Alteration to riverscapes is pervasive. It is estimated that 79% of riverscapes in the contiguous US have been altered by human activity. Even with more than $10 billion spent annually, traditional stream restoration efforts are barely scratching the surface of what could be restored. Through their dam building activity, beaver can improve habitat quality and complexity and maintain dynamic, healthy riverscapes. Plus, they do it for free.

**BEAVER RESTORATION ASSESSMENT TOOL**

The ecogeomorphic benefits and impacts of beaver dam building activity are well understood, but predicting where beaver will likely build dams is critical to using beaver in a restoration context.

Beaver are broadly appreciated for their utility as an ecosystem engineer capable of restoring streams, rivers, and wetlands to the benefit of numerous flora and fauna, including salmon and steelhead (Bouwes et al. 2016). From a restoration perspective, we primarily care about where beaver are able to build dams that persist. In this context, we can focus on the conditions beaver need to build dams.

**APPROACH**

Five lines of evidence are used to consider whether beaver could build dams:
- Availability of water to support beaver ponds
- Availability/extent of woody building materials
- Ability of beaver to build dams at baseflow
- Likelihood of dams to withstand high flows
- Likelihood that a stream is small enough to dam

The inputs to the capacity model (Figure 1) can be readily derived from nationally available DEMs, vegetation and hydrological data. These factors are combined in a fuzzy inference system to predict an upper limit of dam density (in terms of dams per mile/km) that the riverscape could support.

**BACKGROUND**

Figure 2. A schematic of the five inputs to the beaver dam capacity model.
Figure 2 shows some of the primary outputs of the BRAT model in Little Wood watershed, Idaho. These outputs help stakeholders understand patterns of beaver dam capacity, potential risks to human infrastructure, and constraints and opportunities for using beaver in restoration and conservation. This information helps with broad-scale planning efforts, as well as design and implementation of conservation and restoration activities.

THE TAKEAWAY

BRAT's beaver dam capacity model compares favorably to actual dam distributions, even across a large, climatically and physiographically diverse landscapes where water and/or wood may be locally limiting.

BRAT helps assess where beaver may be a viable restoration tool or where they may be seen as a nuisance requiring mitigation or relocation.

CITATIONS
