

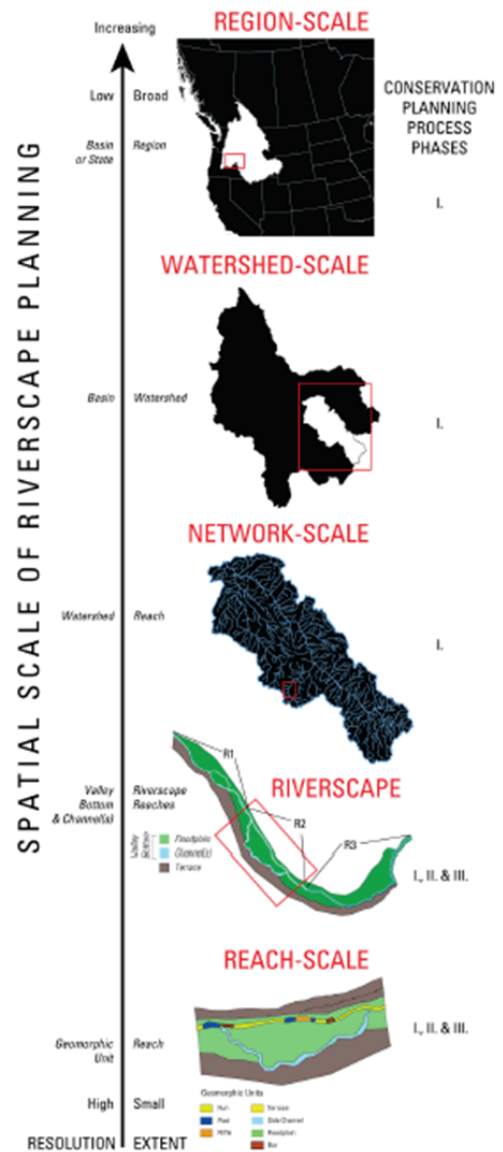


Using Riverscapes Tools & Models for LTPBR

Quick Start Guide

Different Riverscapes Consortium (RC) products are designed to be applied at the different spatial scales of planning. Planning at the regional/watershed scale involves workflows that help to identify where, within a greater landscape, restoration actions might be most effectively applied. Project (or site, or reach) scale planning involves answering various questions pertinent to restoration at a given site. These include things like assessment of existing conditions and recovery potential, inventory of existing resources, assessment of risk, logistical constraints, and other practical considerations.

This is a sample workflow of using RC applications, models & tools to prioritize, plan and implement Low-Tech Process-Based Restoration (LTPBR). This document is intended to be a 'Quick Start Guide'. As users familiarize themselves with the suite of models and tools from the Riverscapes Consortium, they will find many ways to apply these products to suit their needs.





Summary of Riverscapes Consortium Products

Production-Grade Network Scale Models

Model Name	Summary	Applications
Riverscapes Context	Brings together disparate, contextual datasets relevant to riverscape health. Datasets include: topography, hydrology, human infrastructure, vegetation, ecoregions, administrative boundaries, climate, land management, and geology.	Accessing publicly available watershed datasets in one place with curated symbology.
Channel Area	Combines flow lines, flow areas and waterbodies into a single polygon layer of surface water extent.	This model creates data necessary for other models, but is unlikely to be needed by practitioners.
Terrain Analysis Using Digital Elevation Models (TauDEM)	Runs the TauDEM software to generate slope and Height Above Nearest Drainage (HAND).	This model creates data necessary for other models, but is unlikely to be needed by practitioners.
Valley Bottom Extraction Tool (VBET)	Delineates active and inactive floodplain and subdivides the valley bottom into DGOs.	Identifying areas where there are wide valley bottoms and potentially high recovery potential.
Beaver Restoration Assessment Tool (BRAT)	Estimates historic & existing beaver dam capacity as well as identifying risks, limitations & opportunities.	Viewing locations where BDAs and beaver dam introduction are suitable and more likely to be successful
Anthropogenic Context (Anthro)	Identifies rail, road and canal densities within the valley bottom, where they intersect channels, and calculates land use intensity.	Assessing risk and areas of opportunity for restoration design



Riparian Condition Assessment Tool (RCAT)	<p>Provides a quantitative assessment of current riparian condition based on:</p> <ul style="list-style-type: none"> - Fraction of existing riparian in the valley bottom compared to historic - Floodplain accessibility - Land use intensity within the valley bottom (from Anthro) 	<p>Identifying places with degraded habitat to prioritize for restoration (or areas in good condition to protect)</p>
Confinement	<p>Delineates valley margins and quantities level of confinement.</p>	<p>Helps to contextualize suitable restoration actions based on channel types and physical constraints</p>
Riverscapes Metric Engine (RME)	<p>Synthesizes upstream model metrics on DGOs & IGOs.</p>	<p>Investigating trends multiple riverscape health metrics in one project file. Most helpful for restoration prioritization at the region and network scale.</p>

Resources

- [Introduction to Riverscapes Network Models](#)

Riverscapes Applications

Model Name	Summary	Applications
Riverscapes Data Exchange	<p>The data exchange is a free portal where practitioners can discover, share and retrieve data, such as runs of RC-production grade models (e.g. BRAT, VBET, Anthro, etc)</p>	<p>Finding and downloading riverscapes projects. Some users are also able to upload riverscape projects, like QRiS geopackages.</p>
Riverscapes Viewer	<p>The web and desktop applications speed up the visualization of riverscapes projects with curated and</p>	<p>Visualizing riverscapes projects with curated symbology into the powerful</p>



	consistent symbology.	QGIS platform or explore them quickly in the web platform
Phlux	Phlux simplifies repeat photography. Organize and collaborate while documenting environmental change over time.	Simplifying repeat monitoring for monitoring restoration sites, grazing management changes, etc.
Riverscapes Studio (QRiS)	QGIS Riverscapes Studio or QRiS is a plugin that helps you digitize your riverscape data. It provides a flexible, extensible structure for your data, together with consistent symbology to streamline your analysis and reporting.	Digitizing project plan, as-builts, & monitoring data in one geopackage that can be uploaded to the Data Exchange.
LTPBR Explorer	The LTPBR explorer is a geospatial database that showcases LTPBR projects to encourage communication among restoration practitioners and document the areas of stream restoration.	Exploring and sharing LTPBR projects

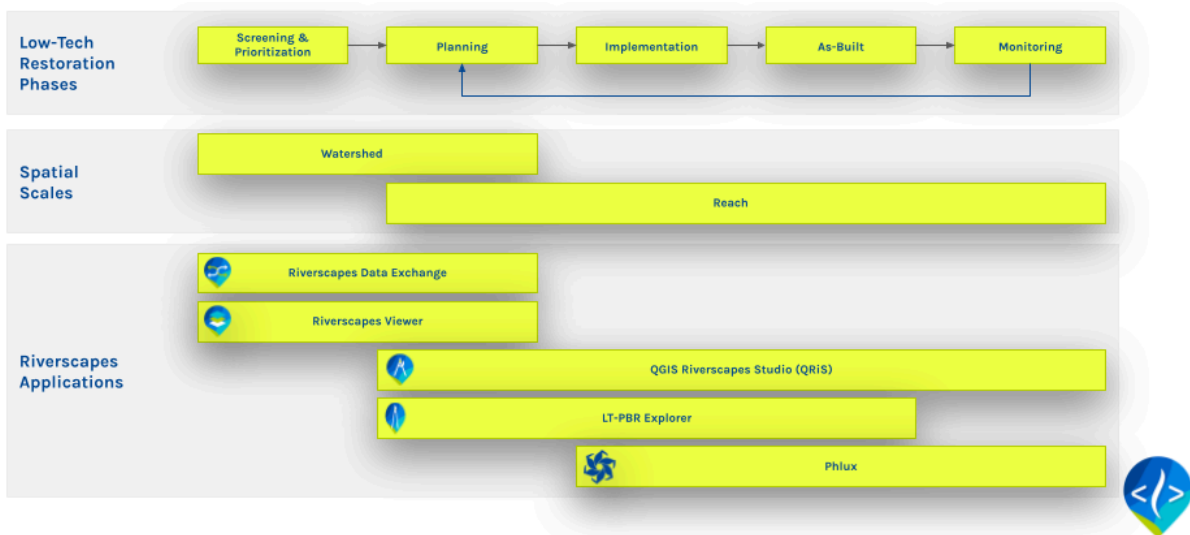
Resources

- [Introduction to Riverscapes Studio \(QRiS\)](#)
- [Introduction to Data Exchange](#)



Using Riverscapes Consortium products to plan & implement LTPBR

The figure below illustrates which applications are used at which spatial scale, and at which phase of planning and implementation. Below, example workflows for prioritization and planning at the different scales are presented.



Prioritization - Region to Network Scale

1. **Determine Suitability Criteria** - Work with project partners and stakeholders to determine the suitability criteria for restoration.
 - Example criteria
 - Streams with Bureau of Land Management (BLM) boundaries
 - Streams with high floodplain accessibility
 - Streams with high beaver dam building capacity
2. **Acquire Data** - Access the [Data Exchange](#) to find and download [Metric Engine](#) projects (or other relevant models) for the area of interest.
3. **Open the project in using the Riverscapes Viewers** (QVR is QGIS or ArcRV in ArcPro)
4. **Filter data based on suitability criteria**

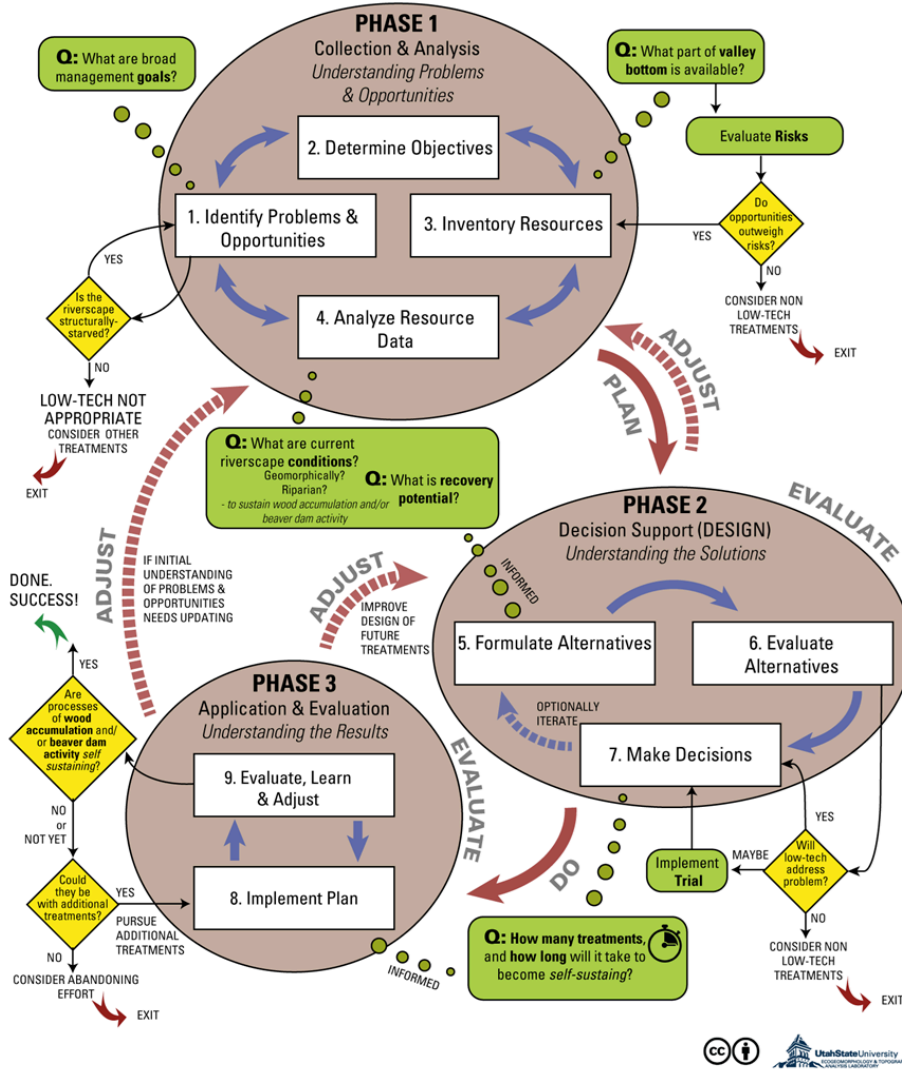


- Example filters
 - Select by attribute: Filter for “rme_dgo_ownership” = ‘BLM’
 - Select by attribute: Filter by attribute “rcat_igo fldpln_access” > 0.8
 - Select by attribute: Filter by “brat_igo_capacity” >= 10
- Refer to the [Using Filtering to prioritize restoration actions tutorial](#) for detailed steps on applying filters in QGIS
- 5. Evaluate filtered data** - Review the filtered Metric Engine outputs
 - Apply local knowledge and understanding of biology, hydrology & fluvial geomorphology
 - Consider stakeholder feedback to evaluate the potential restoration sites
- 6. Select restoration sites** - Based on the evaluation and filtered data, determine the most suitable restoration sites

Site Planning & Implementation - Riverscape to Reach Scale

The following workflow, based on the NRCS Conservation Planning Process, is an example of how to use Riverscapes products to assist in LTPBR planning at the riverscape to reach scale. In some cases, this is preceded by a prioritization phase (see above). At other times, the restoration site may already have been determined. In either case, the Implementation phase will follow a similar workflow.

PLANNING FOR LOW-TECH RESTORATION
As extension of NRCS Conservation Planning Process



Phase 1: Collection & Analysis

1. Identify Problems & Opportunities -

- Engage with local experts and stakeholders to gather insights about the site.



- Use the Data Exchange to access, view and download relevant riverscapes projects. RCAT, BRAT, and Anthro are a good starting point for most LTPBR projects.
- Determine if the system is structurally starved. If it is not, LTPBR may not be suitable.

2. Determine Objectives

- Use your understanding of the site and principles of fluvial geomorphology, hydrology, and biology to define clear objectives
- Involve stakeholders to ensure objectives align with their needs and expectations.

3. Inventory Resources

- Open the relevant riverscapes projects in QGIS using the Riverscapes Viewer.
 - Assess which parts of the valley bottom are accessible using VBET/RCAT
 - Identify potential risks to infrastructure and landowners using Anthro

4. Analyze Resource Data

- Use RCAT and BRAT to understand the current condition of the riverscape.
- Using information from the Riverscapes Models and your knowledge of the system, determine the recovery potential for the site.

Phase 2: Decision Support (Design)

5. Design

- Iteratively build your restoration design plan in Riverscapes Studio. Design should explicitly address specific restoration objectives. This is done by specifying the location of specific structures and/or complexes (groups of structures) designed to accomplish the restoration objectives identified (e.g., overbank flow, bank erosion and channel widening, bed aggradation, etc.).



Phase 3: Application & Evaluation

6. **Implementation** - Following implementation digitize your as-built in Riverscapes Studio in the same project file with the project design.
 - Upload your project to the LTPBR Explorer and/or the Data Exchange directly from Riverscapes Studio
7. **Evaluate, Learn & Adjust**
 - Capture and store monitoring data in your Riverscapes Studio project
 - Use Phlux to monitor site change over time.

Additional LTPBR Resources

- [LTPBR Manual](#)
- [LTPBR Pocket Guide](#)
- [Learning Modules \(Intro, Science, Planning, Design, Implementation & Adaptive Management\)](#)
- [Planning Report Outline](#)
- [Condition and Monitoring assessment form](#)

Questions?

Contact us at riverscapes.freshdesk.com or by emailing support@riverscapes.freshdesk.com