Teton Basin Beaver Study

Caribou-Targhee National Forest

Partners

- Idaho Fish and Game
- Idaho Department of Environmental Quality
- Teton Soil Conservation District
- Greater Yellowstone Coordinating Committee
- Natural Resource Conservation Service

Surveying Crew

- Surveyors: Derek and Matt Blandford
- Supervisor: Lee Mabey

Project Genesis

- A watershed analysis of the area identified water quality and stream function as an issue.
- Past surveys indicated that a lack of beaver may be leading to the decline of stable functioning streams.
- Project is to determine areas where beavers would be beneficial.

Beavers a Keystone Species

- Wide flat willow bottoms have been formed over centuries as beaver dams have trapped fine sediments which have been colonized by willows.
- If beaver are removed from these systems, and there is no large material in the stream bottom, these systems can erode rapidly.
- Maintaining healthy beaver populations will safeguard stored sediment and capture more.

Goal and Objective

- Use beaver as a management tool to restore stream and hydrologic function.
- Survey all tributaries to the Teton River within the Caribou Targhee National Forest.
- Make Management recommendations based upon those findings.

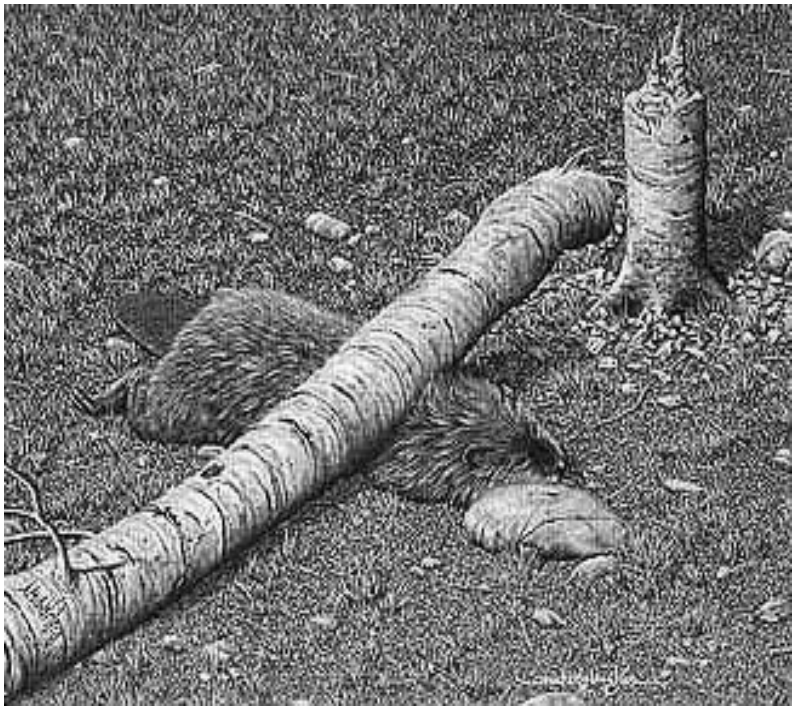
Habitat Requirements

- ½ Mile of suitable stream habitat
- Adequate willows within 100’
- Aspen within 200-300’
- Stream flow > ½ cfs
- Valley widths > 150’
- Stream gradient < 6%

Benefits of Beaver

- Elevate water tables benefiting plants
- Reduce water velocity and erosion
- Store water for release during late summer and droughts
- Can decrease flood damage

Nuisance Beavers



- Plug irrigation diversions, ditches canals, culverts and other structures
- Flood roads, trails, and other improved lands
- Overuse food supply or cut desirable trees

Methodology

- Streams were broken into half mile units using a GPS unit.
- Units were numbered starting at the forest boundary.

Methodology

- Each unit was surveyed in its entirety when possible or warranted.
- Surveys were conducted on 80 miles of streams during June to October.

Methodology

- Each stream was assessed based on social, biological, and habitat suitability parameters.

- Photos and notes on general conditions were taken.

Methodology

- Incidental measurements of temperature, large woody debris, width, bank stability, and pool frequency were recorded.

- Samples were also taken to determine the amount of inter-gravel fines relating to spawning success.

Table 1a. Streams surveyed during the beaver transplant compatibility inventory, summer 2000				
Stream Name	**Surveyed or Observed?**	**Miles Surveyed**	**# of Units Surveyed**	**Gravel Samples Taken Yes/No?**
North Moody Creek	S	6	12	Y
South Moody Creek	O	-	-	N
Moody Creek, Mainstem	O	-	-	N
Canyon Creek, N. Fk.	O	-	-	N
Canyon Creek, S. Fk.	O	-	-	N
Canyon Creek, Mainstem	S	3	6	Y
Wright Creek	S	0.5	1	N
Milk Creek	S	0.5	1	N
Packsaddle Creek, N. Fk	S	0.5	1	N
Packsaddle Creek, S. Fk	S	3	6	Y
Dude Creek	S	1	2	N
Horseshoe Creek, N. Fk	S	2	4	N
Bell Creek	S	0.5	1	N
Horseshoe Creek, S. Fk.	S	1	2	Y
Superior Creek	S	1	2	N
Horseshoe Creek, Mainstem	S	1.5	3	Y
North Twin Creek	S	0.8	2	Y
Mahogany Creek, N. Fk.	S	0.5	1	Y
Mahogany Creek, S. Fk.	S	0.5	1	Y
Mahogany Creek, Mainstem	S	1.8	4	Y
Patterson Creek	S	1.2	3	N
Grove Creek	O	-	-	N
Little Pine Creek	S	1.5	3	N
Trail Creek	S	5.5	11	Y
Mike Harris Creek	O	-	-	N
Mail Cabin Creek	S	1	2	N
Moose Creek	S	4	8	Y
Game Creek	S			Y
Darby Creek	O	-	-	Y
Teton Creek	O	-	-	Y
South Leigh Creek	O	-	-	Y
North Leigh Creek	O	-	-	Y
Badger Creek	O	-	-	Y

North Moody Creek

- Units 3-8 and 12 had past activity.
- Only unit 1 has current activity.
- Has great potential for expansion after grazing issues are resolved.

Canyon Creek

- Beaver are not abundant and stream and valley type are not conducive to beaver.
- No change is recommended for this stream.

Milk Creek

- Bank stability rating of 60%
- In the future could support beaver if the riparian area was healthy

South Fk of Packsaddle Creek

- Beaver were eradicated in this drainage circa 1988
- Units 1-3 and 6 are not prime habitat
- Unit 4 contains a inactive beaver complex
- Re-introduction of beaver into this area could stabilize and maintain current dams

Dude Creek

- Unit 2 is the site of an old beaver complex from the 60's
- Area is lacking in heavy willows, aspen are distant, and flows are limited
- This is not a priority site for introduction

South Fork Horseshoe Creek

- There is a healthy complex on Superior Creek
- South Fork has one dam which is actually a part of the Superior complex
- Recommendation: encourage expansion of current populations

North Fork Horseshoe Creek

- Suitable sites are occupied
- Stream capture needs to be repaired
- Two culverts are perched and are passage barriers (brook and cutthroat)

Main Horseshoe Creek

- Channel is entrenched 2-4 feet where dams are absent
- Units 1 and 2 are occupied but tenuous
- Unit 1 contains ¼ mile of forest and ¼ mile of private, the fence between the private and forest is in need of repair
- Unit 1 had two dams in June, in Oct there were nine

- Unit 2 has only two active dams
- Unit 3 has a series of six dams that have failed indicating a prior healthy complex
- Easy access makes this a prime area for over trapping
- Protection of this population is recommended by allowing controlled trapping

North Twin Creek

- The lower .15 miles is incised 3-4’
- There is evidence of 3 to 4 old dams
- North Twin has levels of inter-gravel sediment that are affecting spawning success (brook and Cutthroat)
- This is not prime beaver habitat and beaver would likely out migrate

Mahogany Creek

- There are 4 units with most in excellent condition
- The first ¼ mile is highly unstable due to removal of beaver and dams to facilitate water collection at the diversion
- Options need to be evaluated to divert water and still maintain channel stability

North Fork Mahogany

- Short steep section with a waterfall may discourage migration into the N Fk
- Great habitat exists
- Unstable banks may be contributing to high sediment levels downstream
- Re-introduce beaver into the North Fork

Patterson Creek

- Past beaver use was noted in units 1 and 2
- Sediment levels are high, banks are unstable, road issues need to be resolved
- Units 1 and 2 contain suitable habitat and re-introduction would be beneficial

Little Pine Creek

- Lower 330’ of unit 1 is downcut 1-4’
- The next .1 miles has a complex of 10 dams
- Unit 2 bank stability of 70-80%
- Unit 2 has a 6’ headcut, with no beaver activity
- Recommend allowing controlled trapping to allow expansion upstream

Mike Harris Creek

- Has 0.3 miles of suitable habitat
- Evidence of use but no recent activity
- This area could support one colony which could impact some dispersed camping sites
- Recommend leaving this as an expansion area for the Trail Creek Population

Trail Creek

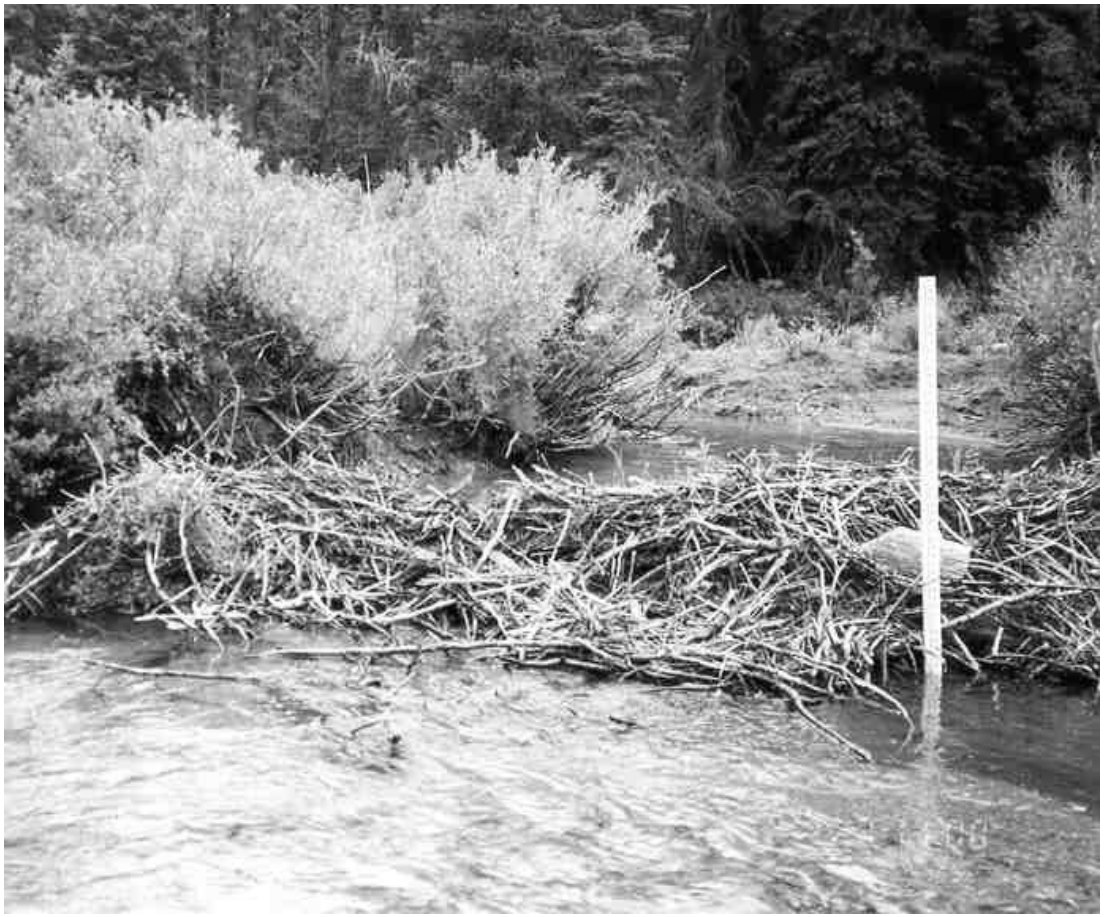
- Units 1, 4, and 6 contained active dams or food caches
- The only activity in unit 1 occurred at the irrigation diversion
- The best habitat is from Mike Harris bridge to the Trail Ck CG (units 2-5)
- Beaver recently disappeared from unit 13 as indicated by a dam with a food cache but no activity

Trail Creek Unit 1 to 3

- The down-cutting in these reaches is more the result of straightening of the river due to highway construction
- This photo is of a visible area of erosion on a meander with the opposite bank stable
- Much of the erosion in units are opposite stable banks
- There is a significant meander cutoff in Unit 3
- Unit 3 is entrenched 3’ t0 4.5’ for over a ¼ mile

Trail Creek Unit 4

- Evidence of a past beaver complex in this unit



Trail Creek Unit 4

- Large dams are capable of withstanding the high flows in this drainage

Trail Creek Unit 4

- Down-cutting of 4’ with 50% bank stability

Trail Creek Unit 5

- This site is located within the Trail Creek Campground and below
- Much of this unit has vertical banks up to 6’ on outside meanders with the opposite banks being well vegetated with an accessible floodplain
- Habitat is suitable and dams may pose a risk to some Campground developments

Trail Creek Units 6-to 13

- These units contain spotty habitat that may sustain a small colony for a short time

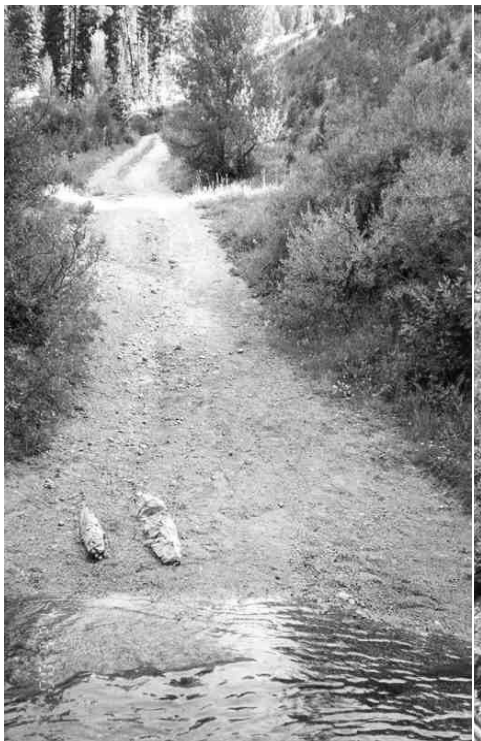
- Beaver are not crucial to the stability of these reaches except in localized areas

Trail Creek Recommendations

- This stream is readily accessible year round
- Trapping is ongoing despite lack of stable colonies
- Recommend controlling trapping and monitoring increases in number of beaver complexes to determine allowable harvests
- If numbers do not increase transplants may be necessary

Trail Creek, Road and Sediment Problems

- Significant sediment is being contributed by Wyoming State Road 22 and the Mail Cabin road



Moose Creek

- The higher reaches of Moose Creek has excellent spawning habitat

Moose Creek

- Most suitable habitat is occupied

Moose Creek

- Areas where beaver have left and dams have failed are unstable and releasing some of the stored sediments

Moose Creek

- No change in management recommended as this is a wilderness area
- Trapping not likely an issue here though beaver may have been shot out in visible areas such as Moose Meadows

Game Creek

- Most of the stream is unsuitable
- Two complexes occurred in off channel habitats
- Stream is in excellent condition
- No change in management is needed

Streams Observed but Not Surveyed

- Darby, Teton, South and North Leigh, and Badger Creeks were observed but not surveyed in detail due to lack of suitable habitat
- These streams may have localized habitat similar to Game Creek
- Grove creek was not suitable for beaver due to lack of flows and forage

Inter-gravel Sediments

- Subsurface gravel samples were taken in spawning habitat
- Samples were dried and sieved and sorted into size classes
- Particles smaller than 8mm have been shown to impeded spawning success

Inter-gravel Sediments

- Samples that had cumulative percent by weight that averaged above 25% for particles smaller than 4mm are considered spawning impaired.
- The following streams have at least a portion that are spawning impaired: Packsaddle, Horseshoe, North Twin, Mahogany, Trail, North Leigh, and Badger Creeks.

Table 1b. Streams sampled for sediment in spawning gravels, summer 2000

Stream Name	Number of Samples	Average Cumulative % by weight < 4 mm		Standard Deviation For < 4 mm
		<4 mm	<8 mm	
North Moody Creek, 5.5 miles above Forest Boundary	6	17	31	10
Canyon Creek, Mainstem	6	20	36	8
Packsaddle Creek, S. Fk	6	29	44	6
Horseshoe Creek, S. Fk.	6	26	39	6
Horseshoe Creek, Mainstem	6	20	30	8
North Twin Creek	6	31	44	6
Mahogany Creek, N. Fk.	3	29	43	5
Mahogany Creek, S. Fk.	3	16	29	8
Mahogany Creek, above trailhead	6	27	46	7
Mahogany Creek, at Forest boundary	6	29	44	7
Trail Creek, at Coal Creek	6	30	42	10
Trail Creek, above Mike Harris	6	23	37	7
Moose Creek, Trailhead	2	25	39	8
Game Creek	6	15	27	10
Darby Creek, above trailhead	6	20	31	13
Darby Creek, above Forest Boundary	6	12	23	11
Teton Creek, above Campground	6	15	23	7
Teton Creek, above Forest Boundary	6	25	38	11
South Leigh Creek, above trailhead	6	22	33	11
South Leigh Creek, above Forest Boundary	6	18	27	7
North Leigh Creek, above trailhead	6	21	34	7
North Leigh Creek, below trailhead	6	27	38	5
Badger Creek,	6	26	35	8

Conclusions

- This project was initiated because of concerns about deteriorating channel and riparian conditions, water quality and sediment

- Areas were found where a lack of beaver has led to a decline in the above parameters

Conclusions

- The most economical way or only way to prevent further erosion in these areas is to allow the processes that formed these areas to continue.

- Streams that could be improved by better Beaver management include: North Moody, South Packsaddle, Horseshoe, Mahogany, Patterson, Little Pine, and Trail Creeks.

Recommendations

- Along with partners determine what options we would like to explore to improve conditions
- Some streams need transplants and others would benefit from protection so existing populations could expand
- In other areas the Idaho Fish and Game have established controlled trapping areas where they regulate harvest numbers