

FY 2025 Science Planning

TRRP Interdisciplinary Team (IDT)
Represented by Eric Peterson, Science Coordinator



Science Plan

November 21, 2022



Overview

- IDT is requesting approval of 3 project proposals
 - BMI Scour and Inundation, pilot long term monitoring (\$ 316,991)
 - Toward Foodscape Modeling (\$ 0 – TRRP staff time only)
 - Riparian Response to Stage Zero (\$ 231,664)
- Subject to revisions with IDT concurrence

Science Plan

Table 3. This table provides a summary of the steps, timing, and responsibilities involved in the annual science planning process. IDT = Inter Disciplinary Team, SAB= Science Advisory Board, EDO=Executive Director's office, TMC= Trinity Management Council.

Step #	Description	Whom	When
1	Confirm Key Uncertainties and determine focus for upcoming funding cycle	IDT	July (of previous fiscal year)
2	Develop specific research questions	IDT with input from SAB	Sept - Oct
3	Develop RFP	EDO supported by IDT + workgroups as needed	Nov - Dec
4	Post RFP	EDO	Jan 1 – Feb 28
5	Evaluation of individual project proposals	Workgroups + SAB	March - April
6	Develop science proposal (i.e., portfolio of projects to fund)	IDT	May
7	Presentation of science proposal	IDT	May
8	Funding decision	TMC	June
9	Contracting	EDO	Oct

Questions IDT Identified

- Nutrient Flux

- Q: What are the impacts **of scour and inundation on benthic macroinvertebrate** species composition and density, and how sub-geomorphic peak flow (<4,500 cfs) frequency, magnitude, and timing affect drift forage species composition, flux, and concentration on a systemic scale?
- Q: Develop a **spatial foodscape model linked to shear stress, grain size, topography, and hydrology** both for contrasting potential flow release schedules, and for potential input to the S3 fish production model.

- Wetted Width

- Q: Does implementing a design developed using a **Stage 0 channel design approach increase the richness and abundance (i.e., diversity) of riparian** and aquatic dependent plant species when compared to a channel design that has been designed using the Channel Design Guide?
- Q: Under **what conditions** are Lewiston Dam releases and/or tributary accretions **of flow sufficient to cause channel widening and increase wetted areas** in alluvial valleys?

Proposals Received

- Nutrient Flux

- Q: What are the impacts **of scour and inundation on benthic macroinvertebrate** species composition and density, and how sub-geomorphic peak flow (<4,500 cfs) frequency, magnitude, and timing affect drift forage species composition, flux, and concentration on a systemic scale?
- Q: Develop a **spatial foodscape model linked to shear stress, grain size, topography, and hydrology** both for contrasting potential flow release schedules, and for potential input to the S3 fish production model.

- Wetted Width

- Q: Does implementing a design developed using a **Stage 0 channel design approach increase the richness and abundance (i.e., diversity) of riparian** and aquatic dependent plant species when compared to a channel design that has been designed using the Channel Design Guide?
- ~~• Q: Under **what conditions** are Lewiston Dam releases and/or tributary accretions **of flow sufficient to cause channel widening and increase wetted areas** in alluvial valleys?~~

All proposals received at least 3 reviews.

- SAB reviewed all (and ranked them in the order I am presenting them)
- Riparian and Aquatic Ecology WG reviewed all
- Fish WG
 - BMI
- Flow WG
 - Foodscape
- Physical WG
 - Riparian

BMI Scour and Inundation, pilot long term monitoring

- Draft Proposal
 - Lindke, Laskodi, Som, Naman, O'Dowd
 - Colonization and community response to hydrology, inundation, and scour
 - Two years of sampling, as pilot, intending to become long-term monitoring
 - Short term BMI studies have been limited by the hydrology that happens
 - Year round, though double frequency Jan-June
 - With long term monitoring, expands our ability to evaluate management actions (flows plus)
 - More samples to be collected, than processed, for robustness to stochasticity
 - Takes advantage of hydrology what we get
 - CPHumboldt processes samples, grad student to analyze first 2 years
 - \$316,991 – target completion: December 2026
- Review Primary Points
 - Various discussion of sampling protocols
 - Consider some drift sampling
 - Ensure coordination with Foodscape Modeling
 - SAB: moderate revision



Toward Foodscape Modeling

- Draft Proposal
 - Full disclosure: this is mine, along with McSloy and possibly Buxton
 - Will not go all the way to modeling foodscape
 - But establishes the modeling infrastructure for later parameterization with BMI
 - Will provide outputs on cumulative hectare days of inundation and channel since scour
 - This is expected to add DSS contrast between alternative hydrographs founded in current food-web science
 - Will be demonstrated with past 3 years of hydrographs
 - Implemented (Crit Dry, Wet with elevated baseflows, and Wet with traditional start)
 - ROD
 - Full Natural Flow
 - Possibly full implementation of winter flow variability
 - \$0 – target completion: early 2025
- Review Primary Points
 - Consider river foodscape models already available in the literature.
 - Some suggestions on modeling pathways
 - Ensure coordination with BMI sampling
 - More hydrographs to demonstrate
 - SAB: moderate revision



Riparian Response to Stage Zero

- Draft Proposal
 - Yates, Alvarez, Bair
 - Comparison of vegetation response at Oregon Gulch (stage-0) versus Chapman Ranch and Upper Conner Creek
 - Hydraulic modeling, TARGETS modeling, versus field measurements
 - Model what is expected, field sampling to confirm or refute
 - \$231,664 – Target completion: June 2026
- Review Primary Points
 - Needs clear, testable hypotheses
 - Timeline... little time for vegetation to develop
 - Field verification/sampling...
 - UAS?
 - Are proposed methods too intensive (within a single year)?
 - Are proposed methods not extensive enough (using a single year)?
 - SAB: major revision (Physical WG too)



Path Forward (IDT Request to TMC)

- Reviews recommended proceeding with proposals
 - But with revisions
- IDT would like to have investigators revise proposals within the month of June
 - IDT will review revisions late June / early July
- IDT requests that the TMC approve funding (\$548,655), contingent upon revision and consensus at IDT to accept, and with budgets adjusted accordingly (for possible cost savings - no significant increases).
 - *Can be part of the broader budget motion later.*
 - Example from the past:
 - *Meeting: 2018-09-05-2018-09-06*
 - *Mike Orcutt made a motion to follow the ED's advice to fund the additional two proposed projects for the estimated \$350,000 subject to IDT team review and contingent on their concurrence. The projects proposed include the Channel rehab site effectiveness monitoring (TRRP-2018-035) and Macroinvertebrate Drift (TRRP-018-029). Justin Ly seconded the motion.*
 - *Motion PASSED 7 / 0 / 0*