WHERE? PICKING THE RIGHT PLACES TO WORK

SGI / NRCS Workshop
July 18-19, 2018
Cedar City, UT
MASSIVE ENTHUSIASM FOR BEAVER RESTORATION ... BUT

• How do we temper that enthusiasm constructively?
• How do we provide more realistic expectation management?
• Where can it work?
Resolves **where** and at **what level** (within a drainage network) **beaver dams** can be built and sustained.

**BRAT** (Beaver Restoration Assessment Tool) is all about **how many** of these:

Not how many of these:

---

**Macfarlane et al.** (2016) **DOI:** 10.1016/j.geomorph.2015.11.019
• Beaver dams, not beaver themselves, provide the positive feedbacks we seek

• While beaver can survive in a wide range of conditions, where they build dams is more limited

• Dam building activity varies dramatically according to flow regime & availability of dam building materials
FOR PLANNING & SITE ‘SUITABILITY’

We ask four basic questions to develop expectations about dam building capacity:
1. Is there a perennial source of water?
2. Are the woody vegetation resources available to support dam building activity?
3. Can beaver even build a dam at base flows?
4. If beaver do build a dam, what is the likelihood that those dams will withstand typical floods?
You guys did this!
You answered those basic questions... and did the inference system
With the actual model, we approximate quantitative answers to those with GIS data
BRAT OUTPUTS IN A NUTSHELL

- Existing & Historic Capacities → Potential Conflict → Management

**Existing Beaver Dam Capacity**

- Actual Beaver Dams
- Maximum Dam Density (dams/km):
  - 0 - None
  - 0 - 1 Rare
  - 1 - 4 Occasional
  - 5 - 15 Frequent
  - 16 - 40 Pervasive

**Potential for Human Beaver Conflict**

- Probability of Conflict:
  - 0 - 10%
  - 10 - 25%
  - 25 - 50%
  - 50 - 75%
  - > 75%

**Ecosystem Management**

- Beaver Management Zones:
  - Unsuitable: Naturally Limited
  - Unsuitable: Anthropogenically Limited
  - Quick Return Restoration Zone
  - Low Hanging Fruit
  - Living with Beaver (Low Source)
  - Living with Beaver (High Source)

**Map Key**

- Scale: 0 0.5 1 1.5 2 Kilometers
HOW MANY & WHERE?

- Existing capacity: 356,294 dams
- 8.3 dams/km

Note: Utah is second driest state in US

From Macfarlane et al. (2016) DOI: 10.1016/j.geomorph.2015.11.019
UTAH – BEAVER MANAGEMENT PLAN

• One of most progressive plans in US
• Recognizes beaver as fur-bearer & a nuisance
• Specifically relies on beaver as a restoration tool

UTAH BEAVER MANAGEMENT PLAN
2010 – 2020

Plan Goal
Maintain healthy, functional beaver populations in ecological balance with available habitat, human needs, and associated species.

INTRODUCTION
The purpose of the Utah Beaver Management Plan is to provide direction for management of American beaver (Castor canadensis) in Utah and where appropriate expand the current distribution to historic range. This purpose is in accordance with the mission statement of the Utah Division of Wildlife Resources (UDWR). The mission of UDWR is:

To serve the people of Utah as trustee and guardian of the state’s wildlife

• Just updated to use BRAT ….
WE’LL SEE ANOTHER BIRCH CREEK...

BIRCH CREEK RESTORATION DESIGN REPORT

PREPARED FOR THE UTAH DIVISION OF WILDLIFE RESOURCES AND BUREAU OF LAND MANAGEMENT

Figure 7 - Restoration structure types and locations along Birch Creek.

LOGISTIC CONSIDERATIONS

Our restoration design was intended to maximize our restoration footprint (i.e., the number of structures built) during a one-week construction window. As such, we sourced all our materials (save, untreated wooden posts supplied by the BLM) within 50 m of each structure. This negated the need to import materials from off-site, saving time and money. Previous juniper removal (as part of Phase I of the WRI
Joint BLM/UDWR Utah Watershed Restoration Initiative Project
Justin Jimenez, (BLM) Dan Fletcher (BLM), Stan Beckstrom (UDWR),
Wally Macfarlane (USU), Scott Shahverdian (Anabanchor Solutions)
AN ATTEMPT TO PLAN REALISTICALLY

• Where makes sense, where does not?
• Model capacity to support beaver dams as well as conflict potential
• BRAT: http://brat.joehwheaton.org

Macfarlane et al. (2016) DOI: 10.1016/j.geomorph.2015.11.019
Based on current conditions, where could beaver be supported now?
3. HUMAN-BEAVER CONFLICT POTENTIAL

Where could beaver cause problems?
SIMPLISTIC & CONSERVATIVE

- How far is the waterbody from:
  - Roads
  - Railroads
  - Crossings
  - Canals

- Closer.. Higher probability of conflict

- Not accounting for beaver activity or tolerance
How and where to prioritize restoration & conservation actions?
PROVISOINAL MANAGEMENT MODEL

• Attempting to differentiate
  – Low hanging fruit
  – Longer-term investment
  – Unsuitable for beaver
1. VALLEY BOTTOM (RIPARIAN) DELINEATION

Sets maximum lateral extent for potential riparian & flooding

From http://rcat.riverscapes.xyz
2. RIPARIAN VEGETATION DEPARTURE (RVD)

What % of riparian vegetation has been lost in valley bottom?

- From http://rcat.riverscapes.xyz
3. RIPARIAN VEGETATION CONVERSION TYPE (RVCT)

If losses, what’s the cause?

- From [http://rcat.riverscapes.xyz](http://rcat.riverscapes.xyz)
SO WHERE WOULD YOU WORK?

• What are you trying to do?
• What impairments are you trying to address?
• What uplift or improve (e.g. in quantity of mesic habitat) are you trying to get?
• What risks to be aware of, mitigate and/or avoid?