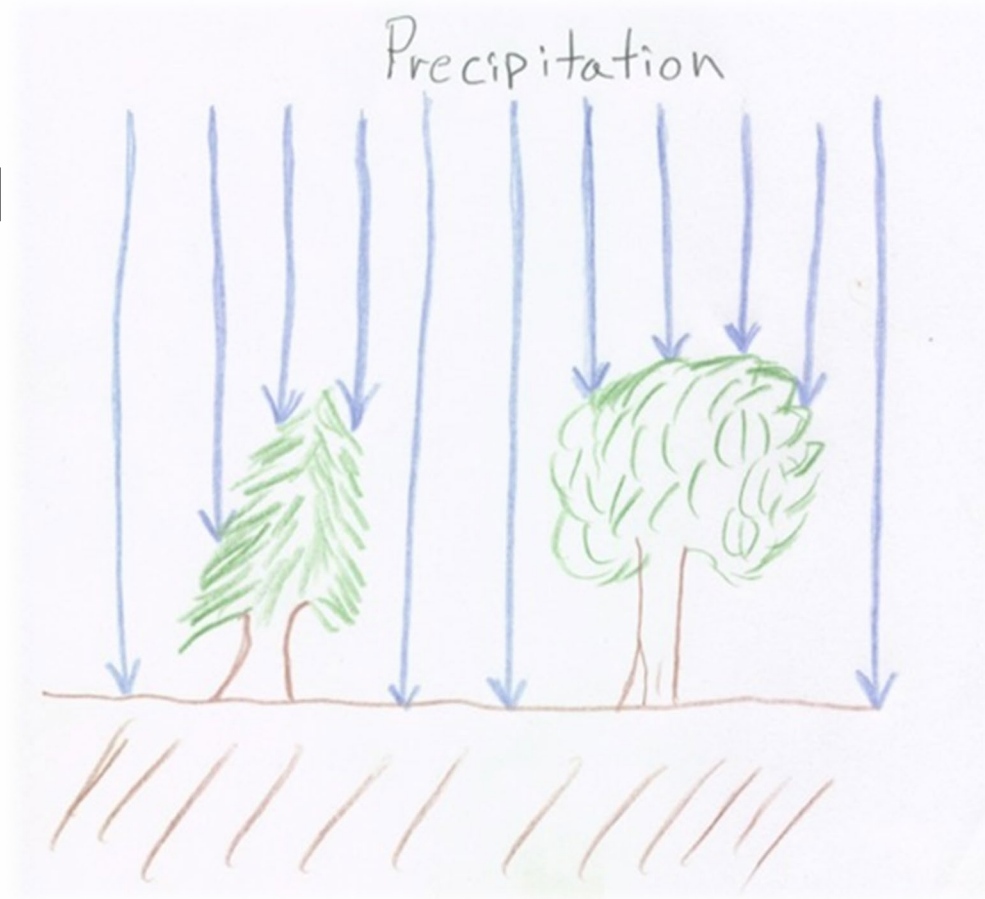
Riparian Areas

- The riparian area on the national forest is dense and populated with phreatophyte type vegetation.



Interception

- Precipitation is blocked from reaching the ground directly and entering the water table. Much is either evaporated or in the case of snow, sublimated back to the atmosphere

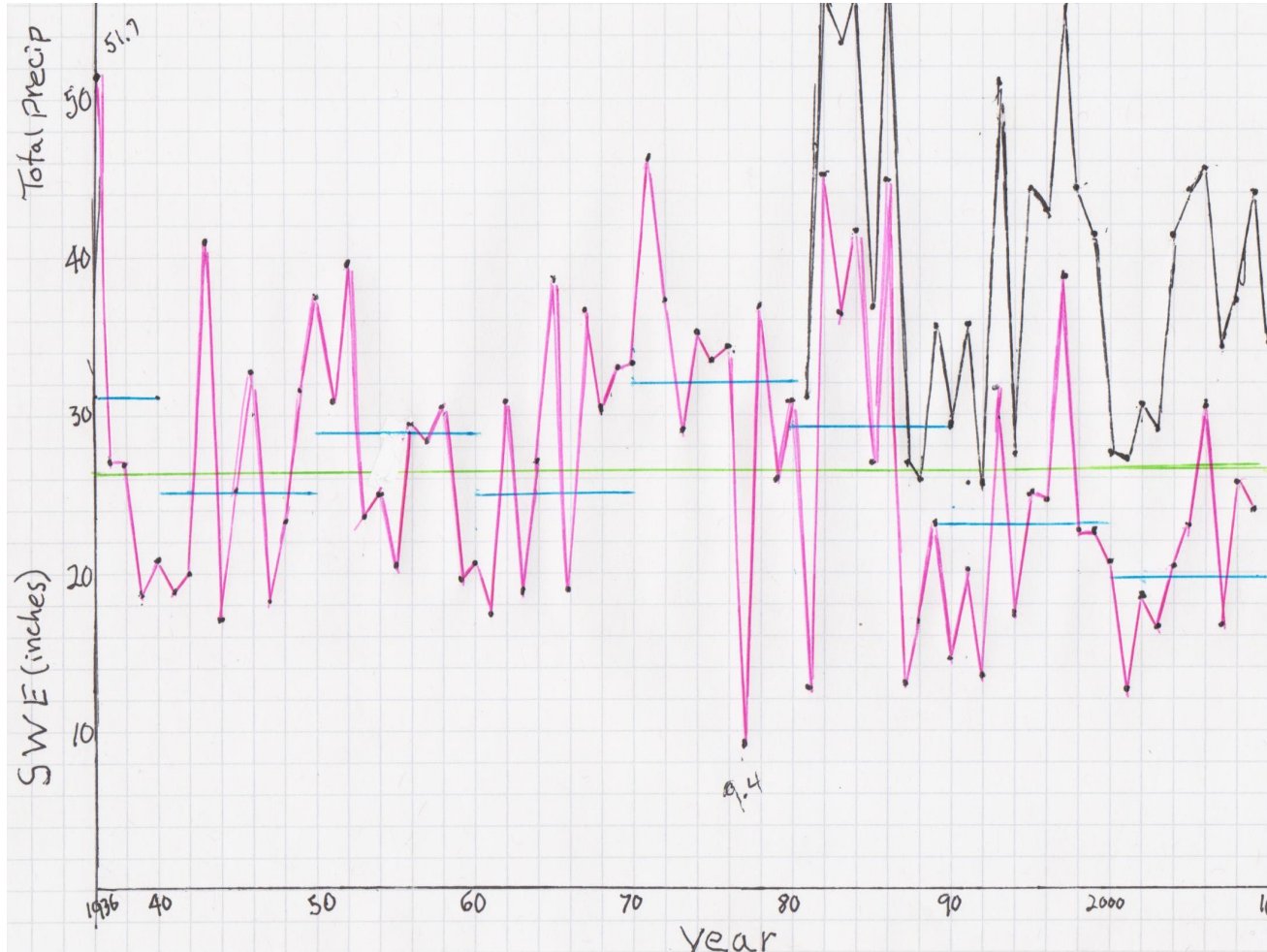


Interception

- Trees can slow or block precipitation from reaching the ground and entering the water table.



Snow & Rain History



2010-2019
SWE
Ave 22.75

The pink line is SWE. The black line is total precip (data only available for 30 years)

Green line is the average SWE for 1936-2009.

Blue lines are the average SWE for each decade.

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Line Intercept @ Dock Flat



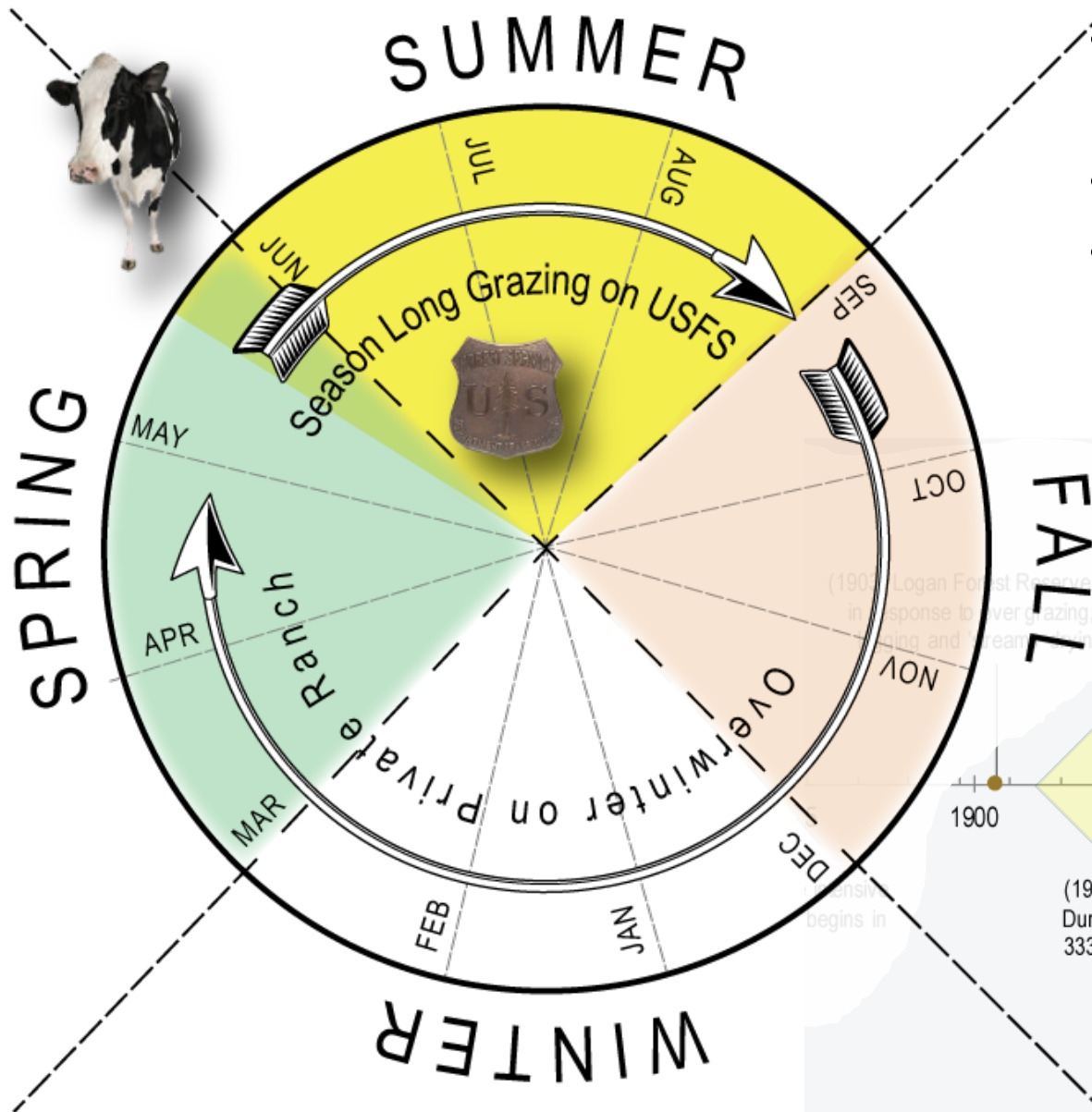
Line Intercept Results...

Plant Density *Wyethia amplexicaulis*

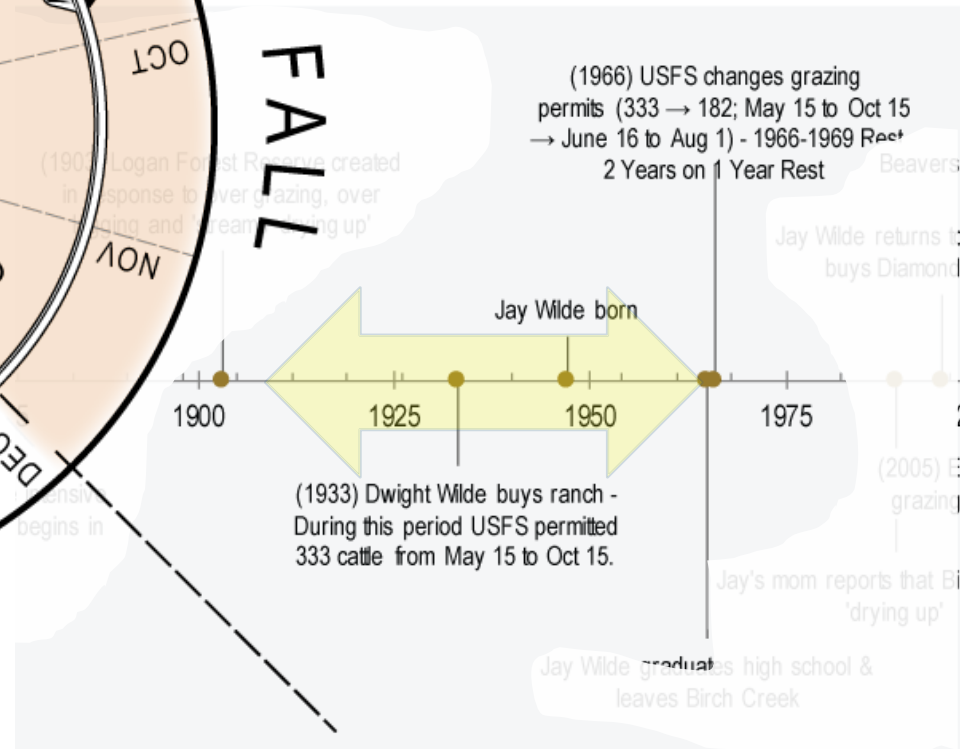
Transect 2	2010	25.4%	2019	5.8%
Transect 3	2010	38.1%	2019	6.75%
Transect 4	2010	64.4%	2019	24%



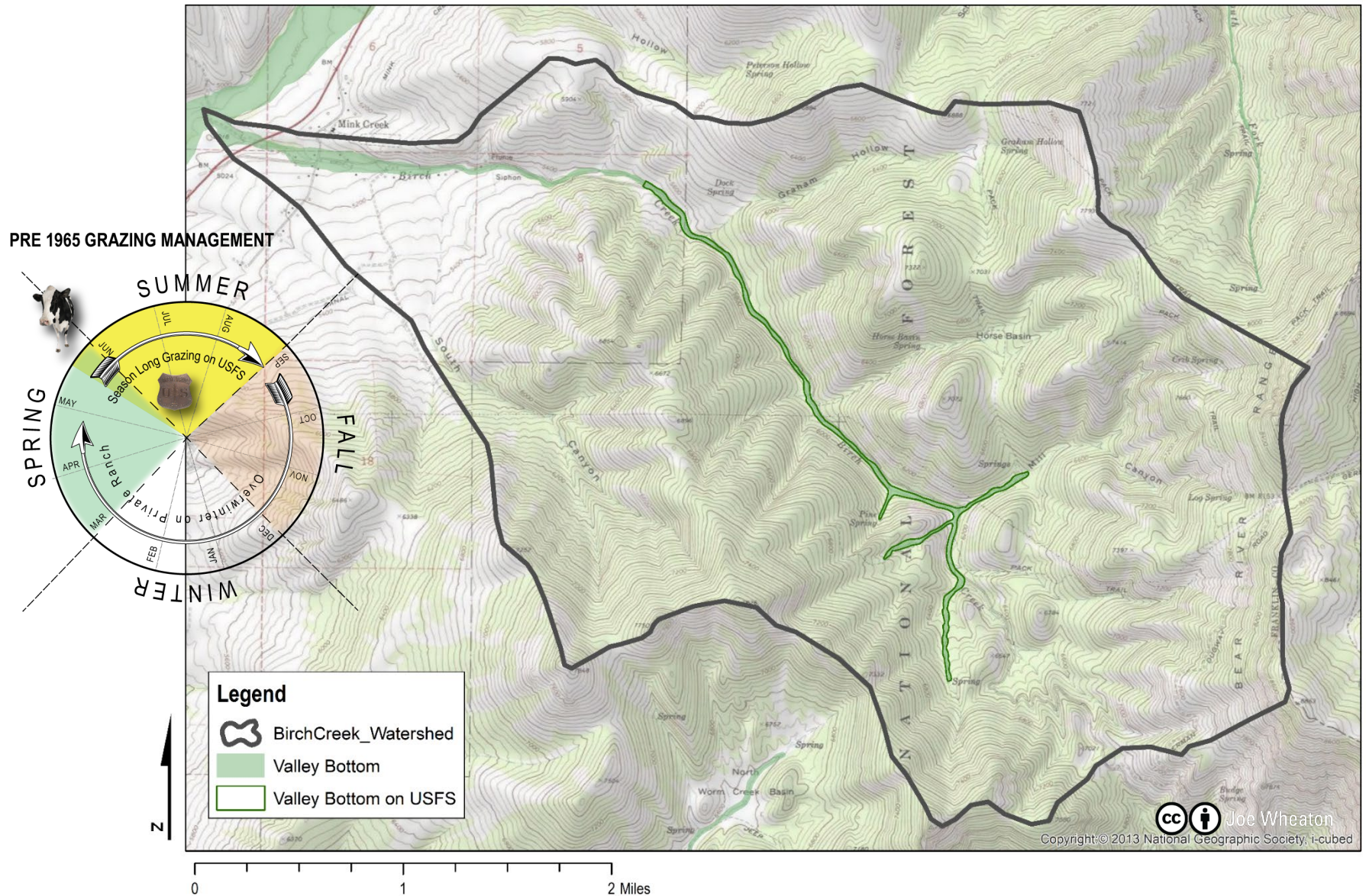
PRE 1965 GRAZING MANAGEMENT



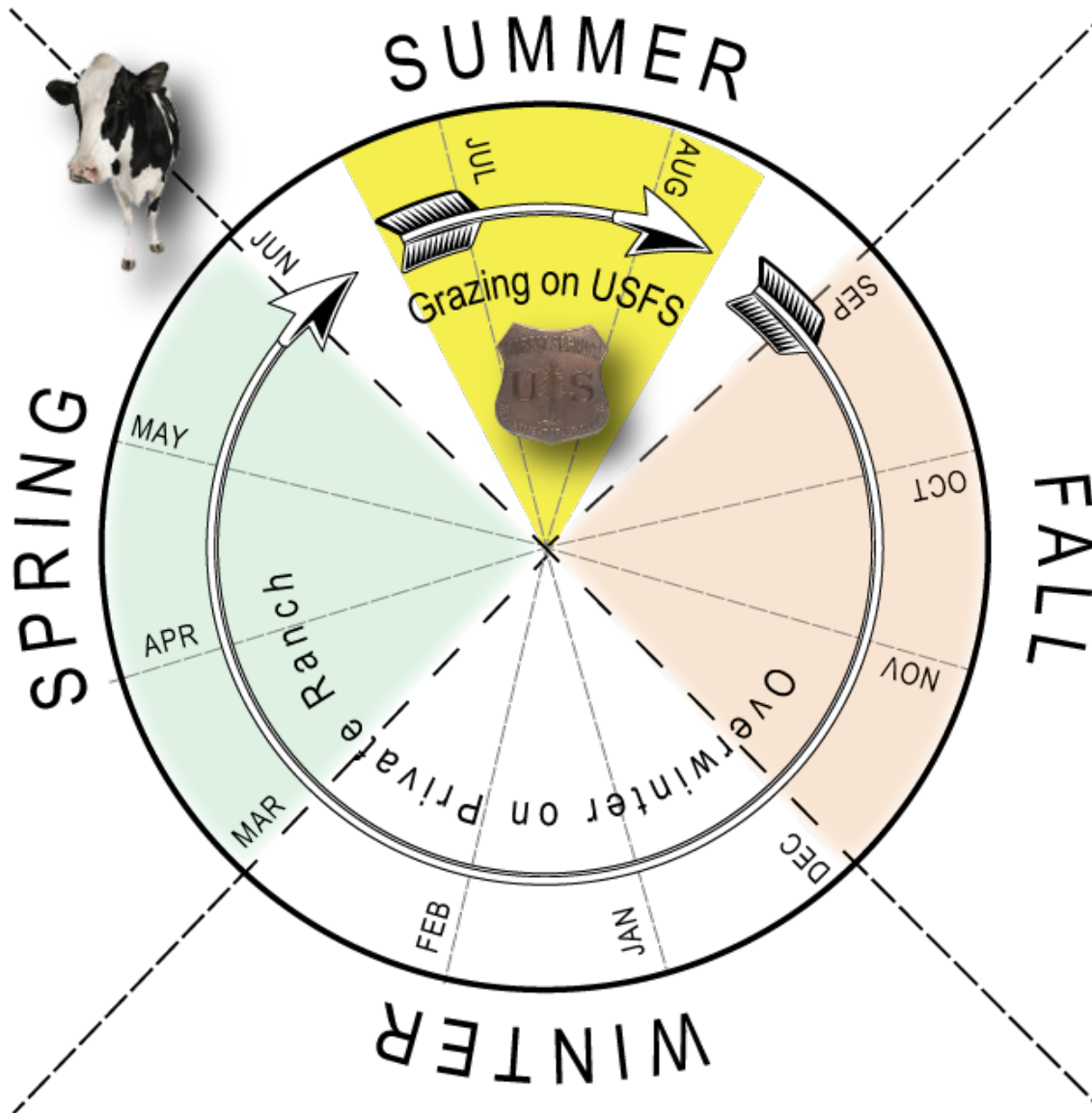
- Grazing from May 15 – Oct 15
- Season-long grazing
- About 333 permits



What That Really Meant... Only Valley Bottom Used



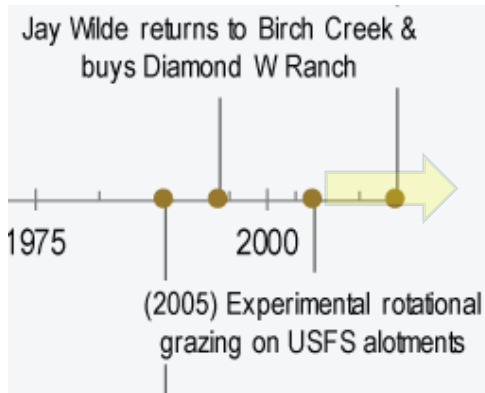
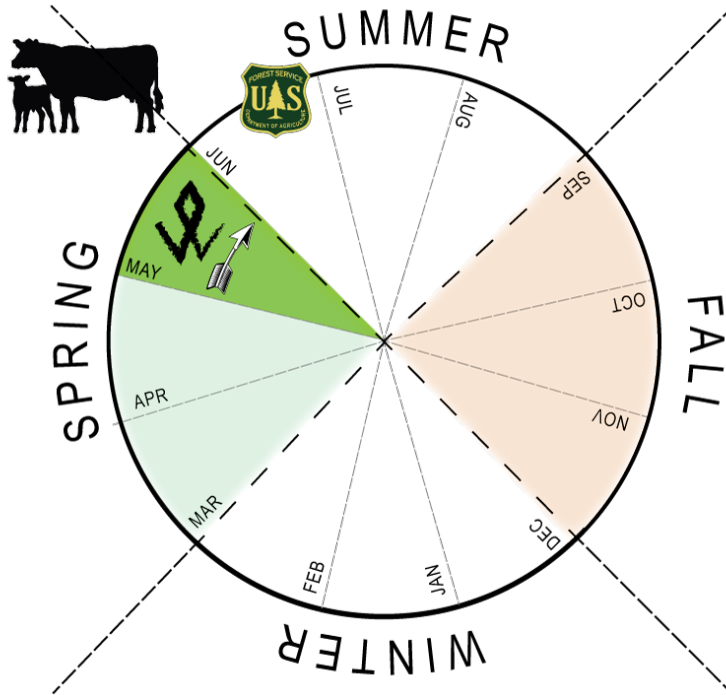
1966 to 2005 GRAZING MANAGEMENT



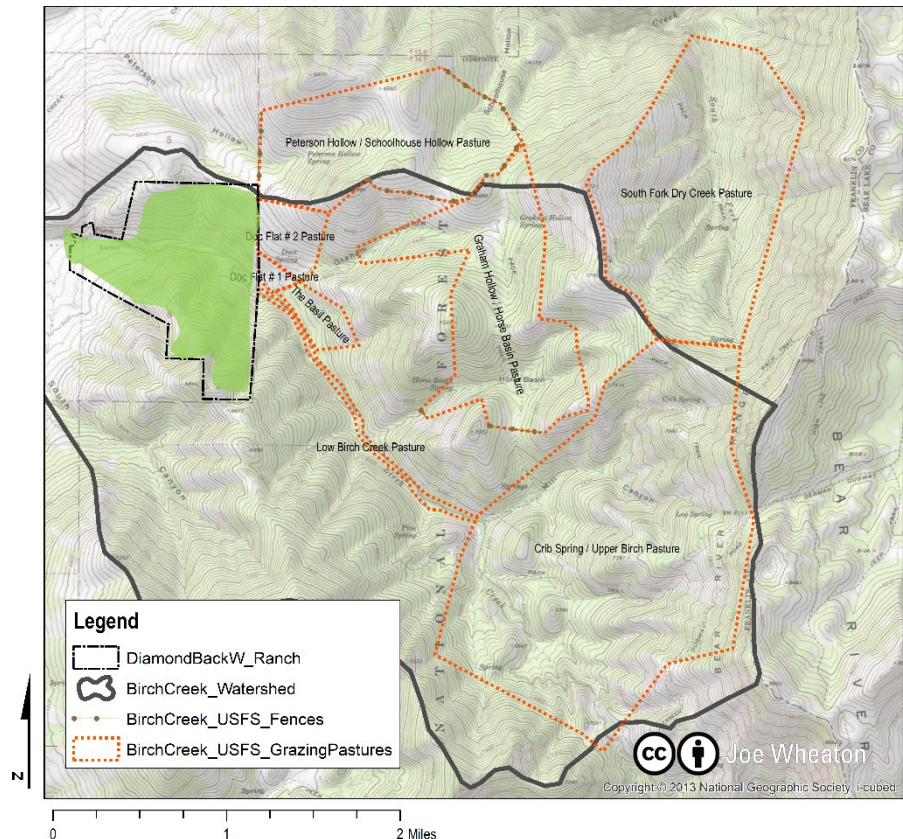
- USFS cuts from 333 to 182 permits
- Grazing from June 16 to Aug 15
- Season-long grazing

Try Something New

POST 2005 GRAZING MANAGEMENT

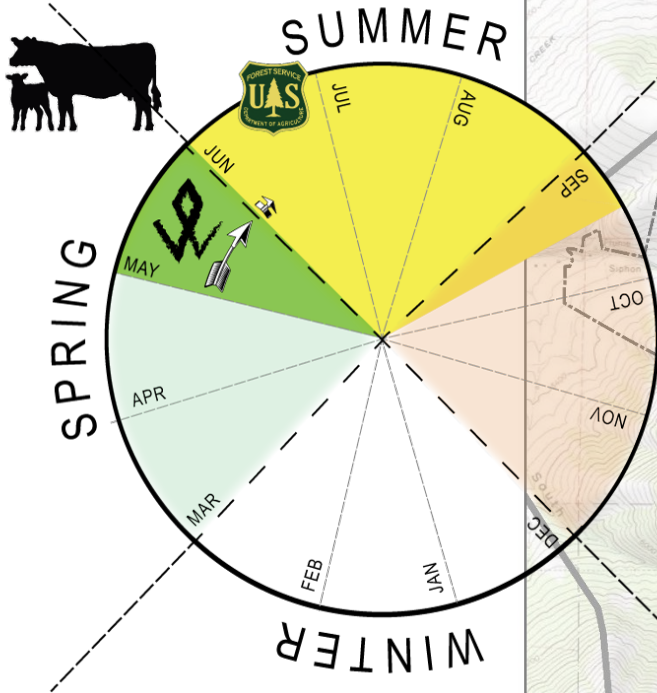


- After taking over as President of Grazing Association for Mink Creek Allotment in 2003, proposed an experiment in 2009 with USFS

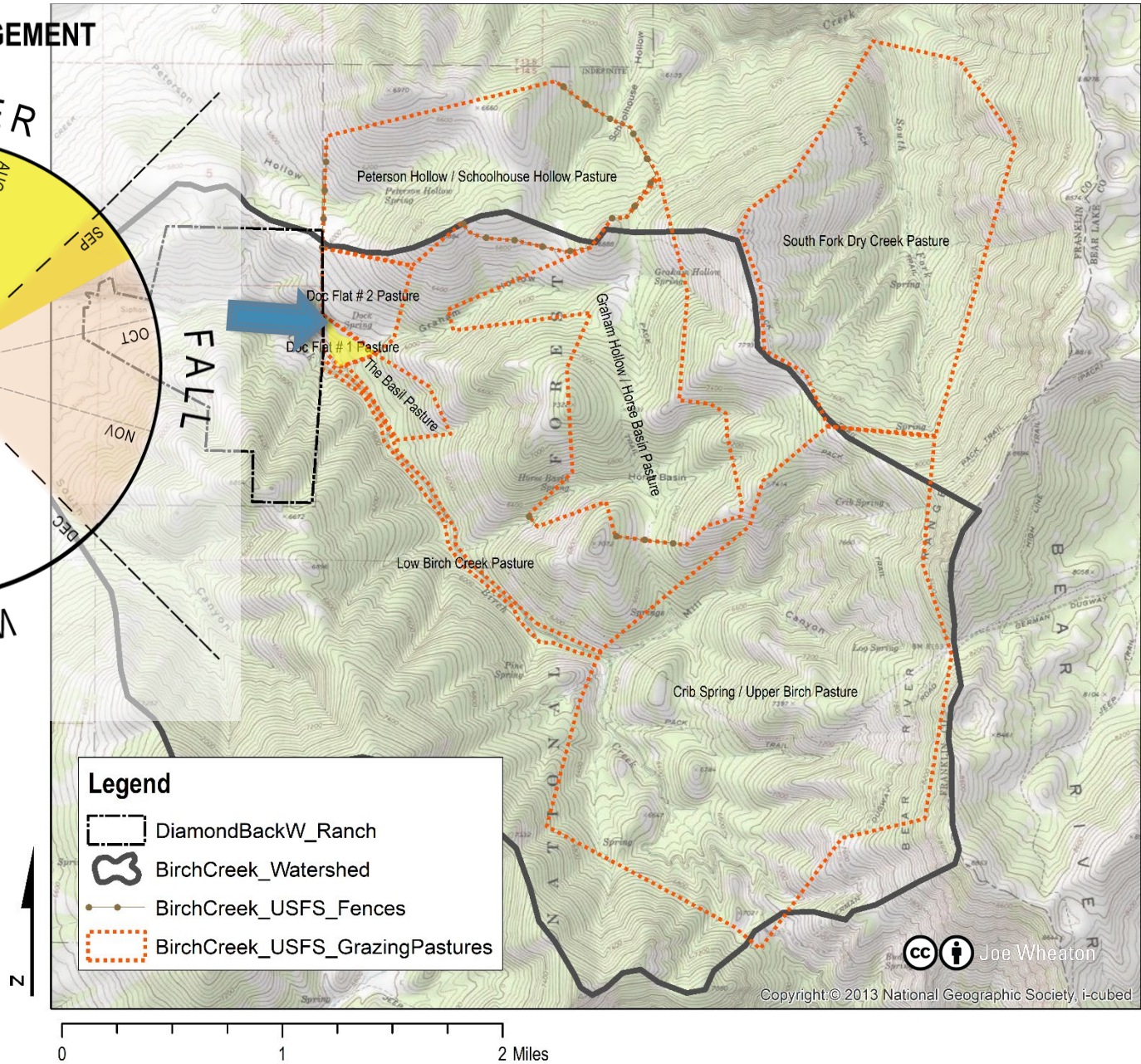


Starting Early June Now...

POST 2005 GRAZING MANAGEMENT

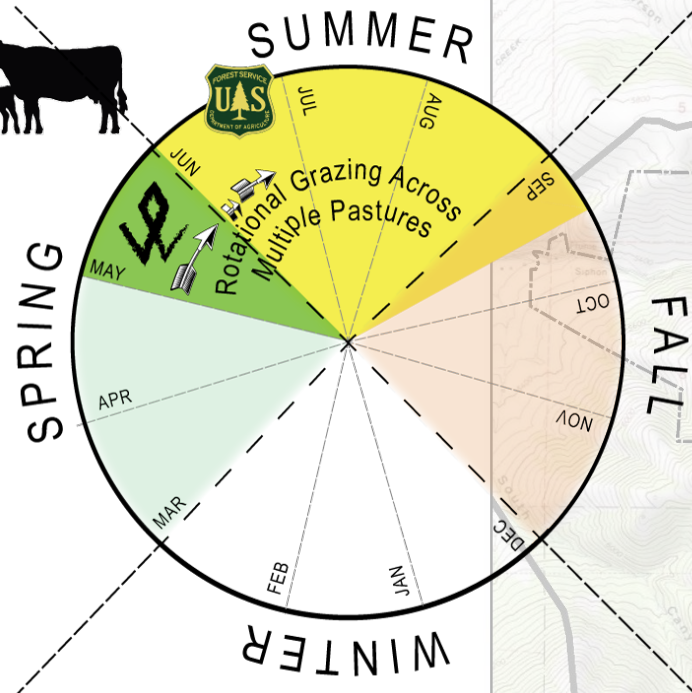
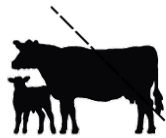


- June 4 – 7
- Doc Flat 1 Pasture

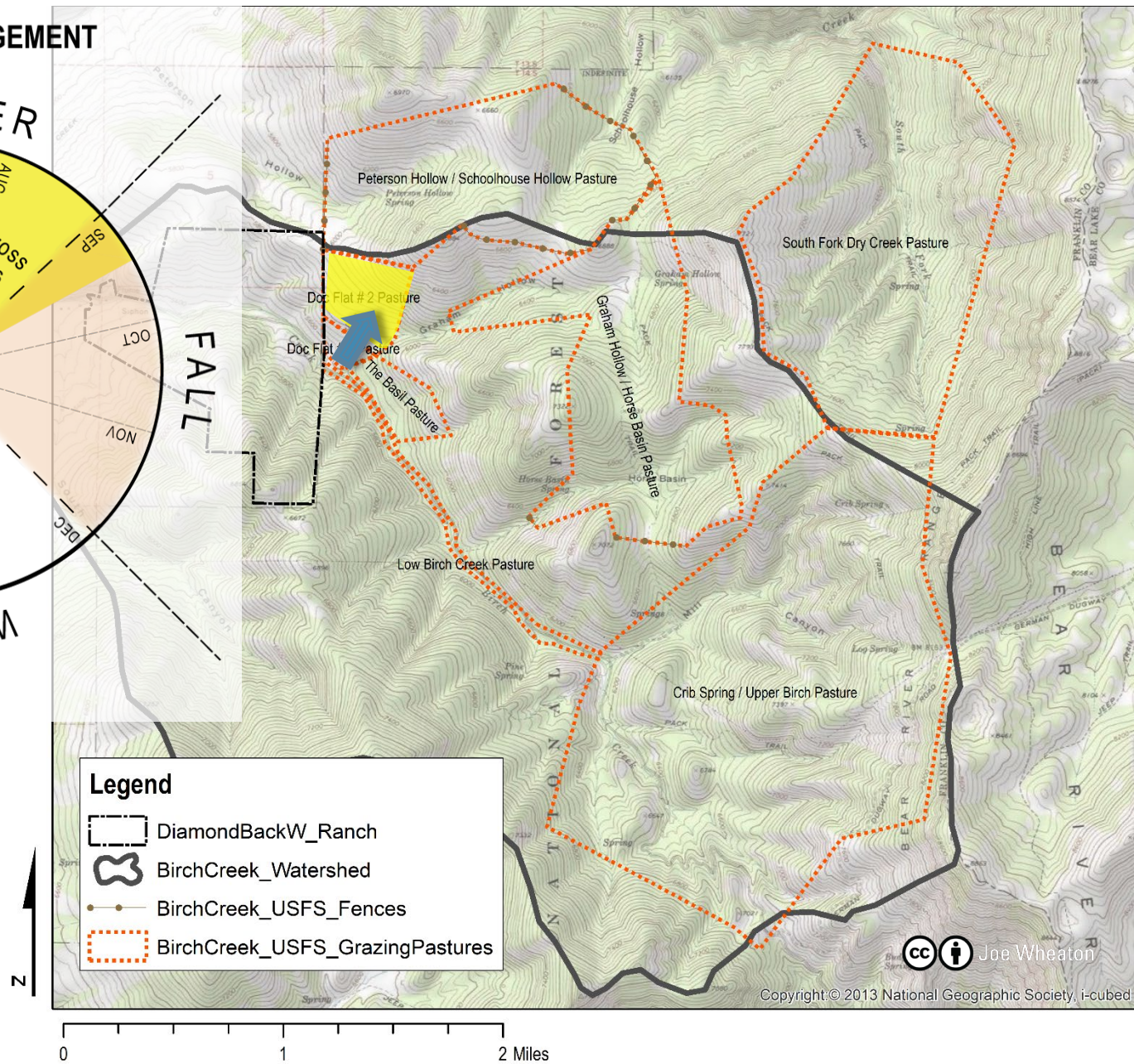


High-intensity, Short Duration

POST 2005 GRAZING MANAGEMENT

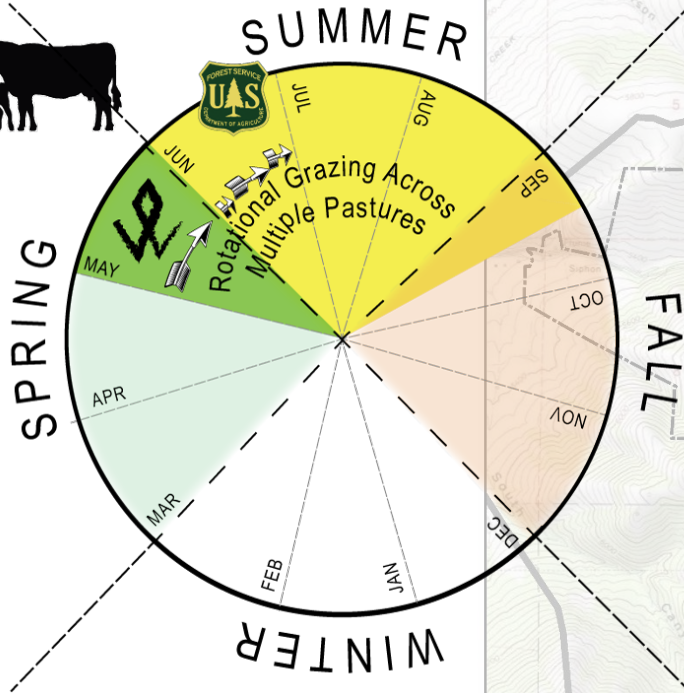
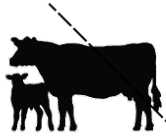


- June 7 – 25
- Doc Flat 2 Pasture

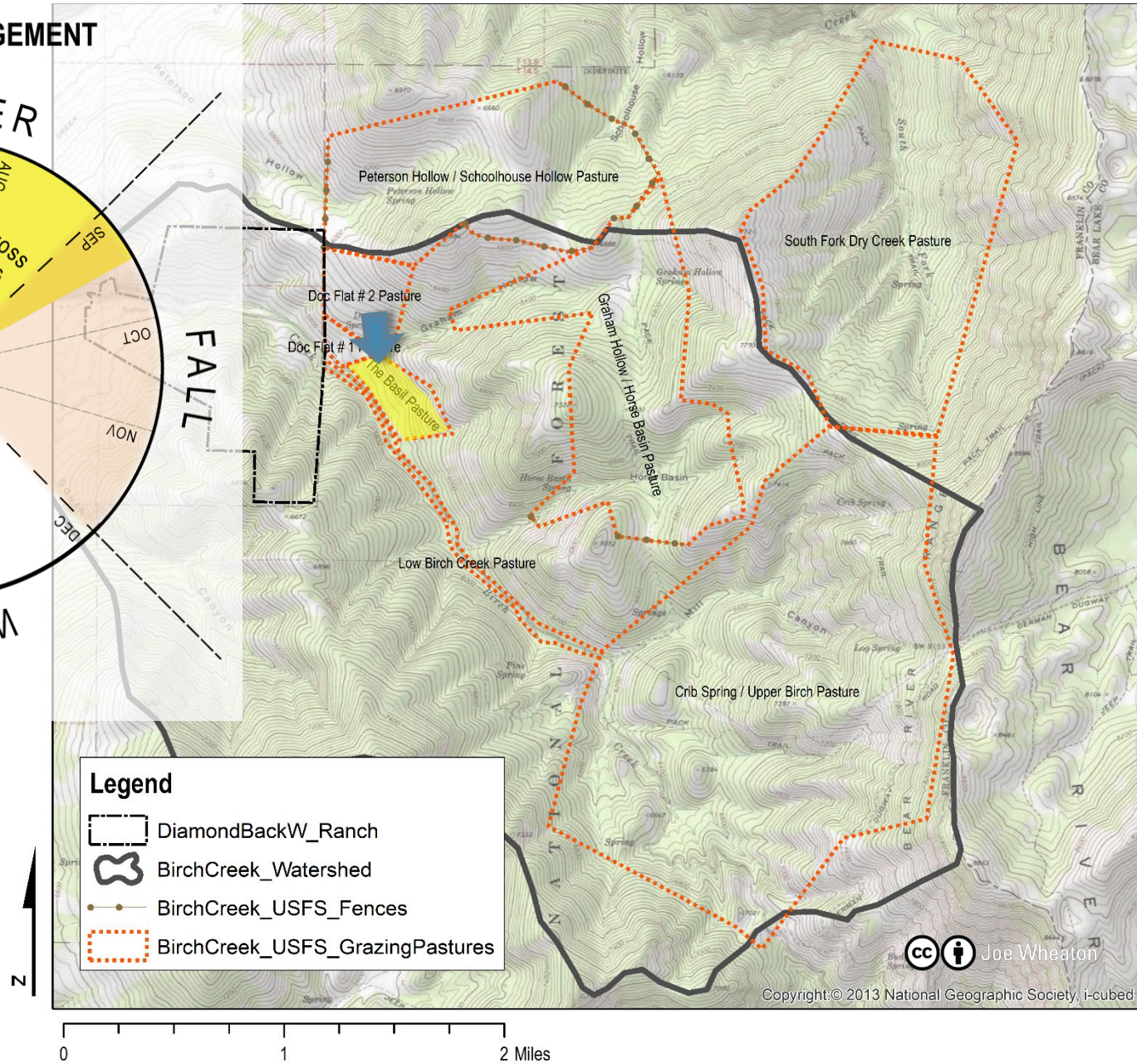


Three Roations During June Alone

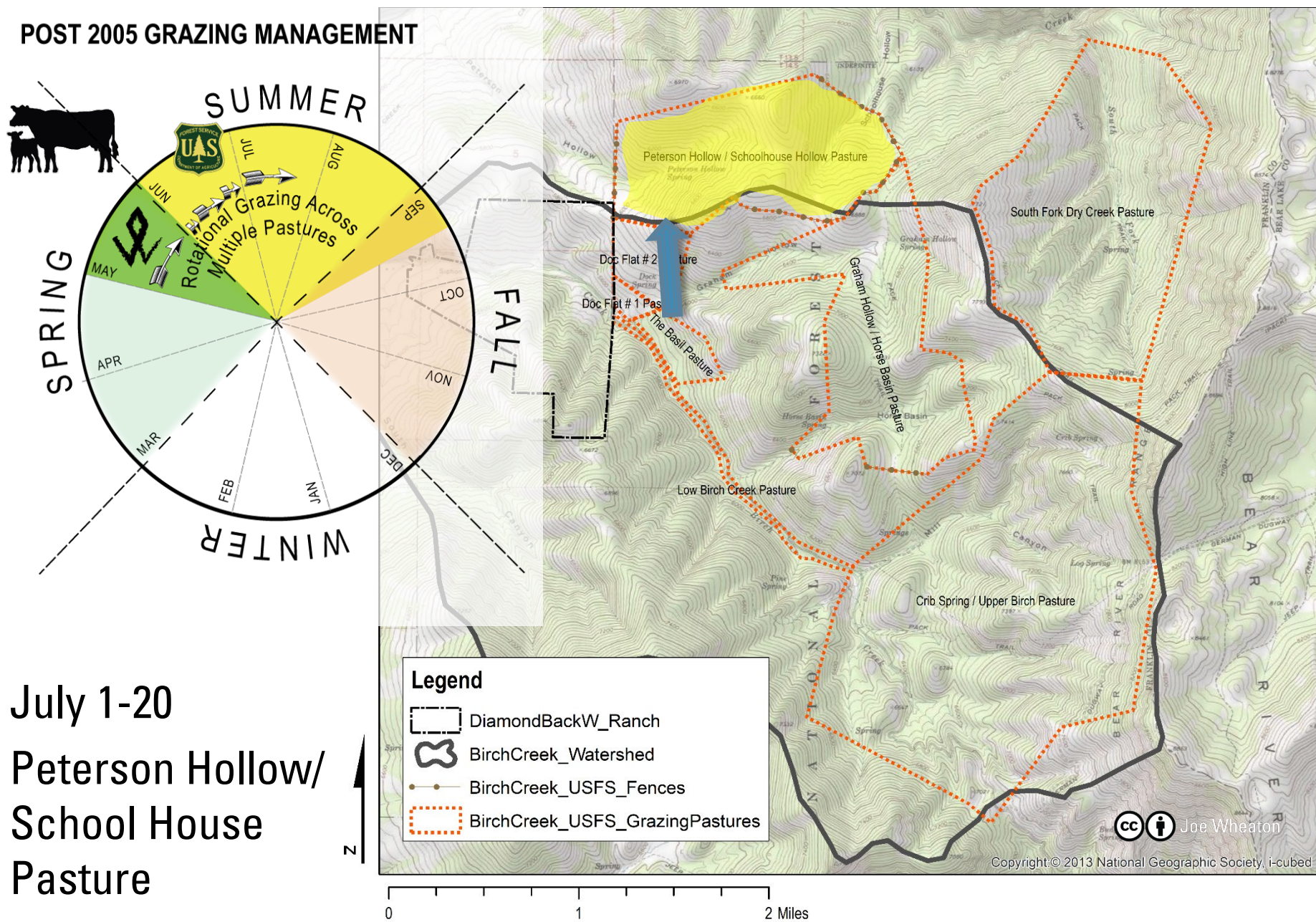
POST 2005 GRAZING MANAGEMENT



- June 25 – July 1
- Basil Pasture



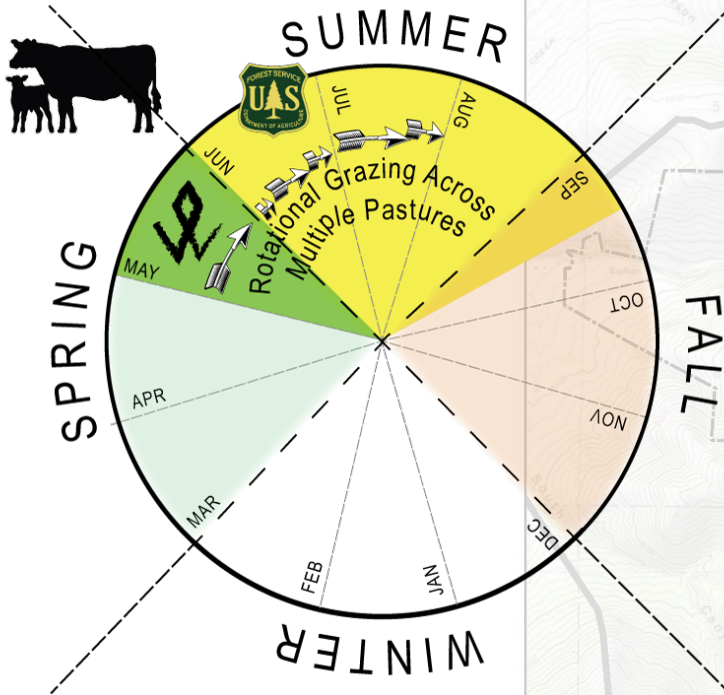
Early July... Moved Just Out of Birch



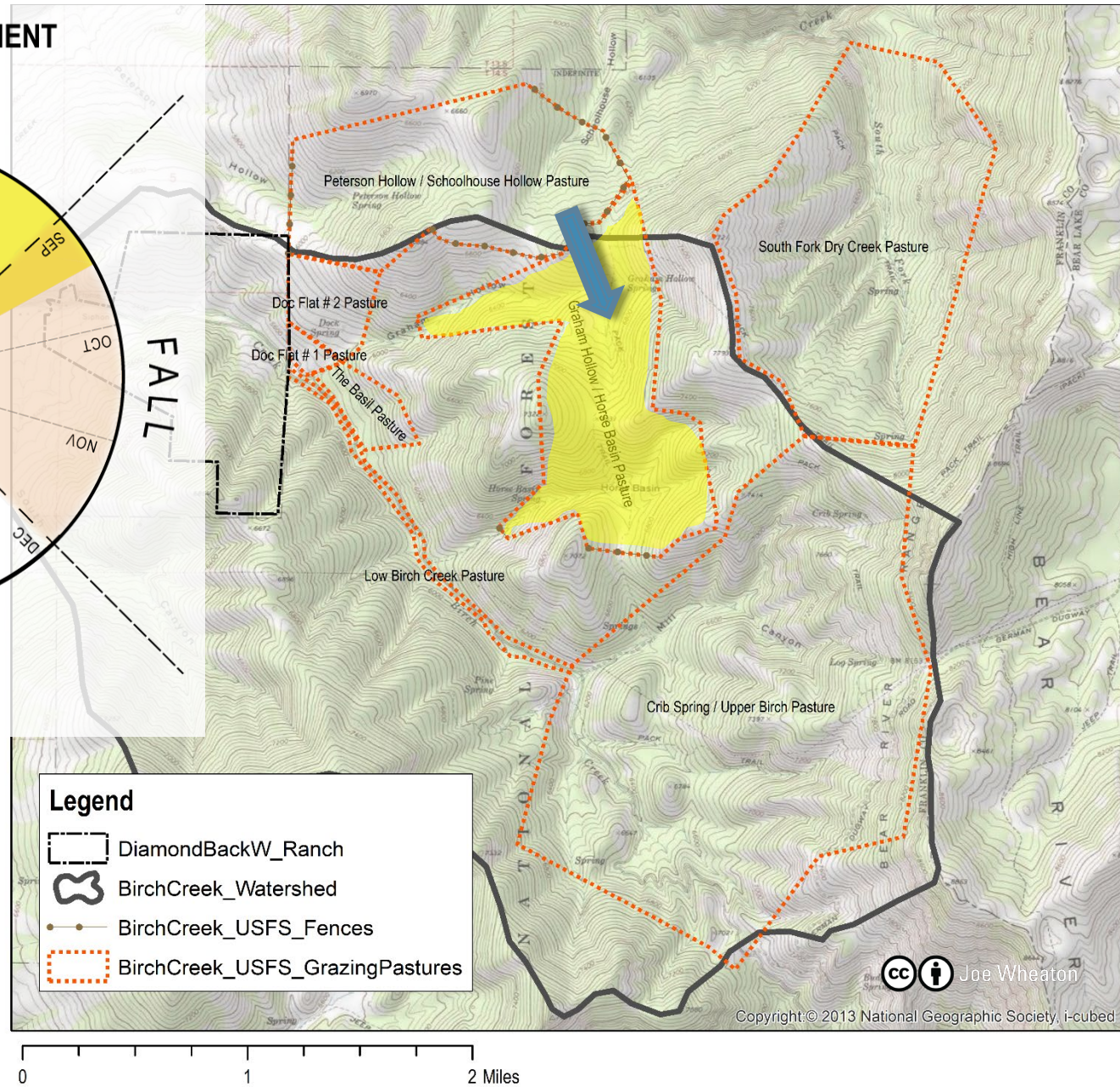
- July 1-20
- Peterson Hollow/
School House
Pasture

Last Part of July Back In Birch

POST 2005 GRAZING MANAGEMENT

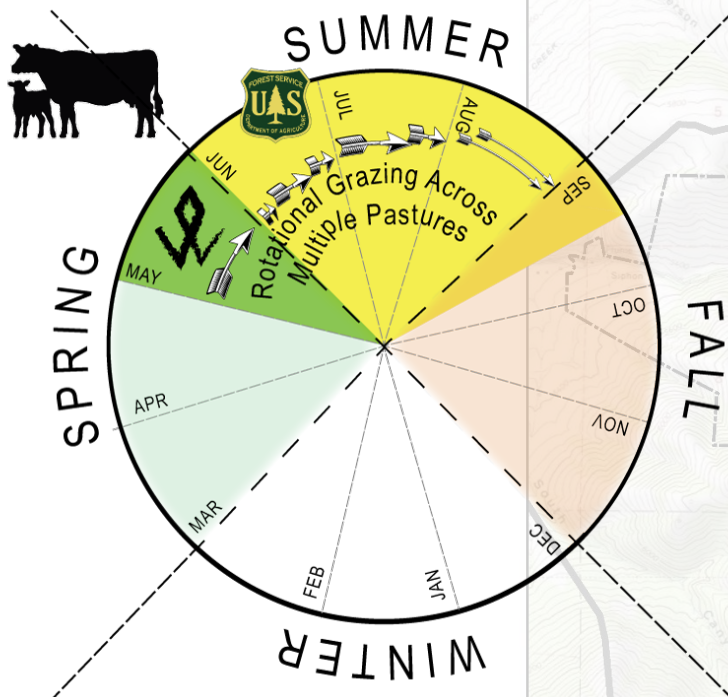


- July 20-Aug 1
- Graham Hollow/ Horse Basin Pasture

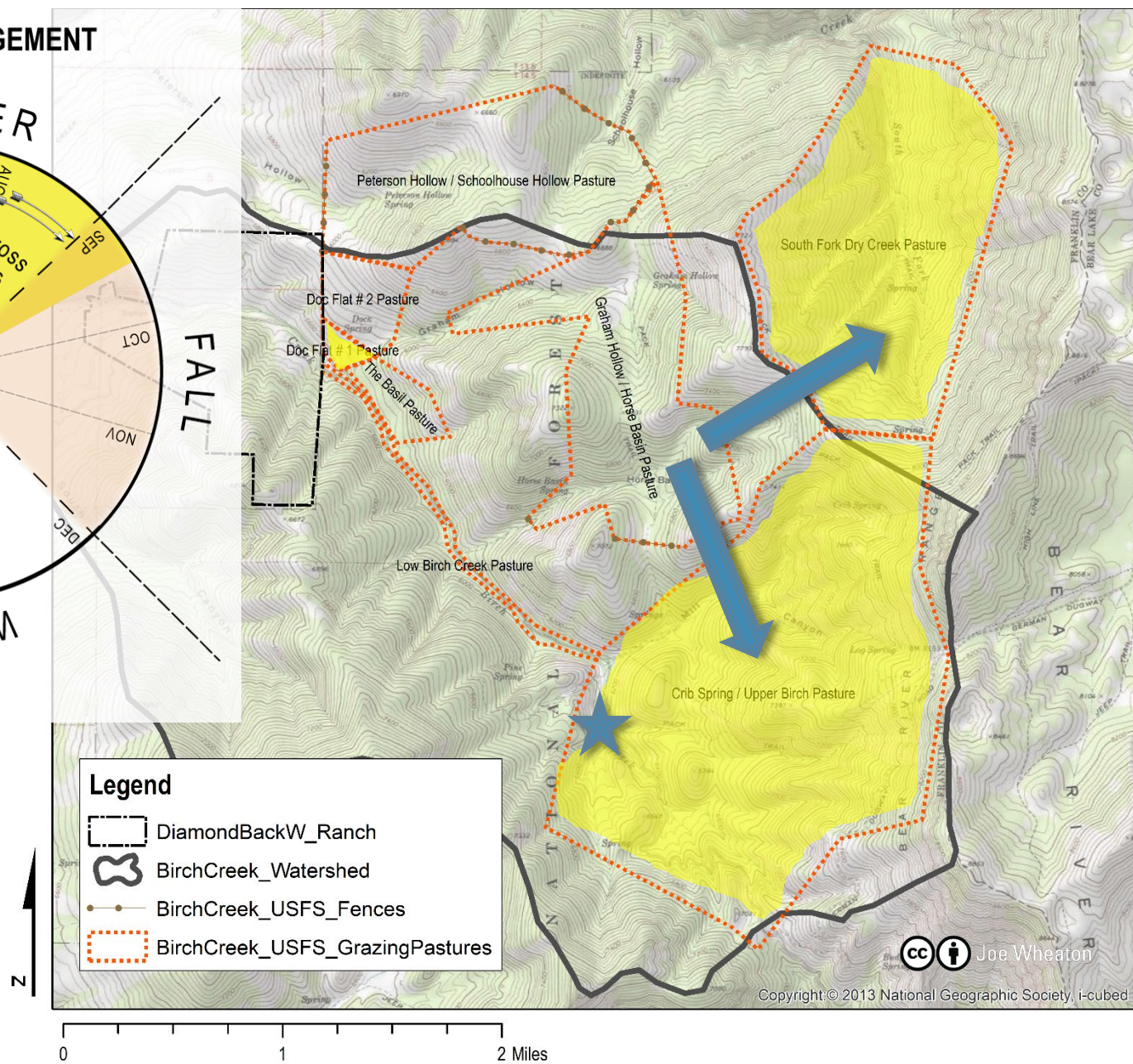


For Driest Month, Split Between 2

POST 2005 GRAZING MANAGEMENT

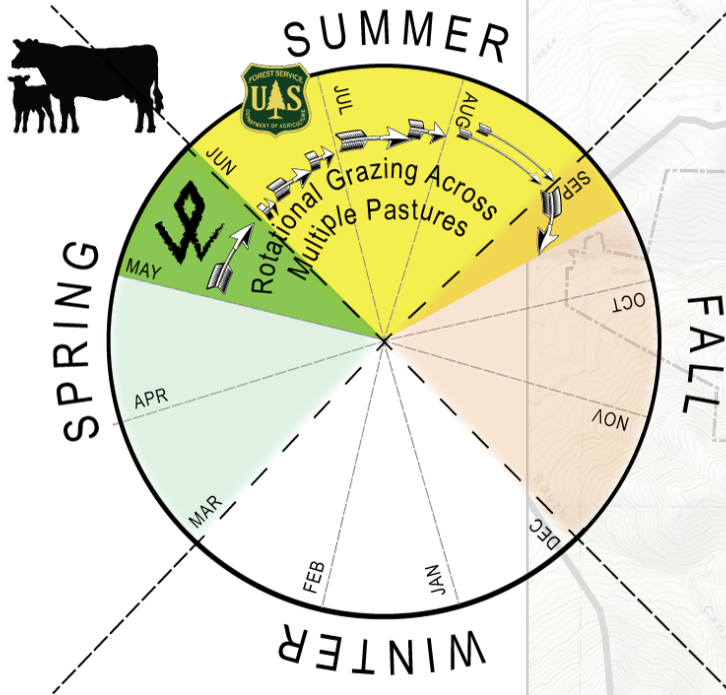


- August
- South Fork Dry Creek & Crib Spring/Upper Birch Pastures

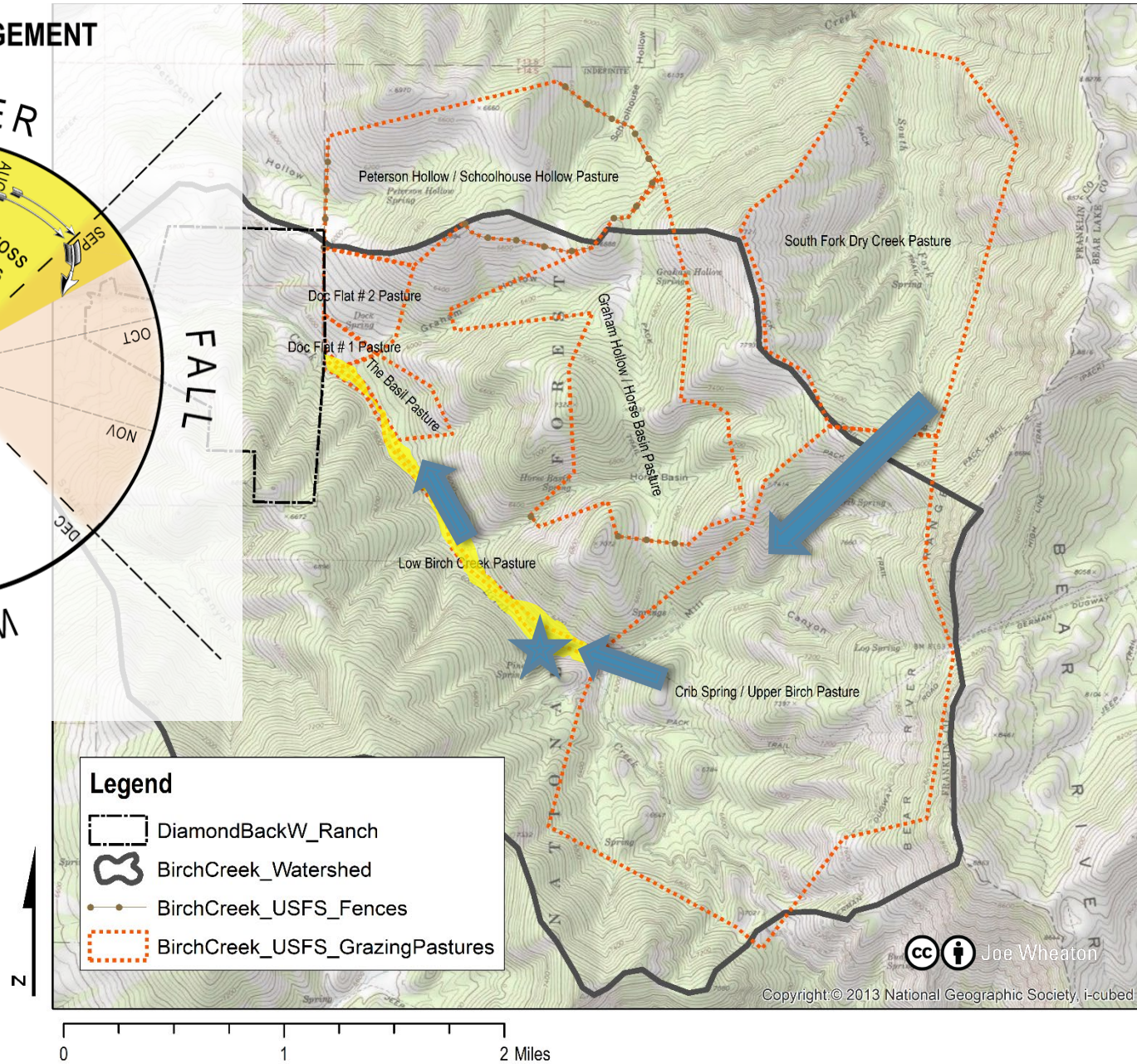


2 Weeks, Move Down Through Valley Bottom

POST 2005 GRAZING MANAGEMENT

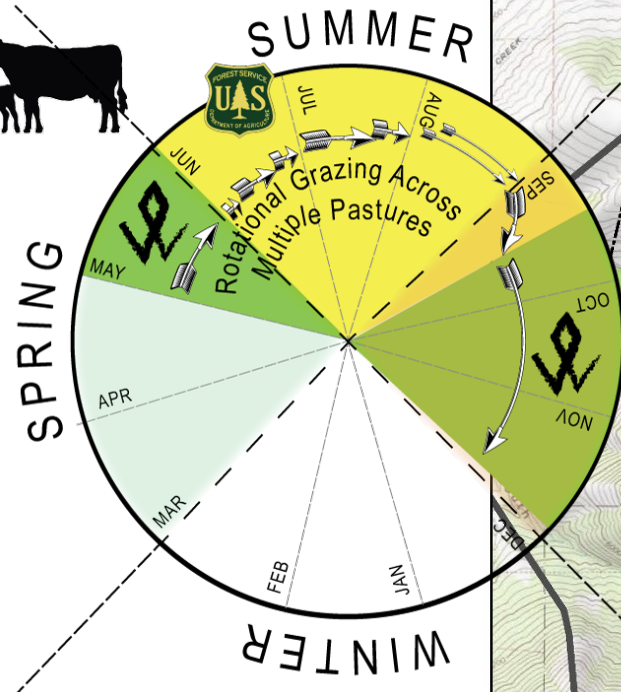
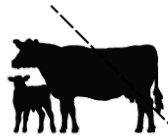


- Sep 1 - 15
- Lower Birch Creek Pasture

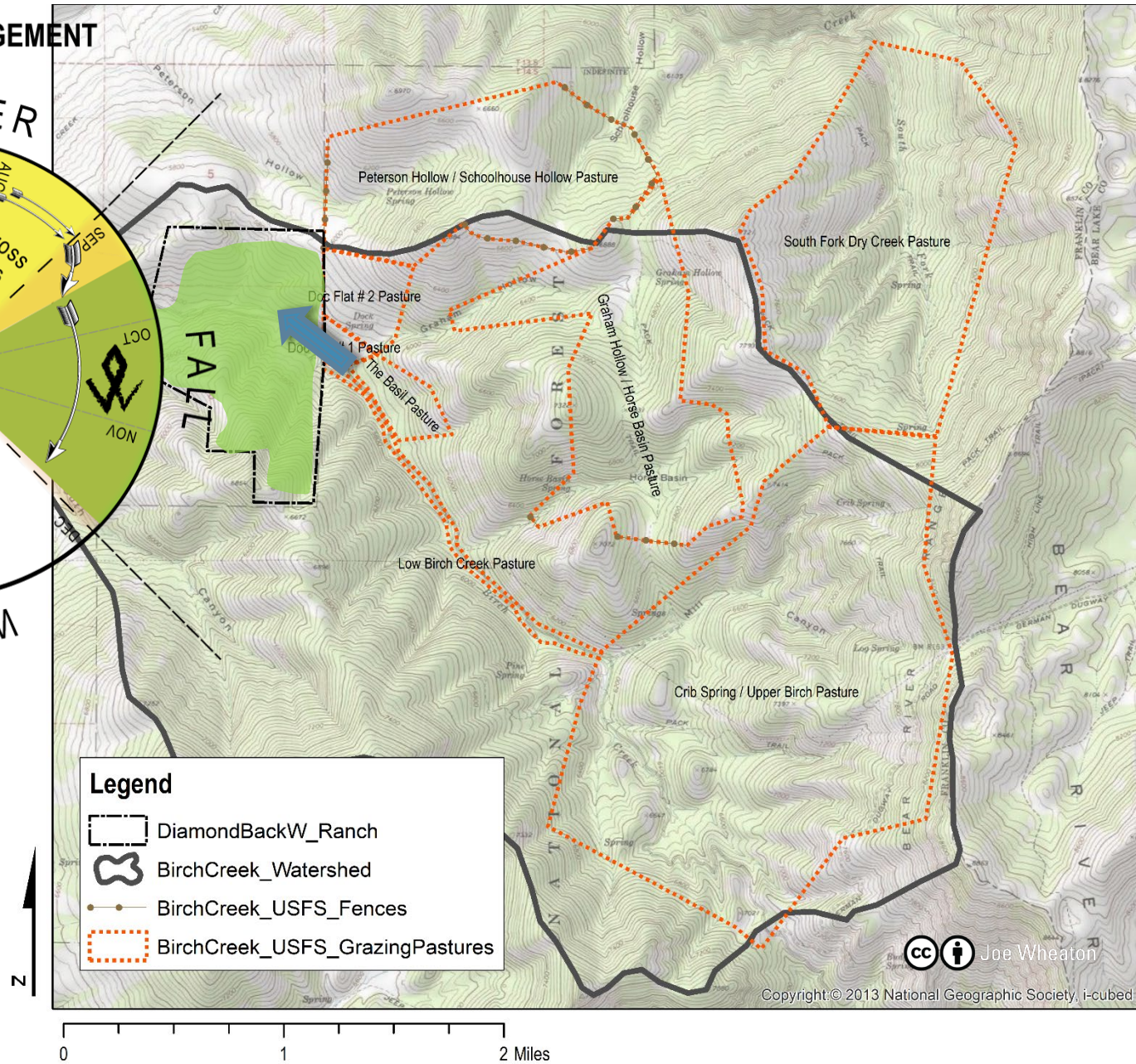


By, Sept 15, Back On Diamond Back W

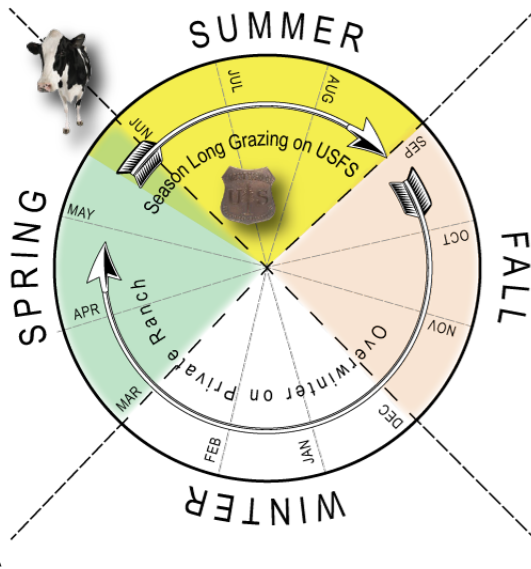
POST 2005 GRAZING MANAGEMENT



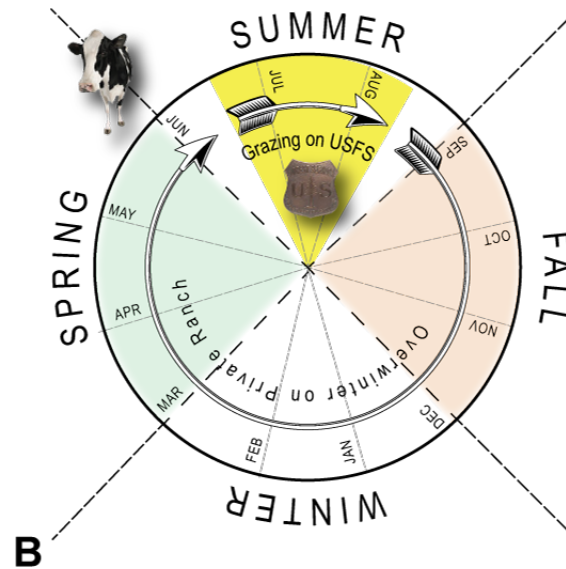
- Sep 15 – Late Nov
- Off USFS



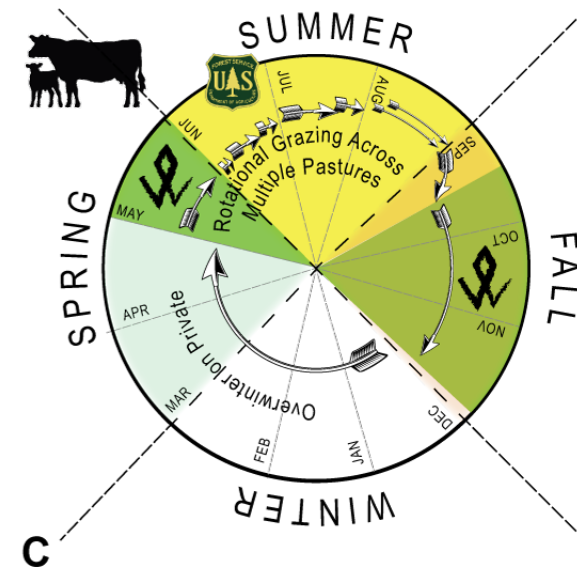
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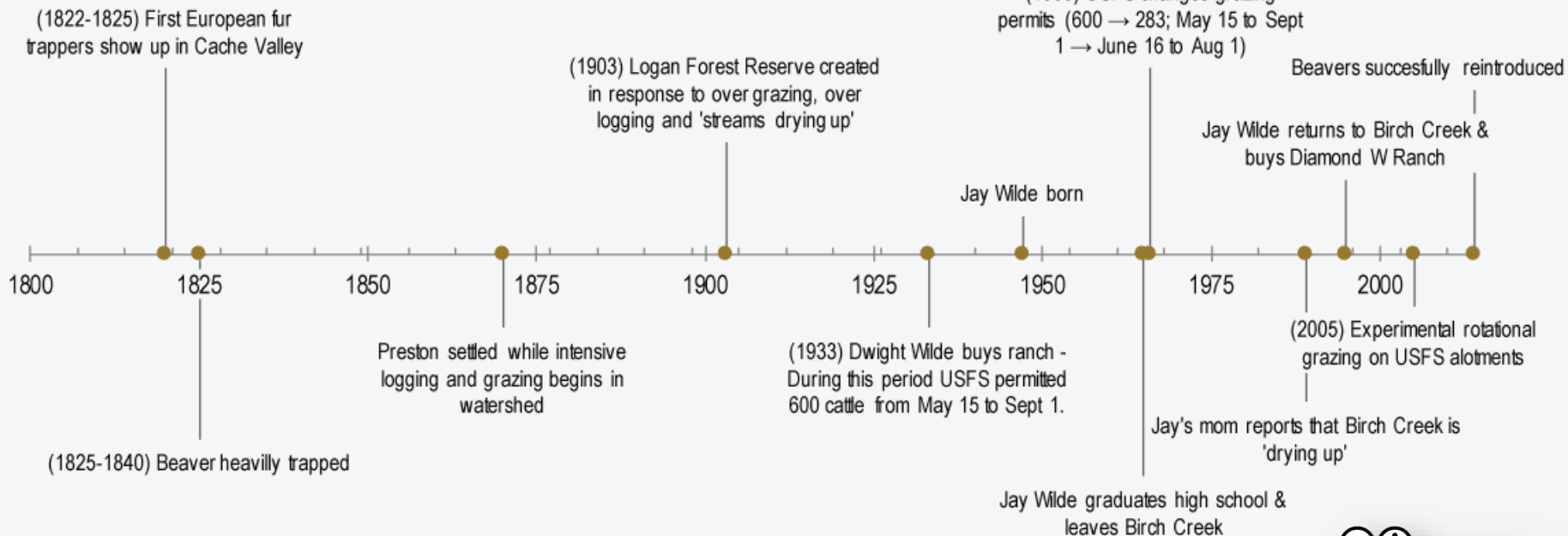
1966 to 2005 GRAZING MANAGEMENT



POST 2005 GRAZING MANAGEMENT



BIRCH CREEK HISTORY



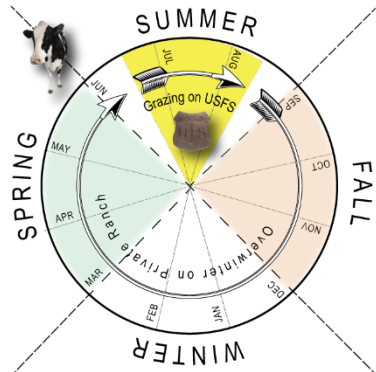
Pre Experimental, Rotational Grazing 2001

Closer to
season-long
grazing...

MIM site



1966 to 2005 GRAZING MANAGEMENT





OCT 29 2002



OCT 15 2003



OCT 4 2004





OCT 3 2006









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4. **Some hydrology experiments**
5. **What about beaver?**
6. **The BDA-assisted beaver restoration experiment**



Jay's 1996 Cottonwood Experiment

Photo from 1992

Legend

Another 300 feet of flow

Google Earth

Image U.S. Geological Survey



600 ft

8

Jay's 1996 Cottonwood Experiment

Photo from 1998 (after)

Legend

Another 300 feet of flow

Google Earth

Image U.S. Geological Survey



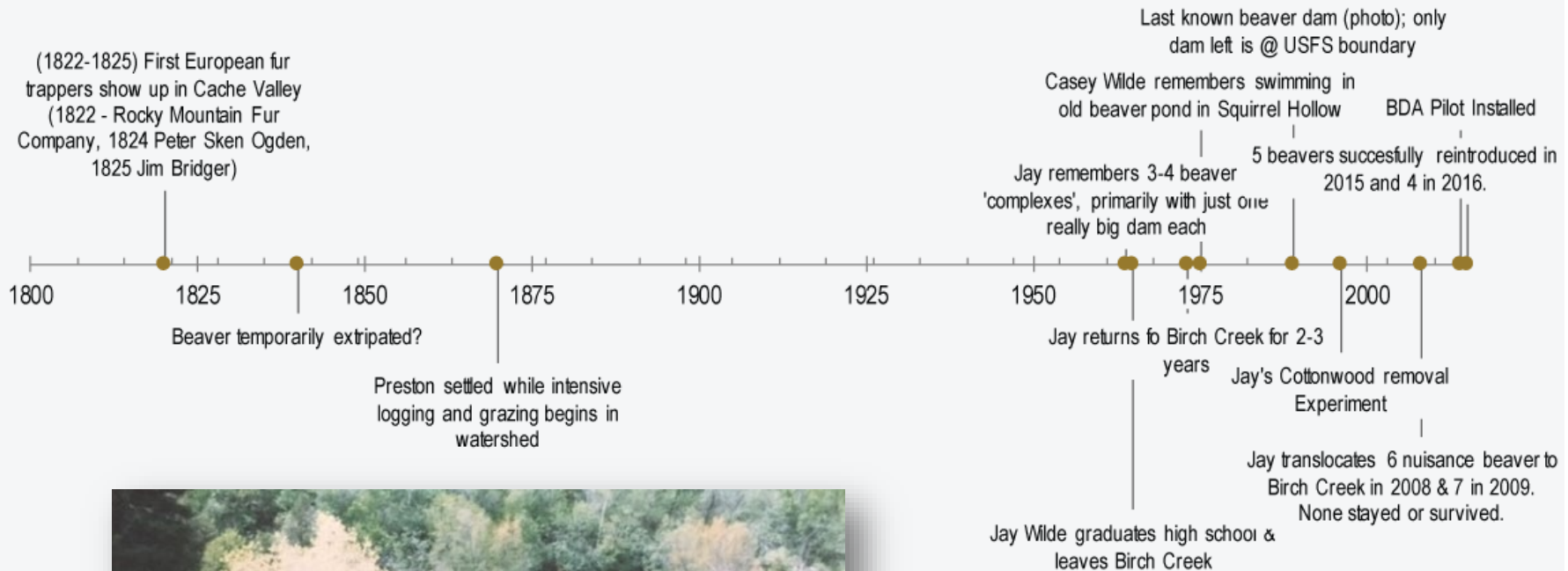
600 ft

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Birch Ck. Timeline of Beaver...



The Last Dam... & Riparian Recovery

1989



2017



In 2008 & 2009, We Brought Beaver Back



Jay's 2008 & 2009 Translocations

Six in 2008 & Seven in 2009 - All released into Mill Hollow of Birch Creek.

Legend

2008 & 2009 - Beaver Translocation Release Site

Google Earth

Image Landsat / Copernicus

© 2017 Google

2000 ft

No Go...

- Released all 13 into Mill Hollow (tributary to Birch Creek)
- Some sign of chew, no dam building
- Whether they left, died of predation or other causes is unknown

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A man wearing sunglasses and a brown jacket is kneeling in a river, holding a large silver fish. He is holding a fishing rod in his right hand. The background shows a rocky riverbank and mountains under a blue sky with some clouds.

A group of five men are standing in a field of tall grass and scattered rocks. In the background, there is a dense forest of evergreen and deciduous trees. One man on the left, wearing a dark jacket and brown pants, is gesturing with his hands while talking to the others. Another man in the center wears a dark jacket and jeans. To the right, a man in a green jacket with a logo on the sleeve and a camouflage cap is looking towards the speaker. Two other men, one in a brown vest and red cap, and another in an orange jacket, are also present. A large, light-colored rock is prominent in the foreground. The text "Kevin Parker (Ran" is overlaid on the right side of the image.

Dell Transtum
(Range Con, USFS)

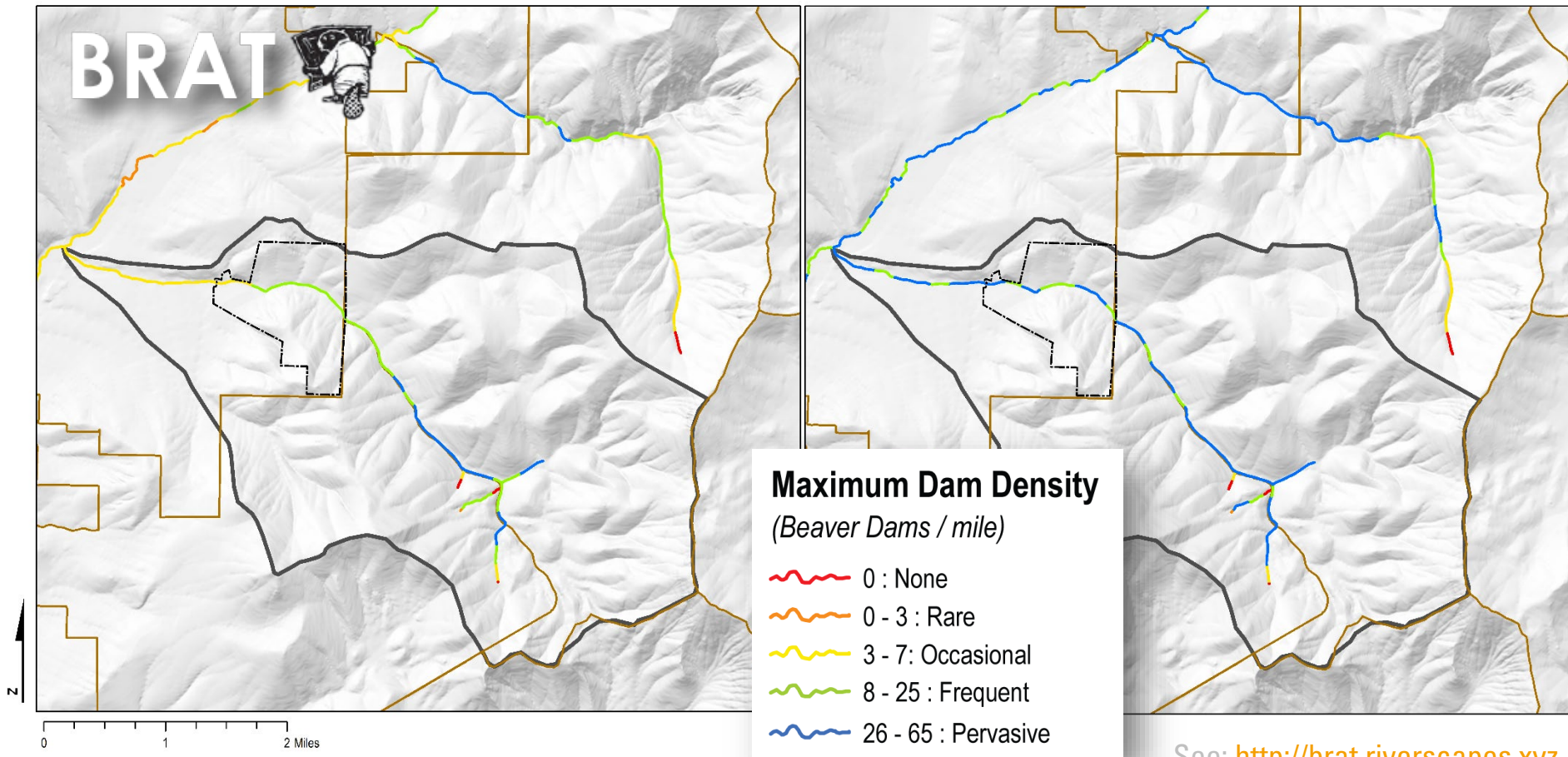
[illegible]

- All actions require permits, Brett helped cut through red tape

BRAT In Birch Creek – Good Habitat

Existing conditions vs. Historic Estimate

- Capacity of 90 dams
 - 23 dams per mile
- Capacity of 125 dams
 - 32 dams per mile



Birch Creek, Idaho

Restoring Perennial Flow

Restoration Goal

- Restore perennial flow (or make less intermittent)

Setting

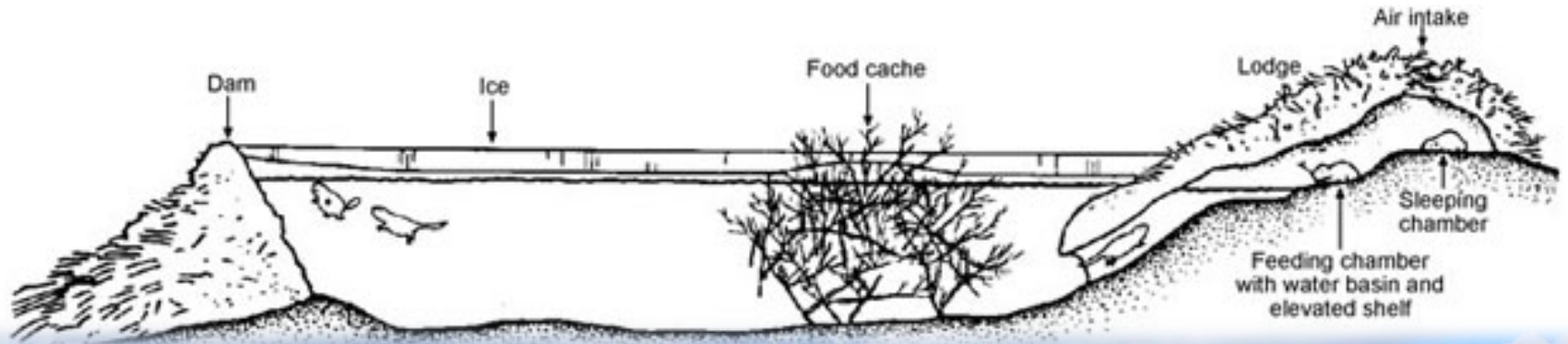
- Abundant forage for beaver
- Shallow water depth – high risk of predation
- Previously unsuccessful beaver translocation

Strategy

- Build BDAs to provide immediate habitat/refuge for beaver

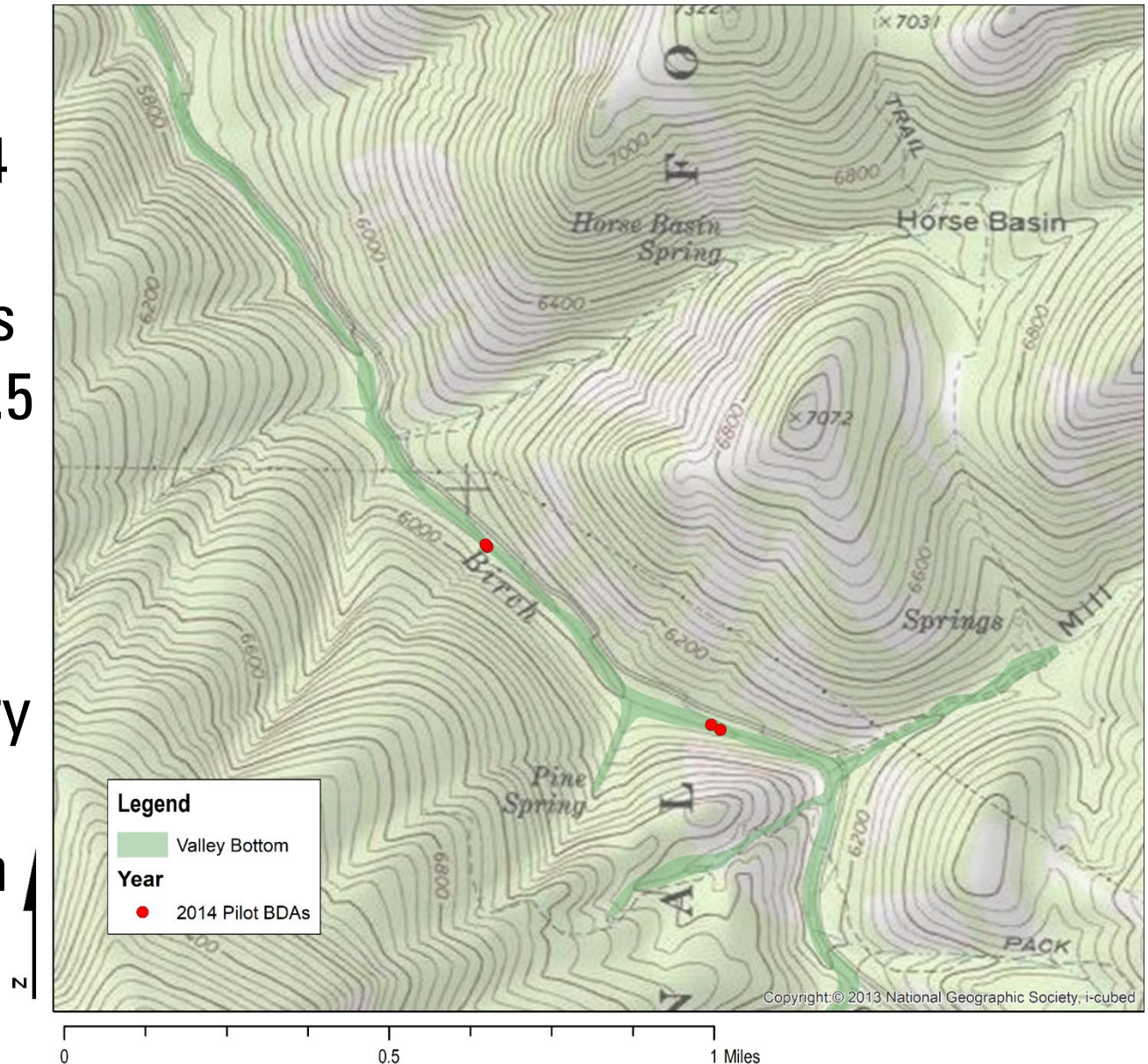


Basic Hypothesis: Beaver Should do Better if Released into Ponds with Deep Water



Build Pilot to Test Ideas

- November 2014
- Two complexes separated by 0.5 mile
- Each complex had one primary dam and one secondary dam



Pilot Construction

Build BDAs without beaver... see if we can: hold back water, keep it from freezing over winter, and hold up to spring runoff



BDA Construction

Adapted from figure 6.11 (p. 256) a of Bennett et al. (2019)

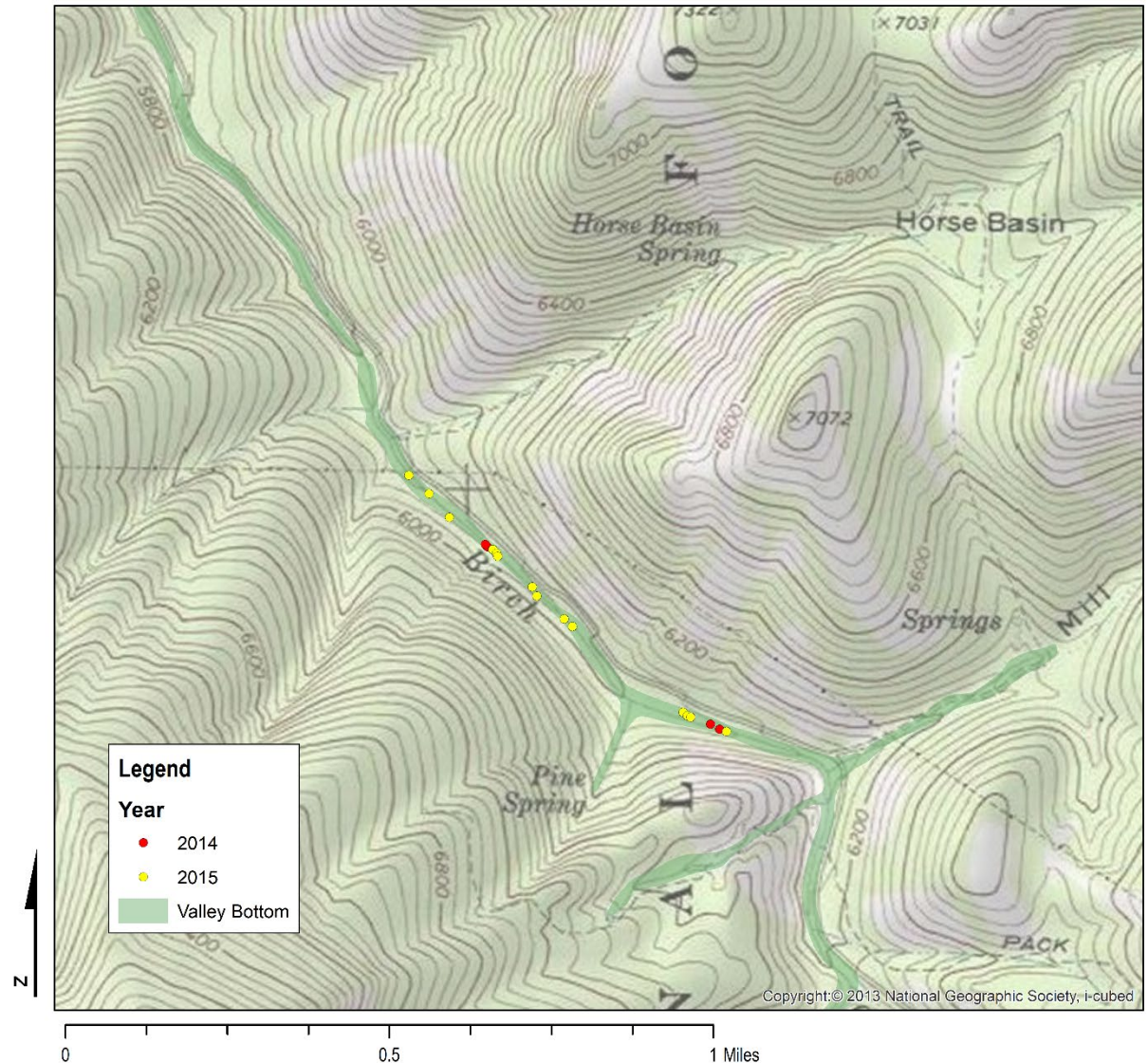
Chapter 6 of LTPBR Manual

DOI: [10.13140/RG.2.2.25043.22567](https://doi.org/10.13140/RG.2.2.25043.22567)



2015 – Build enough BDAs to give beaver choices (prior to release)

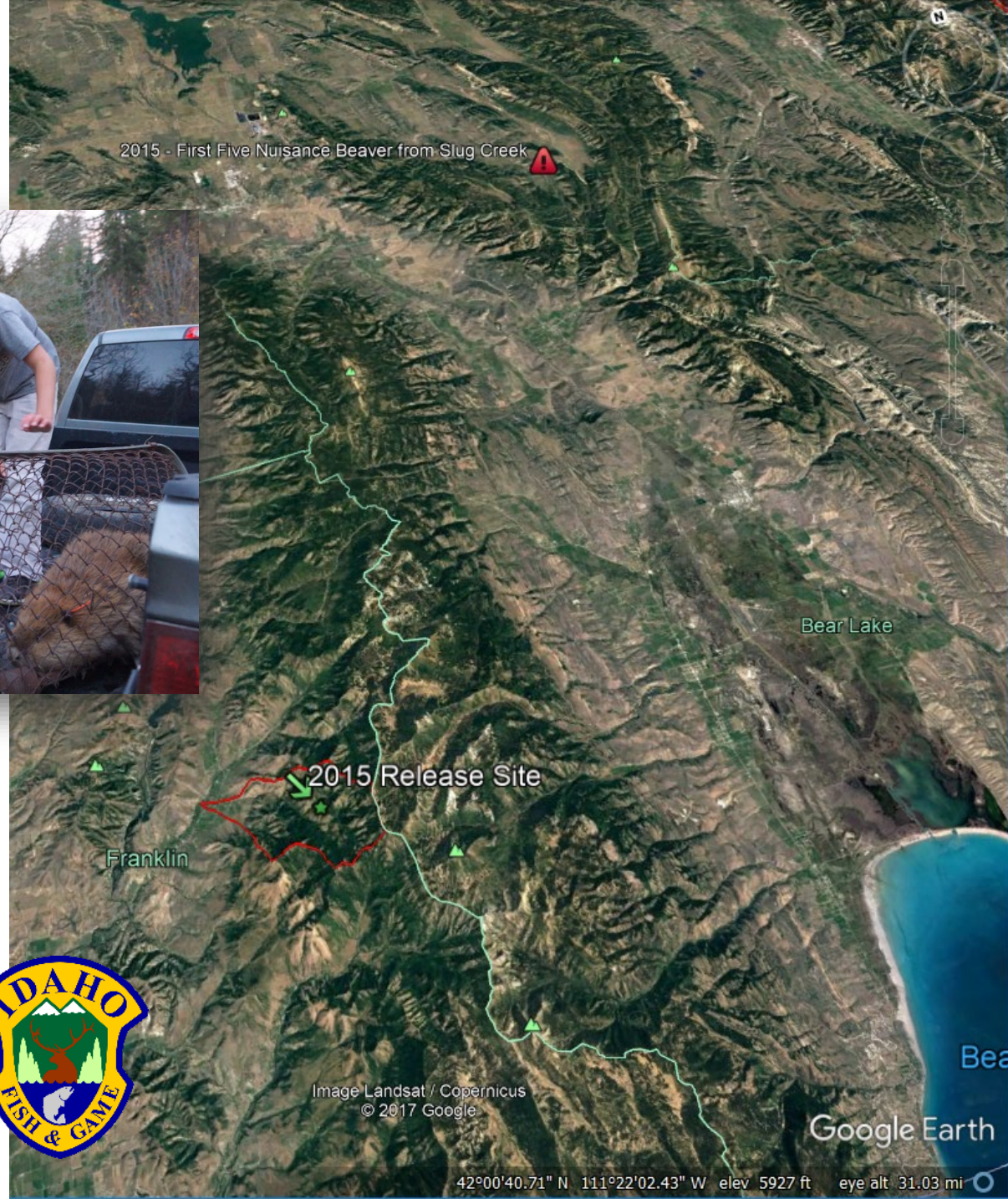
- Sept 2015
- Build 5 more complexes all on mainstem of Birch
- 15 more BDAs built (total now 19)
- Each complex had one primary dam and 1-4 secondary dams
- 3-4 days construction



2015 Release



- IDFG provides 5 nuisance beaver from Slug Creek, ID
- Released in lower pilot BDAs on Birch Creek



Beaver Release

Beavers.....
a keystone
species



Built Some More as Part of a NRCS Workshop

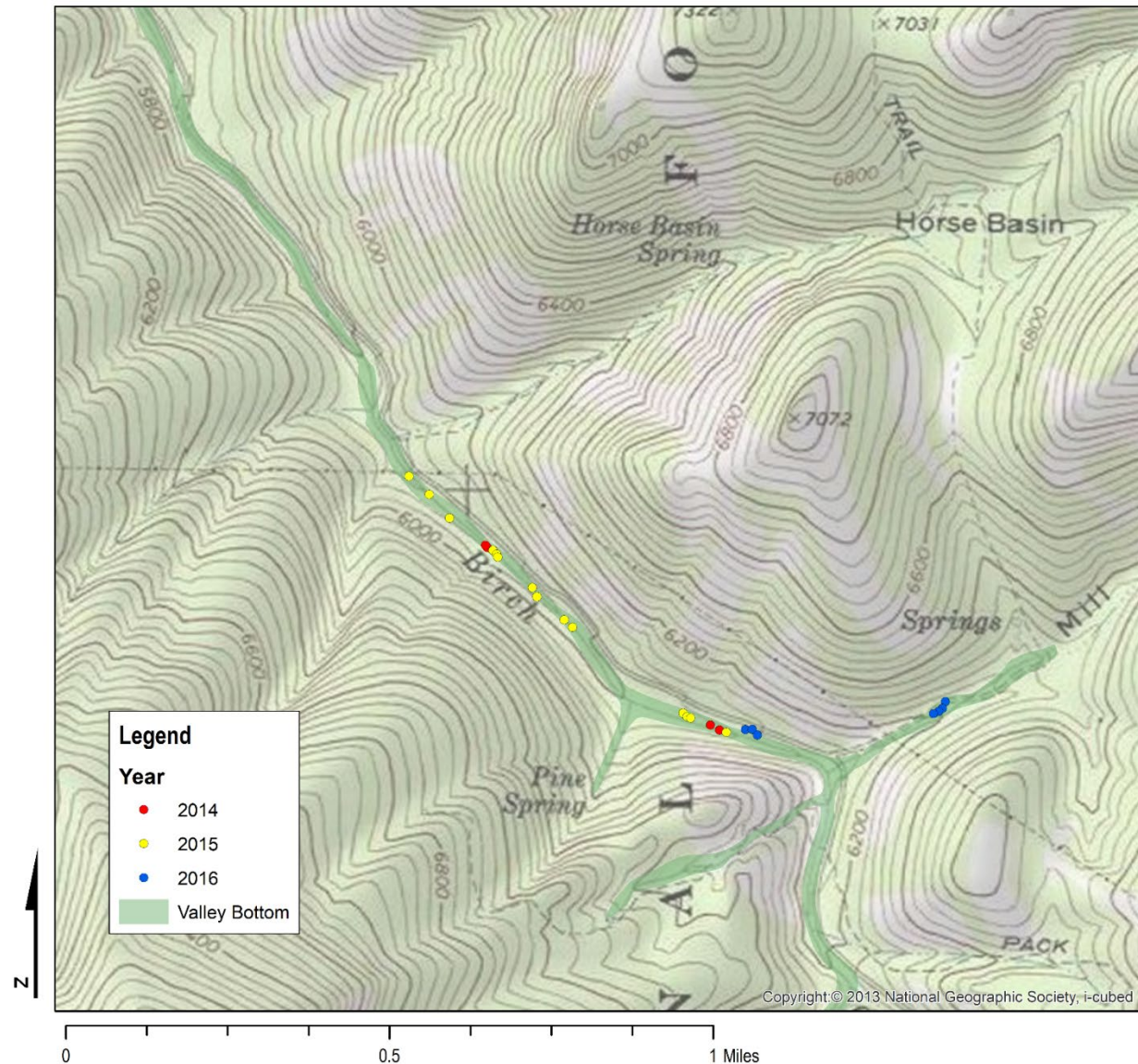


SGI/NRCS 2016 Workshop Participants working building a BDA:

<http://beaver.joewheaton.org/syllabus/workshop-schedules/2016---sage-grouse-initiative-pheasants-forever-and-nrcs>

2016 – BDAs Built by Students

- NRCS Workshop built next phase
- Built 1 more complex on Birch Creek (3 BDAs w/ posts)
- Moved into Mill Hollow, built 4 BDAs (3 originally postless)
- Total by 2016 of 25 BDAs



USFS + IDFG + USU + 3 Generations of Ranchers + NRCS CLASS



No big budget science or monitoring... but a lot of collective learning
with good will and volunteer efforts



Joe Wheaton

Not all BDAs need Posts



2016 More Beaver Release Into Mill Hollow



A Postless Example...

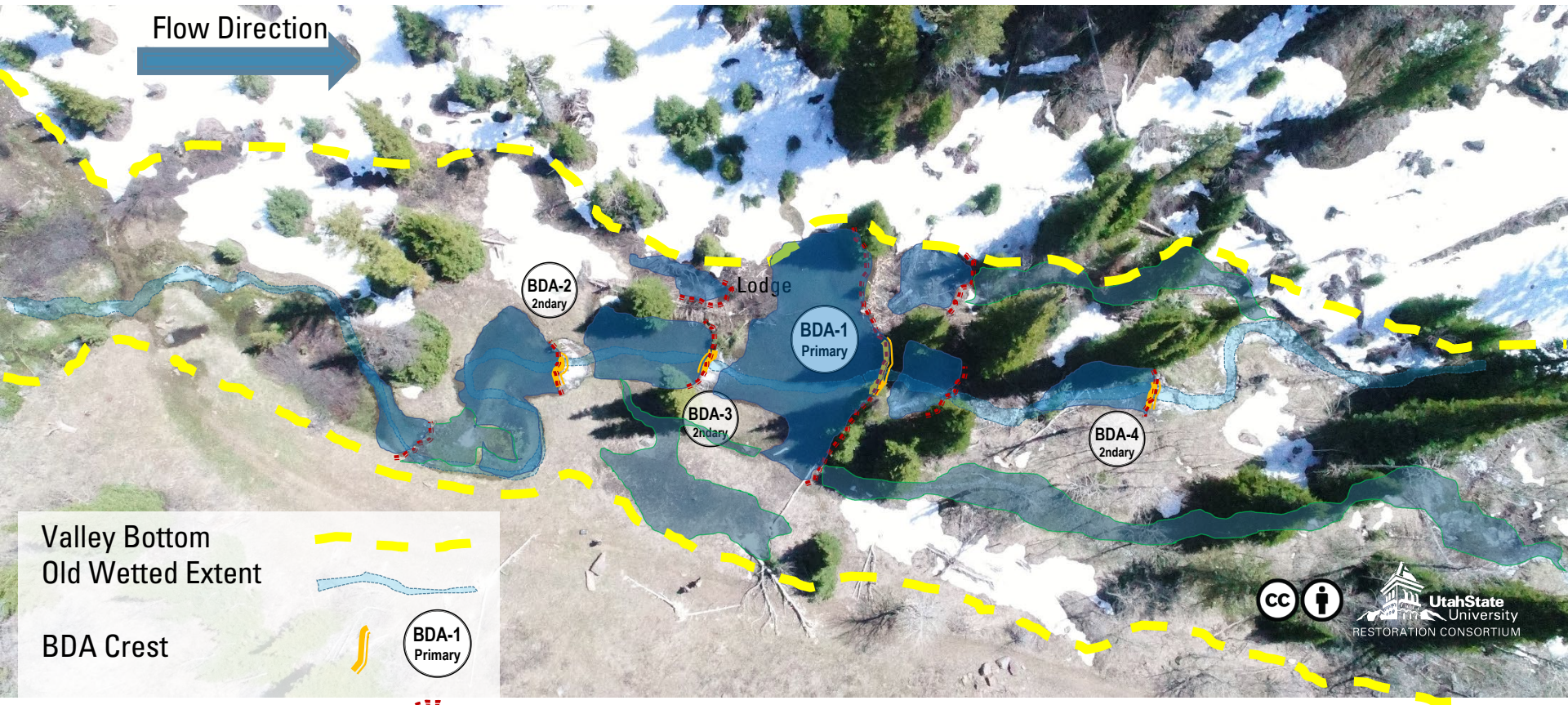


Photo from April 2017
(8 months later)

- September 2016 – NRCS Class builds 4 postless BDAs
- October 2016 – 4 more beaver introduced
- By November, they remodeled...

Rough Time Line... Birch Creek

- 1970s – Beaver Dams Present... last beaver extirpated from system
- 1990s – Jay move's back to family ranch, discovers creek now drying up (& no beaver)
- 2008 & 2009 – 2 Reintroduction attempts (13 nuisance beaver), none stayed (or survived?)
- Oct-Nov, 2014 – Jay shows interest in BDAs, we build pilot (4 BDAs – 2 complexes)
- Sep, 2015 – We build 15 more BDAs (6 complexes total)
- Oct, 2015- Reintroduce 5 beaver (4 adults; 1 kit)
- Sep, 2016 – NRCS Course & USFS maintain 3 BDAs, & build 3 new BDAs on mainstem, and experiment with 4 postless BDAs on 1st order tributary
- Oct, 2016 – 4 more beaver introduced

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- 7. Some Preliminary Results**
- 8. Wrap-Up**



cc Joe Wheaton

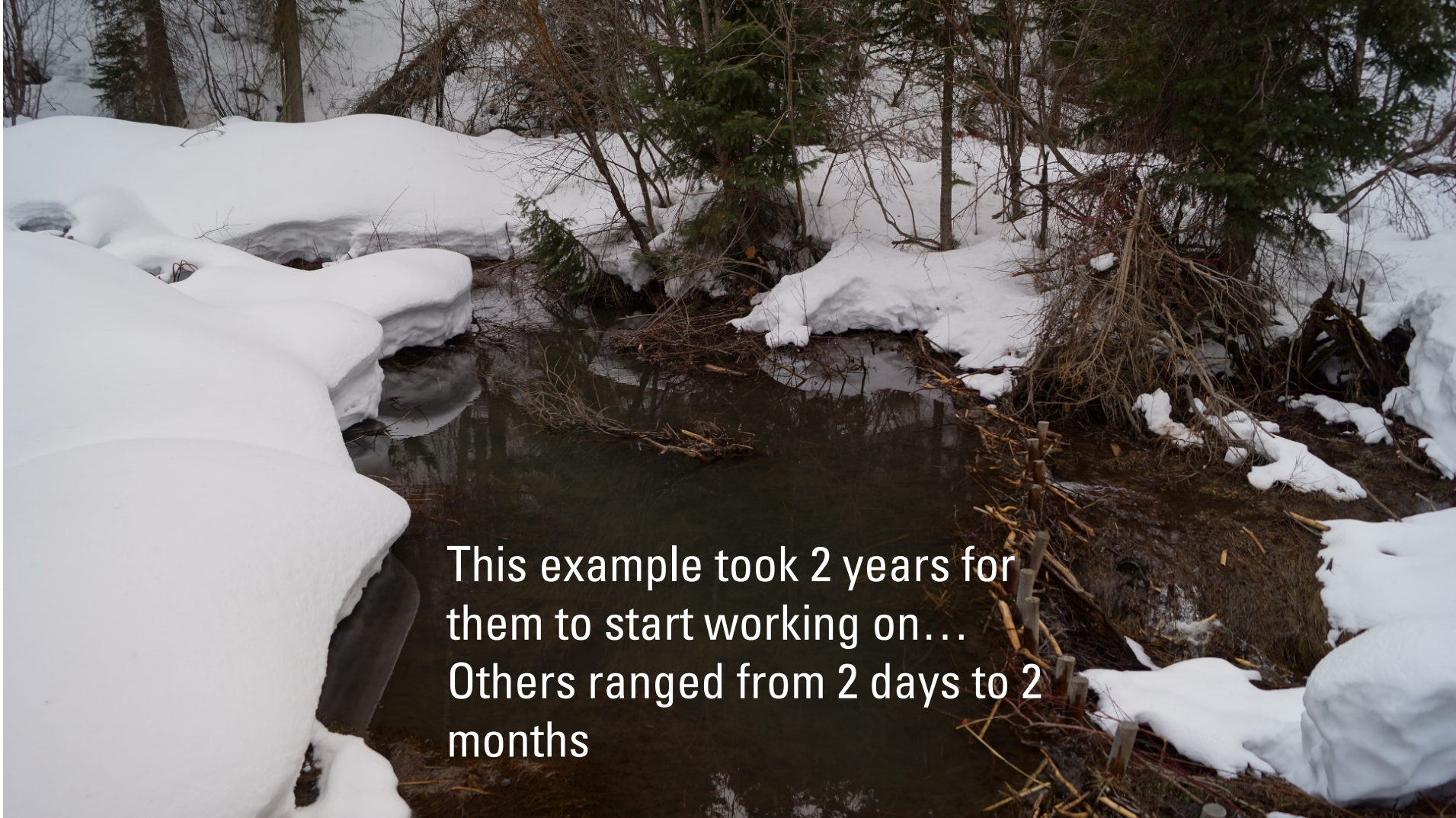
The Beavers Stuck Around

- Beaver utilized 15 of 19 BDAs in 2015
- Maintenance and dam building on 2 of 5 complexes in 2015
- Successful translocation
- Continued beaver activity



BDA flooded by natural
beaver dam built
downstream

Beaver Take Over Maintenance Of BDAs... Ideally



This example took 2 years for them to start working on...
Others ranged from 2 days to 2 months

2015

POST 2005 GRAZING MANAGEMENT

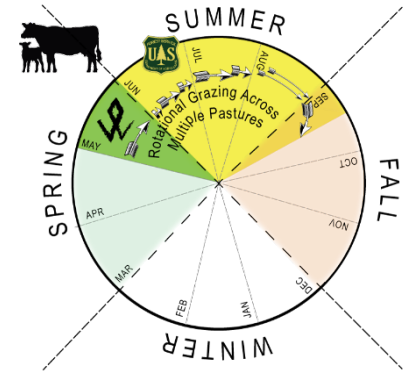


Over a decade of lighter, late season use as cows move down stream

2016



POST 2005 GRAZING MANAGEMENT



Same grazing, but another twist...

Expanded Beyond BDAs Into Meadow



Late 2016

- Starting in spring 2016, they built 1-2 complexes in meadow with 8-9 dams

cc Jay Wilde

Mid Summer 2016

2001

Beaver's Idea ... not Ours



Flow In



- Valley Bottom
- Old Wetted Extent
- New Dam Crest

3 BDA
complexes used
initially...

Flow Direction



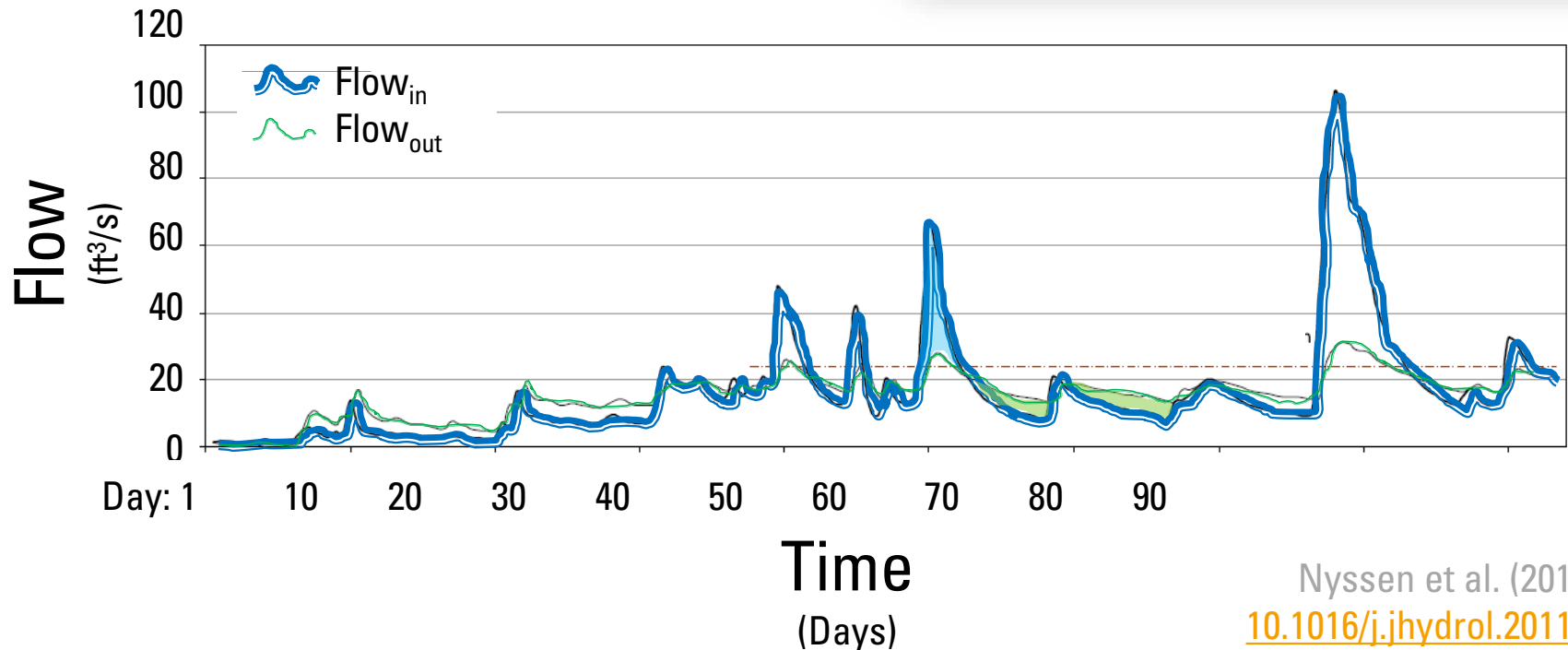
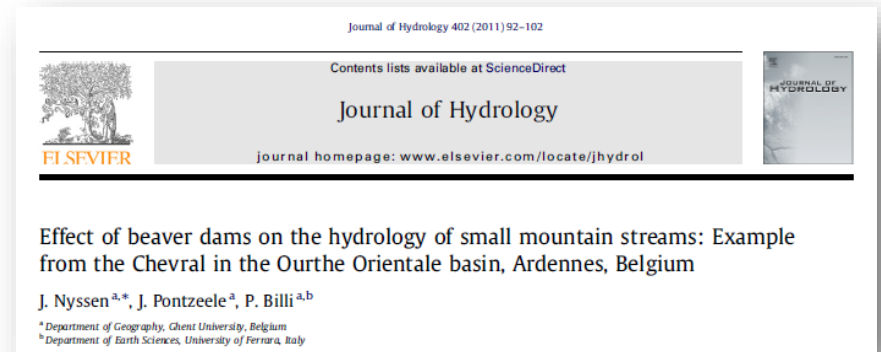
Flow Out



Utah State University
ECOGEOGRAPHY & TOPOGRAPHIC
ANALYSIS LABORATORY

Enough to Restore Perennial Flow?

- Lower peaks @ flood
- Elevated baseflow following

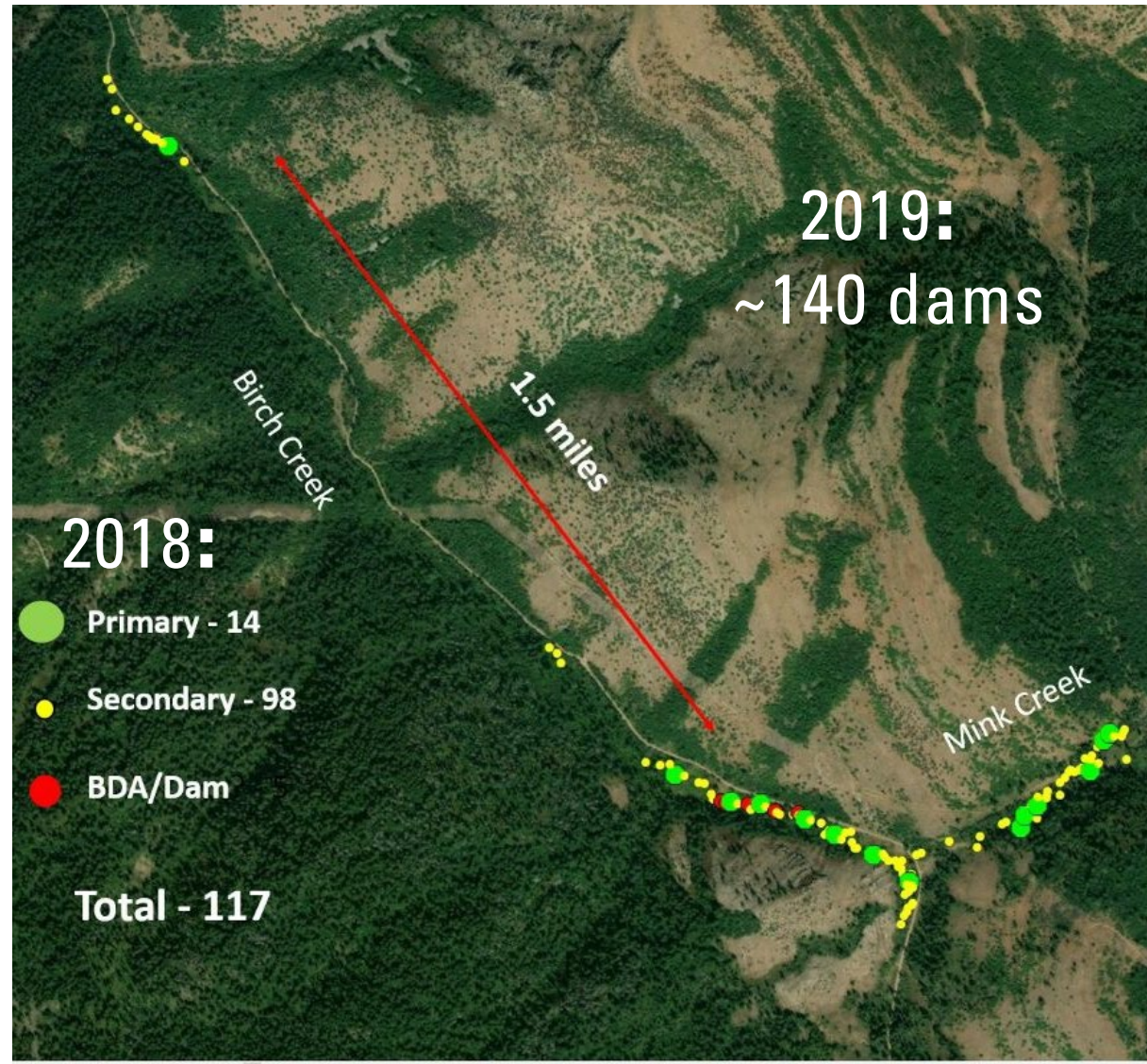


Nyssen et al. (2011) DOI:
[10.1016/j.jhydrol.2011.03.008](https://doi.org/10.1016/j.jhydrol.2011.03.008)



Since 2015...

- 9 beaver have taken up shop, and transformed the place
- Used 22 of 26 of our BDAs
- Built another 90+ dams
- Only one blow out (they repaired) from high flows of 2017
- By 2018... 117
- By 2019... 140+



Evidence Of Kits?

We don't know exactly how many beaver are there now



 **STEALTH CAM**

Summer 2016, Birch Creek



 **STEALTH CAM**

Summer 2016, Mill Hollow

2018 Kits



 **STEALTH CAM**®

09:22PM 07/09/18 73F



STEALTH CAM

Some Failures... Some Discoveries

- Can beaver ruin perfectly good hydrology experiments?
- 'Do beaver make snow cave lodges?'

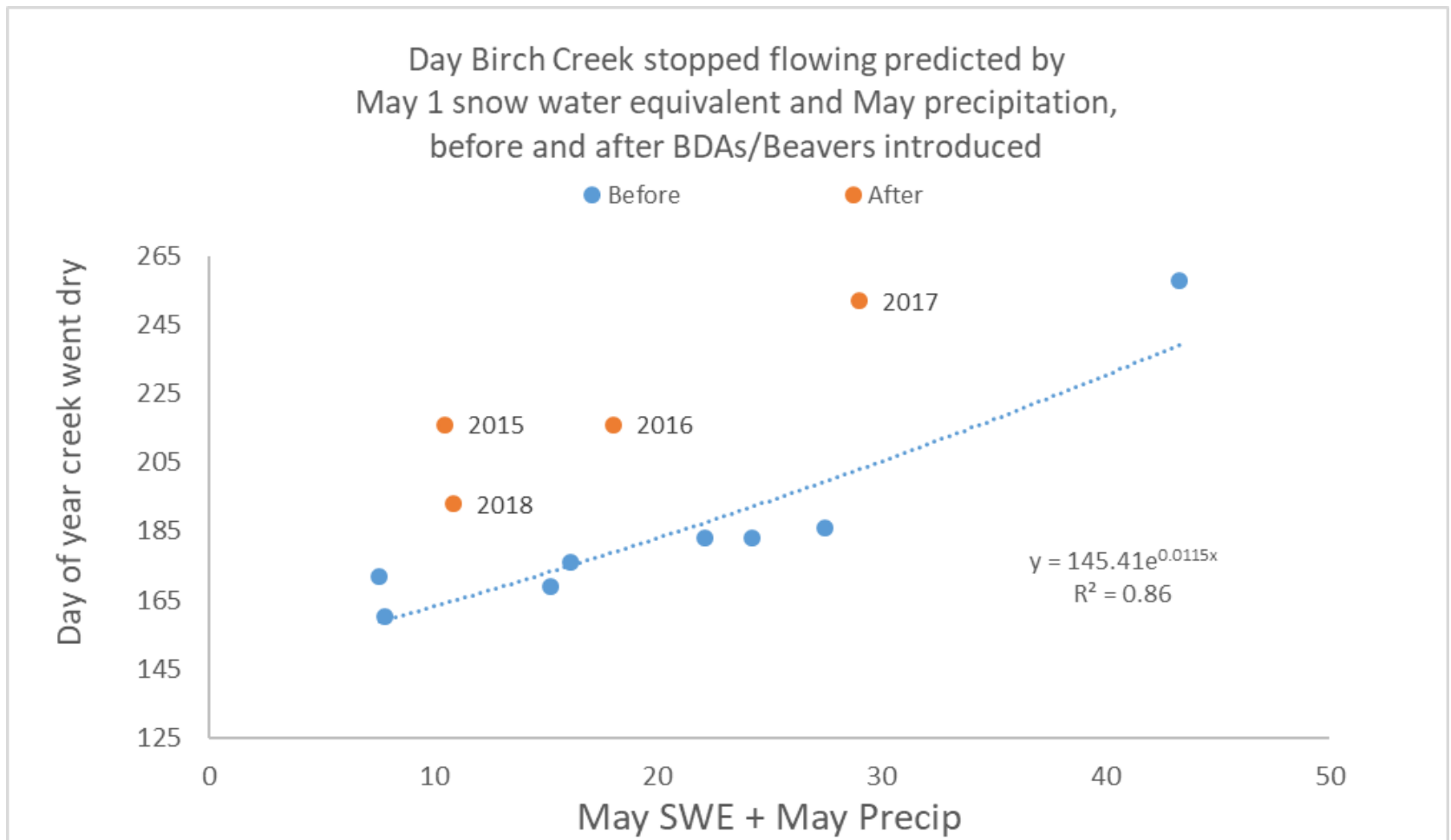


Evidence of Snow Caves?



Evidence of Snow Caves?





Birch flows on average 42 days longer since BDAs/beavers!

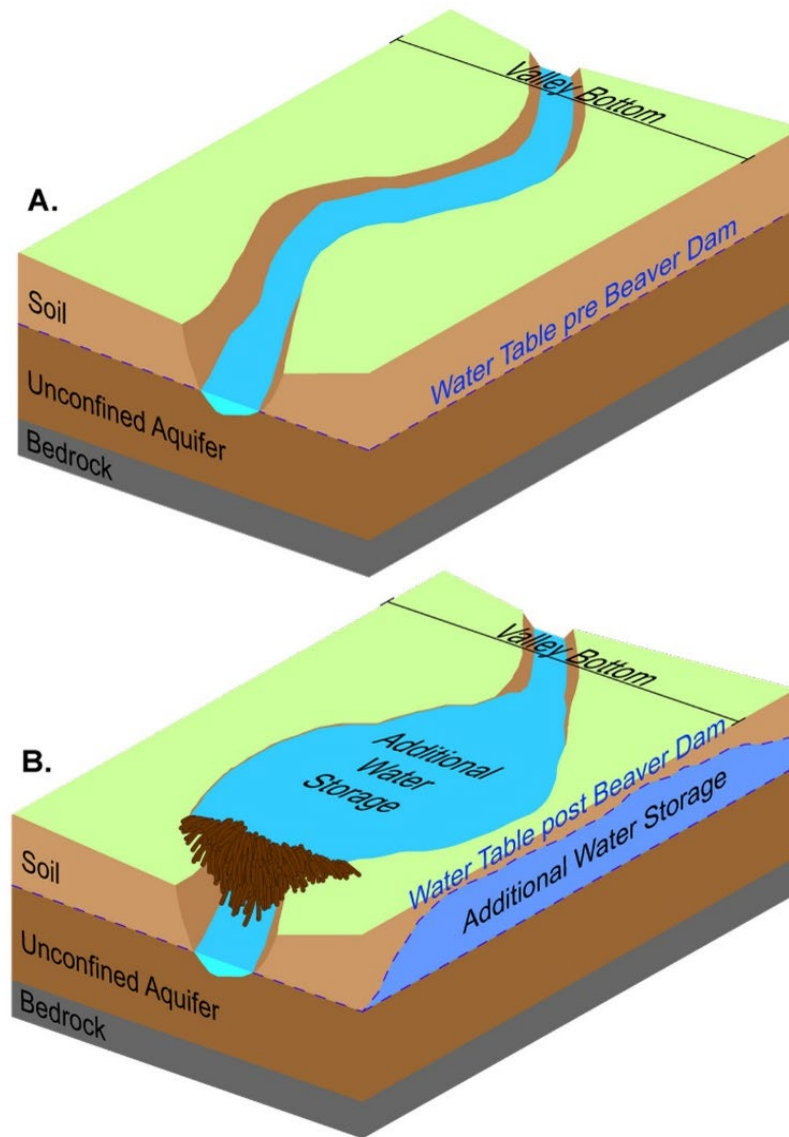
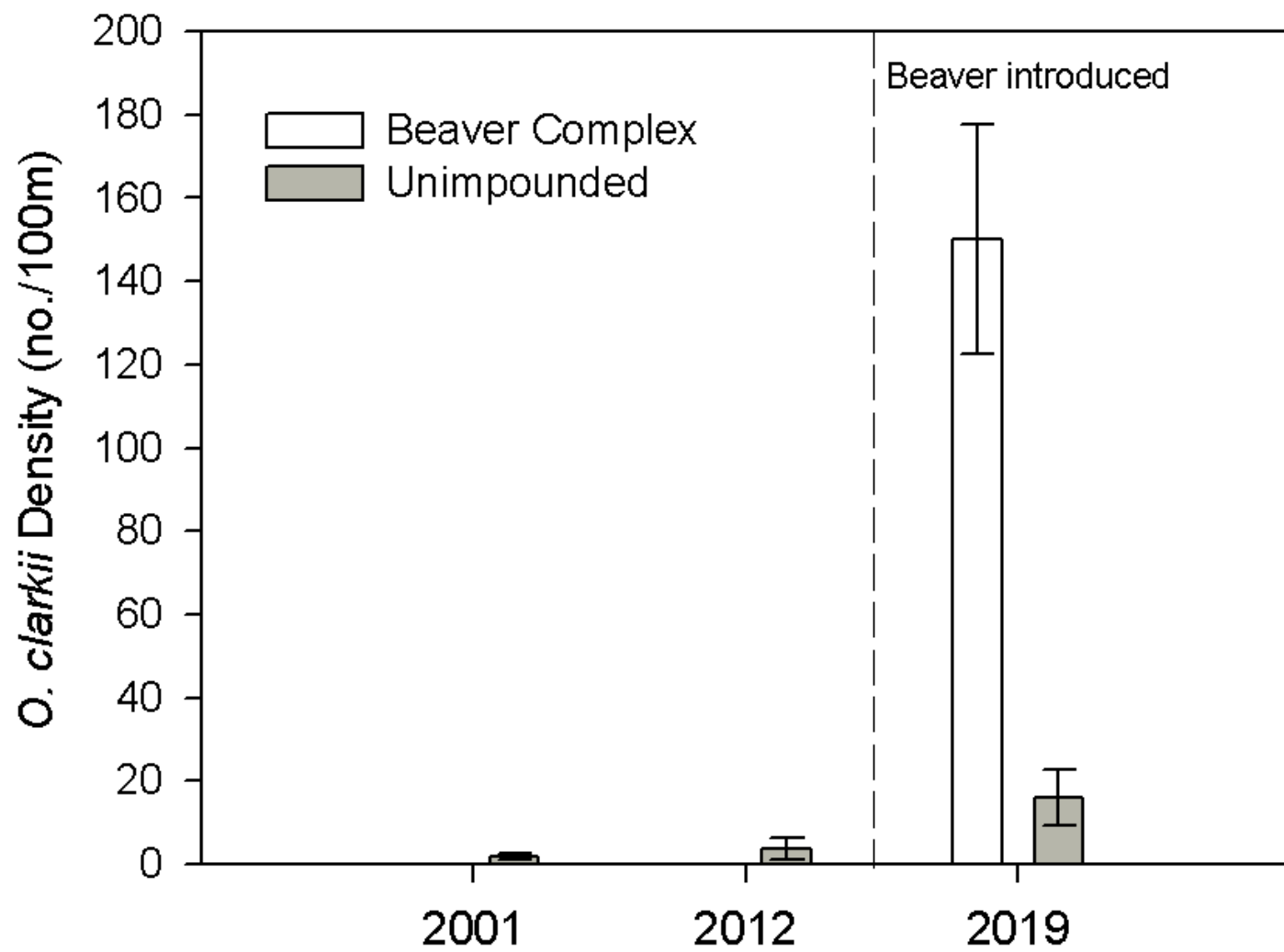


Figure 3: Conceptual illustration of water storage additions pre-beaver dam (A) and post-beaver dam (B) construction to above and below ground water storage







If you come to know and
work a patch of land...
You'll find you don't own
it.....

IT OWNS YOU

From the book THE PRARIE KEEPERS by Marcey Houle
And quoting Cressie Green

QUESTIONS?



CC Jay Wilde