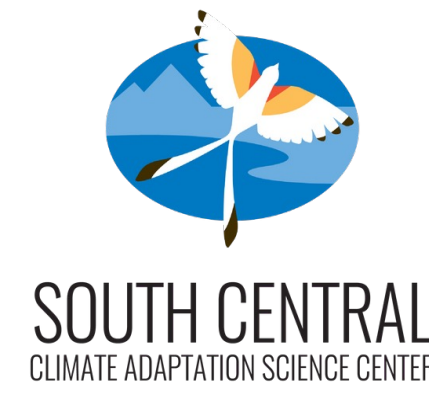
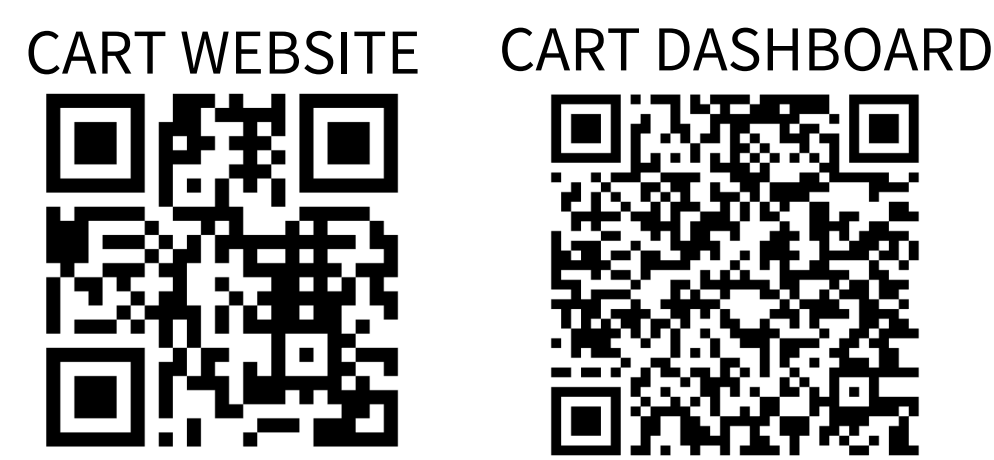


# The Conservation and Adaptation Resources Toolbox (CART): A Knowledge Sharing Platform to Support Landscape-Scale Partnerships for Ecosystem Restoration

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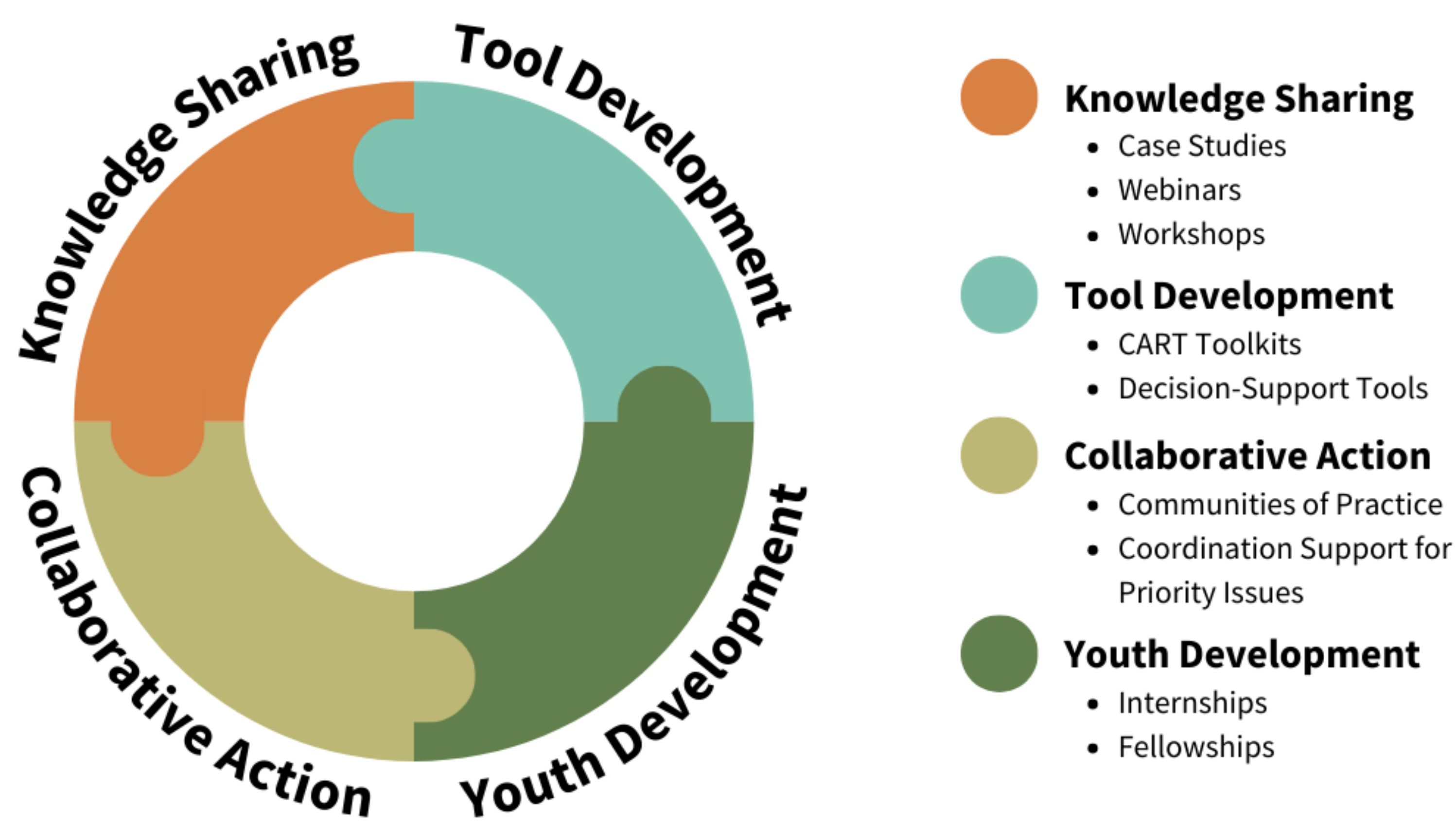
**CART enhances collaborative conservation efforts at all scales by facilitating issue-based, not geography-based, peer-to-peer knowledge sharing.**

## CART's Purpose

Managers expressed a need for increased coordination around key conservation challenges and a better way to communicate lessons learned from on-the-ground project management.

In 2017, the U.S. Fish and Wildlife Service and Bureau of Reclamation launched CART to support peer-to-peer knowledge sharing.

## How CART Meets Manager Needs



## Example Priority Issue: Grassland Restoration



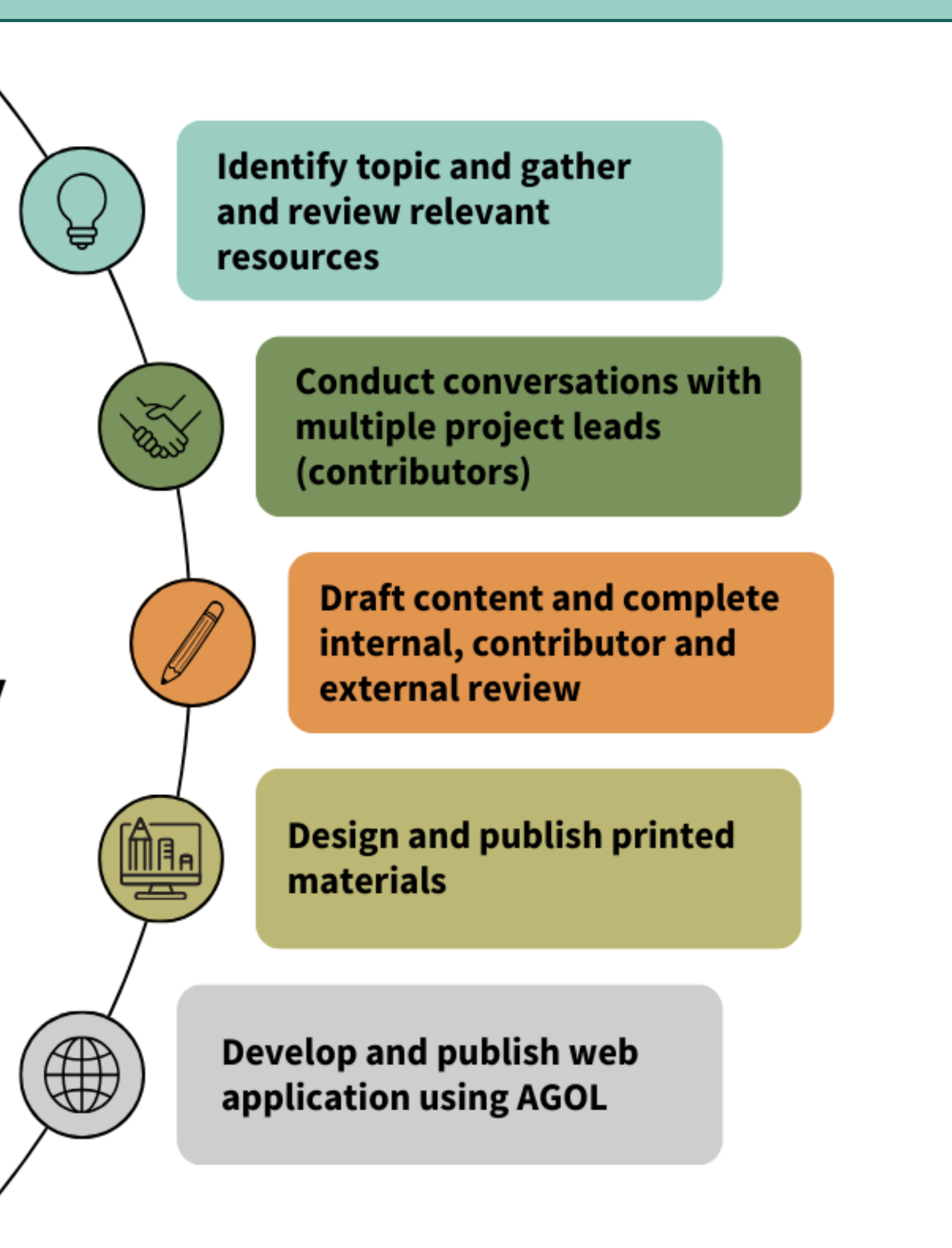
## CART Focus Areas

- ❖ Fire and Climate Adaptation
- ❖ At-Risk Species
- ❖ Non-Native Aquatic Species
- ❖ Grassland Restoration
- ❖ Drought Adaptation
- ❖ Aquatic Restoration
- ❖ Nature-Based Solutions

## Youth Development

- ❖ Supported over 50 students from 23 universities
- ❖ Students have written over 130 of the 200+ CART Case Studies

## Case Study Process (2-4 months)



**RESTORATION**  
Bird Track Springs Habitat Restoration on the Upper Grande Ronde River

**KEY ISSUES ADDRESSED**  
Hydroelectric projects on the Snake and Columbia Rivers and severe habitat degradation in the tributaries have dramatically decreased populations of salmonid species throughout the Pacific Northwest. In the Upper Grande Ronde, beaver trapping, logging, grazing, river channelization, and construction have resulted in a channelized, disconnected river. Climate change and especially extreme water temperature fluctuations exacerbate inadequate habitat in the single thread channel. Previous restoration projects that introduced woody debris and other hydrologic structures did not achieve needed results due to smaller-scale actions.

**PROJECT GOALS**

- Enhance river complexity by reconnecting floodplain and side channels and adding large wood deposits to create a long-term, self-sustaining river wetland corridor
- Use the reconnected floodplain as a nature-based solution to improve quality and quantity of suitable habitat for target salmonid species at all life stages
- Reinvigorate native plant communities along stream banks and across the floodplain

**BEYOND SALMONIDS**  
The habitat improvement benefitted a variety of freshwater species, including resident trout, Pacific lamprey, whitefish, and freshwater mussels, all important to the GTR.

**LESSONS LEARNED**  
Scale matters in salmonid recovery projects because fish need immediate results to impact their population declines. Previous projects attempted in the area were not as successful because they did not fully reconnect river-floodplain processes that sustain dynamic habitat conditions required by salmonids. Contractor collaboration during restoration design implementation was key to successful project completion. Estimating quantities in large-scale river restoration projects is difficult. Balancing earthwork cut/fill volumes with on-the-ground discrepancies resulted in a lack of material to fill/narrow the existing channel. Designers changed the project grading in several areas to compensate. Source woody material is irregular, so it can be hard to meet design parameters in practice. At BTS, this led to an excess of woody material after the in-channel features were built. Natural infrastructure such as low-tech wood structures and bank protection features would have allowed for more flexibility in adjusting to conditions on the ground. However, the new channels stayed intact through large flood events in 2020 and 2022.

**PROJECT HIGHLIGHTS**  
**Right Place for Restoration:** Using the Restoration Atlas, a centralized database of project sites in the Grande Ronde Watershed, partners prioritized Bird Track Springs for restoration because of its flow through a wide unconfined valley, offering a variety of complex habitat options. **Developing the Design:** The design team used field surveys, geomorphic assessments, LIDAR imaging, and local knowledge of habitat types to determine what landscape-scale alterations to implement. Reclamation engineers used Auto-CAD CIVIL 3-D and hydraulic modeling to create a proposed conditions model that would achieve floodplain inundation, channel flow partitioning, and improved hydraulic habitat conditions. **On-the-Ground Construction:** The project team implemented the restoration design in 2018-2019. The contractor re-shaped the river's path with approximately 5,000 feet of new main channels and 10,000 feet of new side channels. The project also re-connected approximately 150 acres of floodplain to the river. They installed river features to include riffles for vertical grade control and wood structures to provide initial horizontal stability along with complex habitat for fish. 15,000 native trees and shrubs were planted as part of the revegetation post-construction.

**Collaborators**

- Grande Ronde Model Watershed
- See online for full list of collaborators

**CART Author:** Lindsey Smith, Miami University, August 2023.  
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**Visit CART!**  
For more information on this project, contact Reclamation's Public Affairs Office: [info@usbr.gov](mailto:info@usbr.gov)