Klamath Basin Integrated Fisheries Restoration and Monitoring Plan (IFRMP)

Phase 3 - Prioritization Criteria Quick-Reference Guide

1 Multi-Criteria Scoring Approach

After careful consideration of alternatives, we adopted a **multi-criteria scoring approach** to prioritization that has undergone multiple rounds of peer-review by Sub-basin Working Group (SBWG) participants. The multi-criterion prioritization framework developed for Phase 3 of the IFRMP is based on **six key questions** to ask about any restoration project under consideration, which are linked to corresponding criteria as outlined in **Table 1**. These criteria are explained further below.

Table 1: Summary of key prioritization questions and corresponding criteria used to score and rank proposed restoration projects to determine priority sequencing based on available information.

Key Prioritization Question	Corresponding Criterion	Source of Information
1. Are focal fish present in the place a project is being proposed?	**Criterion 1 - Range Overlap:** Overlap of relevant focal species distributions with the location(s) of the proposed restoration project	Data-driven *(with expert validation of data)*
2. How impaired is the watershed in the place a project is being proposed (how much is restoration needed)?	**Criterion 2 - CPI Status:** The magnitude of impaired ecosystem processes and fish habitats, used as an indicator of restoration need.	Data-driven *(with expert validation of data)*
3. How many stressors is this project going to address?	**Criterion 3 - Stressors Addressed:** The total number of stressors addressed by the restoration action (in relation to biophysical tiers & species)	Data-driven *(with expert validation of data)*
4. How far and wide will project benefits be felt?	**Criterion 4 - Scale:** Perceived scale of restoration project benefit for relevant focal species, from local to basin-wide benefit.	Expert elicitation *(through a survey)*
5. Is it feasible to implement this project in this place?	**Criterion 5 - Implementability:** Reflecting how easy it would be to implement the project based on current expert-based understanding of cost, permitting, political, logistical, or other similar considerations.	Expert elicitation *(through a survey)*
6. How much do we care about the answers to each question?	**Criterion Weights (W):** Are set collectively by each Sub-Basin Working Group and are applied to each criterion above to determine their relative importance, which may vary by sub-basin or scenario.	Expert elicitation *(through facilitated discussion)*

Overall Prioritization Formula

$$\textbf{Prioritization Scores} = (W_1 * Range\ Overlap) + (W_2 * CPI\ Status) + (W_3 * Stressors\ Addressed) + (W_4 * Scale) + (W_5 * Implementability)$$

How should we interpret the results of prioritization?

- **Prioritization scores and ranks reflect the suggested sequencing of projects to meet the overarching goal of the IFRMP, which is to obtain the greatest benefits across the widest range of focal species and stressors across a given sub-basin.**
- The results do NOT do not reflect the overall importance or validity of a proposed project, and a lower prioritization score does not mean a project shouldn't be implemented.
- These scores and ranks will also be different for different prioritization objectives, such as single-species management or importance to other organizations and initiatives.

How will these prioritization results be used to inform restoration decisions?

- The prioritization scores and rankings that emerge from this process should be thought of as **an initial result intended to encourage informed and systematic discussions** of the benefits, opportunities, and risks of different strategies to improve fish habitat and stream function rather than a rigid list defining exactly what restoration must occur.
- It is likely that **the original sequencing may need to be adjusted by reviewers to reflect dependencies between projects or other contextual factors** not easily captured in a criteria-driven prioritization tool.
- Final decisions about which projects to implement must be informed by professional judgment, taking into account prioritization outcomes as well as additional information including landowner interests, opportunities created by special funding or scheduled maintenance, and restoration emphasis in a particular watershed by multiple agencies or stakeholders.
- In addition, any prioritization method should be **iteratively applied every few years** as state of the system and social landscape changes over time. The priorities identified during IFRMP work in 2020 may not remain accurate in 2024 and beyond.
- *It should be noted that projects and sequencing identified in the IFRMP restoration planning process are not binding on federal agencies and do not commit federal funding, or future federal funding, to specific restoration projects.*

1.1 Criterion 1: How Is Range Overlap Assessed?

What Is This Criterion?

The **Range Overlap** prioritization criterion is intended to evaluate how much a proposed restoration project in a specific location overlaps with important habitat for focal fish species. This is assessed by using the best available information on the historical habitat, current habitat, federally-designated critical habitat, and working group-defined special emphasis areas for each of the 10 focal species of the IFRMP which have been mapped to every sub-watershed (HUC12) in the Klamath Basin.

What Data Inform This Criterion?

Key datasets used to compile species range information include ODFW Fish Habitat Distribution Data, USFWS Critical Habitat Designation data, UC Davis PISCES Fish Range and Occurrence Data, the Pacific Lamprey Assessment And Template For Conservation Measures In California (USFWS 2012b) and the Species Status Assessment for the Endangered Lost River and Shortnose Sucker (USFWS 2019c). Each of these initial data sources was reviewed by local species experts and suggested adjustments to range maps were made accordingly.

How is the Information Used in Prioritization?

Within the prioritization equation, **a restoration project located in one or more HUC12 sub-watersheds receives one Range Overlap point for meeting each of the conditions below for *each* focal species:**

- Overlaps with area of **historical distribution**
- Overlaps with area of **current distribution**
- Overlaps with **Federally-designated critical habitat**
- Overlaps with areas identified by participants as **special emphasis areas (e.g., "anchor habitat"),** that is, areas that are considered poised to make a particularly important production contribution for an IFRMP focal species and warrant special consideration when prioritizing restoration sites. This could include places with life-history connectivity adjacent to higher functioning habitats that offer promise in restoring strongholds.

For each HUC12 assigned to a restoration project, the range overlap scores for each of the 10 species and their run types (Eulachon, Coho, Spring Chinook, Fall Chinook, Summer Steelhead, Winter Steelhead, Sockeye, Pacific Lamprey, Green Sturgeon, Lost River Sucker, Shortnose Sucker, Bull Trout, Redband Trout) are determined per the categories above and then summed together. These independent focal species scores per restoration project are normalized on a standard 0 to 10 point scoring scale based on the raw point scores generated for all candidate restoration projects that are in the study frame. **The candidate restoration project with the highest score receives the maximum point allowance of 10 for this criterion. The other candidate restoration projects in frame are scaled accordingly.** Finally, the normalized range overlap score can be modified by a weighting factor (W1; 0-1 scale) that lets participants specify how much importance to place on the species range overlap criterion ***itself*** in the overall prioritization score.

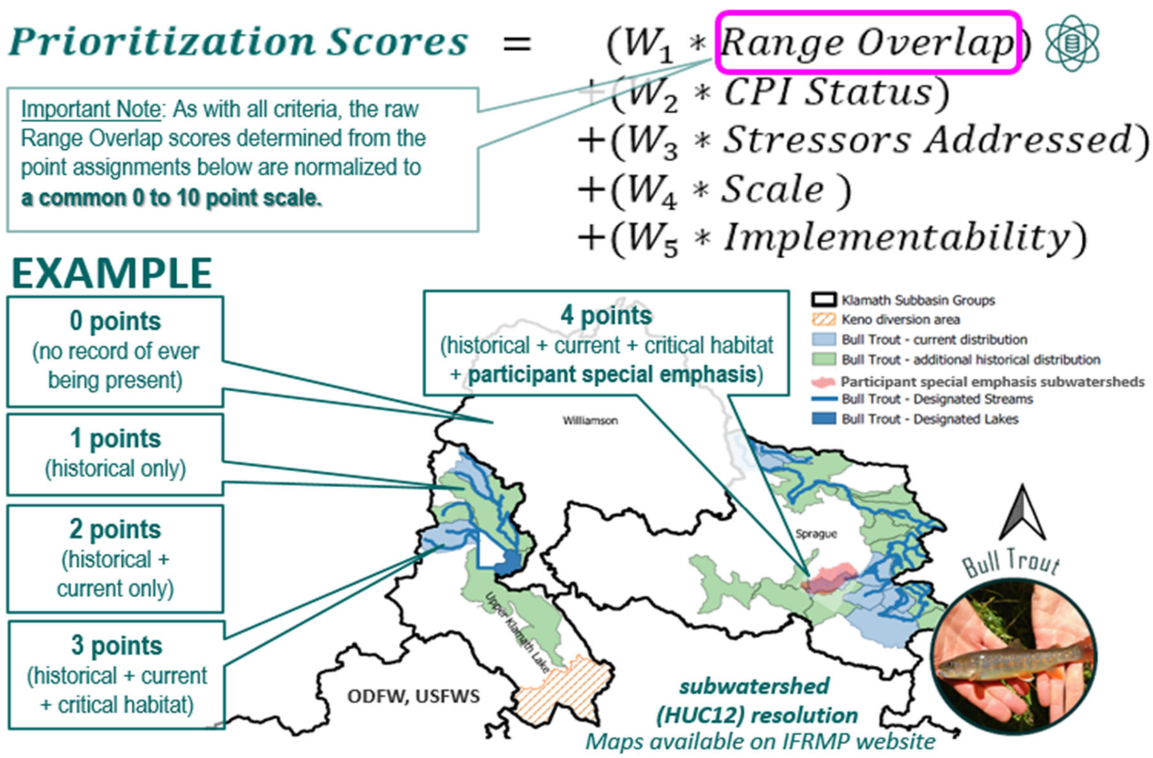

Figure 1: A visual summary of how the Range Overlap criterion score is determined.

1.2 Criterion 2: How Is Habitat Restoration Need Assessed?

What Is This Criterion?

In the IFRMP, **Core Performance Indicators (CPIs)** are indicators of fish habitat status that participants have identified for use in future monitoring of status and trends in the Klamath Basin. Within the IFRMP multi-criteria scoring prioritization framework, CPI scores or CPI proxy scores are intended to act as a measure the overall level of existing habitat impairment or "habitat restoration need" in areas of current or potential fish habitat. Several CPIs have been suggested to date that correspond to one of the functional watershed tiers and also to one of four spatial scales. This list has been iteratively refined through participant feedback through a CPI Survey and CPI Webinar (more details available though the Klamath website).

What Data Inform This Criterion?

Without a basin-wide monitoring framework already in place, data on all of the proposed CPIs will not be readily available for all parts of the basin over which prioritization must take place, which will make it harder to fairly compare projects against one another in the prioritization scheme.

To help correct this issue, we have also worked with participants to identify a suitable range of landscape-scale **CPI proxy indicators** for each of the selected CPIs which are associated with publicly available data at the subwatershed (HUC12) hydrologic scale throughout the Klamath Basin. Decisions about which proxies to include in the final list considered participant reflections on proxy data quality, appropriateness for prioritization (as opposed to simply monitoring), and level of agreement about the proxy. These proxies or analogs were used to automatically populate "default scores" for CPI status in the interactive prioritization tool to help approximate "habitat restoration need" when data on the specific site-scale CPIs is not readily available. There is a long history of using landscape-scale metrics for spatial prioritization of watershed restoration projects (e.g., Thom et al. 2011 for the Columbia River Basin and Fesenmeyer et al. 2013 across the state of California), and it helps to provide an even playing field for comparing project locations in relation to habitat impairment across the entire basin.

The final set of CPIs and CPI proxies selected by participants for use in first-pass prioritization is summarized in Table 2*. It should be noted that only CPI proxy data was used for this first round of prioritization as data for preferred CPIs themselves was not consistently available across all CPIs, species, and areas of the Klamath Basin.* Although participants were given multiple opportunities for manually overriding this default proxy CPI data before, during, and after sub-basin webinars, participants chose not to do so in this phase of work. Instead, more concerted efforts to identify existing CPI datasets and discuss the best ways to integrate them into the tool will continue in Phase 4 of work.

How is the Information Used in Prioritization?

CPI proxy data for each indicator exists for each of the HUC12 sub-watersheds in the Klamath Basin, and are normalized from their original units of measure to a common scale of 0 to 10 to facilitate comparison.

These normalized **individual HUC12 CPI scores must be aggregated** together to arrive at a single score for any proposed restoration project, which could include multiple HUC12 sub-watersheds. In the prioritization equation, the scores for each CPI proxy are aggregated first across HUC12 sub-watersheds where the project takes place (Step 1) as summarized in Figure 2. When CPI scores for each functional tier are aggregated to a single tier scores (Step 2), **tier weights can be applied** to specify the importance of impairment in each watershed tier (Step 3). For example, CPI scores for fluvial geomorphic process impairment may be given a higher weight than CPIs in other tiers to reflect the current local restoration strategy. The tier scores and weights are used to generate a single weighted average score (Step 4) to arrive at one final score reflecting overall habitat impairment in the project location.

In addition, **users can use a toggle function in the prioritization tool to choose between prioritizing Low, Moderate, or High Impairment** areas depending on the local context and restoration objectives. In some cases, it may be more desirable to prioritize moderately impairment habitat instead of high impairment habitat, which may be too severely degraded to achieve effective restoration outcomes. The current default in the tool is to prioritize Moderate impairment, unless sub-basin participants chose otherwise.

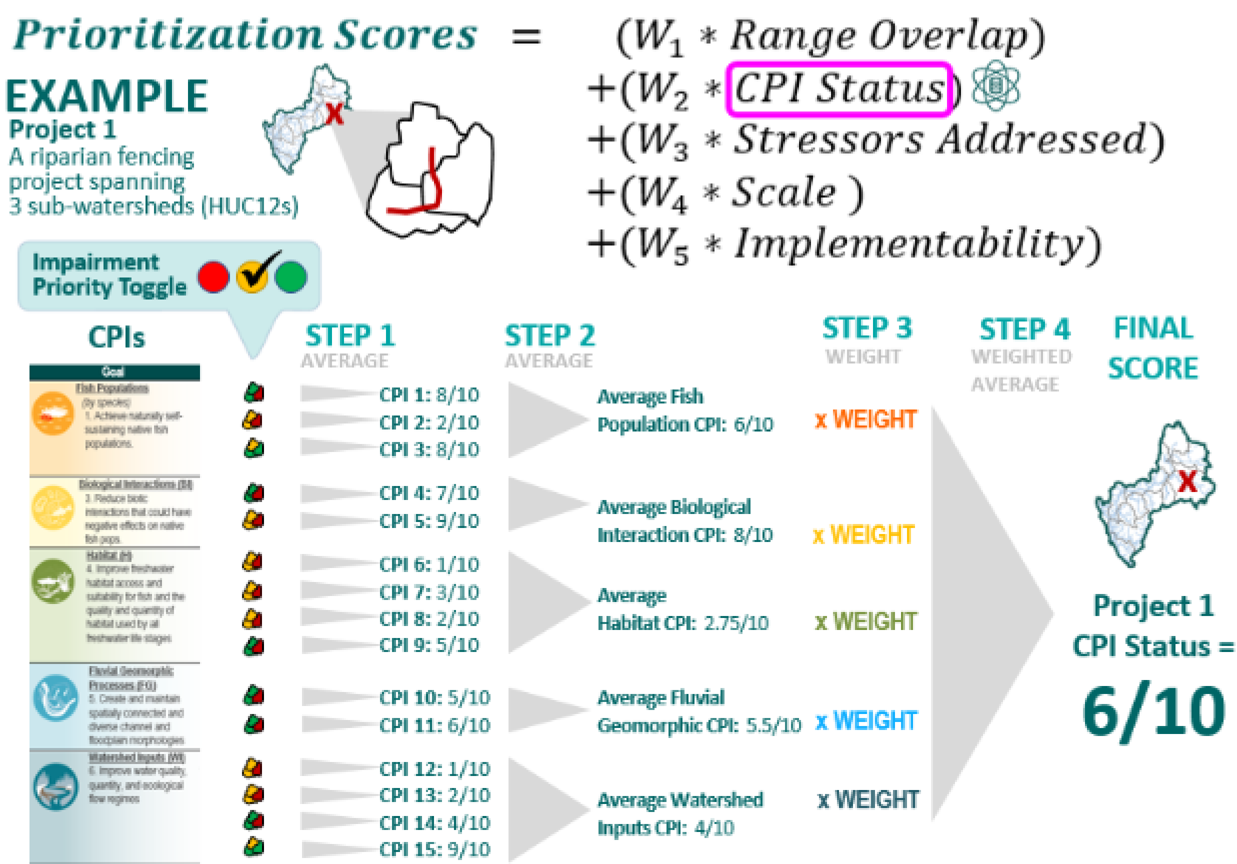

Figure 2. A visual summary of how the "Habitat Restoration Need" or CPI criterion score is determined. Where CPIs were not available, CPI proxies were used in the same way. Importantly, participants were able to choose which level of impairment should be prioritized in a sub-basin to reflect different strategies.

Table 2: IFRMP Core Performance Indicators and proposed CPI proxies (in dark yellow) selected by Sub-basin Working Group participants across goals and spatial scales, with relevant objectives for each listed in [square brackets]. Indicators relevant to the mainstem are captured at the sub-basin scale for those sub-basins it runs through.

Goal	Site / Reach	Sub-watershed	Sub-basin*	Whole Basin
Fish Populations (FP) 1. Achieve naturally self-sustaining native fish populations.	• Presence / absence [1.3, 1.5] • Presence of spawning [1.2, 1.3] • Presence of rearing [1.2, 1.3]	• Juveniles per adult [1.1]	• % sub-watersheds of historical habitat occupied [1.5] • Age structure / demographics [1.2] • Genetic & Life History Diversity [1.4]	• # sub-basins achieving sub-basin population targets (for occupancy, abundance, extinction risk, etc.) for species that have targets [1.3, 1.5]
Biological Interactions (BI) 3. Reduce biotic interactions that could have negative effects on native fish pops.	• Non-native species presence, abundance [3.2] ○ Proxy: # Aquatic invasive species per subwatershed	• Prevalence of infection [3.1] • Prevalence of mortality [3.1] • % Sub-watersheds with high levels of impact by non-native species [3.2]	• % Sub-watersheds with high prevalence of infection, mortality [3.1]	• % of sub-watersheds with high levels of impact by non-native species [3.2]
Habitat (H) 4. Improve freshwater habitat access and suitability for fish and the quality and quantity of habitat used by all freshwater life stages	• Core Water Quality Metrics in suitable ranges (*by species*) [4.2] *Temperature, Dissolved Oxygen, pH, Total Phosphorous, Total Nitrogen, Nuisance Phytoplankton (density, chlorophyll-a, cyanotoxins)*	• Stream Condition Index [4.3] • Habitat Suitability Rating [4.5] ○ Proxy: EPA - % Potentially Restorable Wetlands; • % historical habitat accessible [4.1] ○ Proxy: EPA - Density Road-Stream Crossing; Trout Unlimited - Ratio current max. stream network connectivity to historical (inland) • % suitable habitat occupied [4.1, 4.5]	• % historical habitat accessible [4.1] • % suitable habitat occupied (e.g., high intrinsic potential) [4.1] *[these two rolled up to sub-basin scale]* • Extent thermal refugia habitat [4.2, 4.5] ○ Proxy: NorWeST Mean Aug Stream Temperatures – 2040s	• % historical habitat accessible [4.1] • % suitable habitat occupied (e.g., high intrinsic potential) [4.1] *[these two rolled up to whole-basin scale]*
Fluvial Geomorphic Processes (FG) 5. Create and maintain spatially connected and diverse channel and floodplain morphologies	• Large wood recruitment and retention (as a contributor to embeddedness) [5.3] ○ Proxy: EPA - % Developed, High Intensity in RZ (riparian zone); Density all roads in RZ (riparian zone)	• Geomorphic flushing flows (extent, frequency, duration) [5.1] • Floodplain connectivity (area, volume, stage) ○ Proxy for Area: EPA - % Developed, High Intensity in HCZ (Hydrologically Connected Zone); Proxy for Area & Volume: Net river-floodplain exchange in unconfined reaches (composite proxy) • Index of channel complexity	• Extent, frequency, and duration of inundation at identified key flow thresholds [5.2] *(including floodplain, wetlands, off-channel habitat)* • Annual measures of change in topography and bathymetry [5.2]	• N/A
Watershed Inputs (WI) 6. Improve water quality, quantity, and ecological flow regimes	• N/A	• Monthly flows as % measured / modeled historical natural flows [6.1] ○ Proxy: Trout Unlimited - Water Quantity Sub-Index, Flow volume change risk II (base flow) • Annual loads of nutrients [6.1] ○ Proxy: Trout Unlimited - # Diversions per stream mile; EPA - % Agriculture in Watershed • Annual loads sand or larger grain sizes (magnitude, variability) [5.2] ○ Proxy: USGS Count Past Placer Mines in Sub-Watershed • Annual loads fine sediment (magnitude, variability) [5.2] ○ Proxy: EPA - PHWA Wildfire Vuln. Sub-index, Density all roads in Watershed	• % of sub-watersheds with desirable mean flow and sediment conditions [6.1, 6.2, 6.3]	• N/A

1.3 Criterion 3: How Are Stressors Addressed Assessed?

What Is This Criterion?

The **Number of Stressors Addressed** prioritization criterion evaluates how many stressors a given type of restoration action is expected to address for the focal fish species in the project location. This helps to provide a rough idea of the relative scope of benefit associated with different types of projects to go along with the Scale of Benefit criterion for individual projects.

What Data Inform This Criterion?

Linkages between focal species, project types, and key stressors addressed were previously identified using conceptual models created in Phase 2 of the IFRMP planning process, which relied on input from the published literature and from IFRMP participants contributing to surveys and workshops during Phase 2 of IFRMP development 2018-2019. These linkages have been further updated through additional participant input in Phase 3 of the IFRMP planning process.

The IFRMP 'stressor-action linkage dictionary' available for download from the Klamath IFRMP website documents the action types and the corresponding stressor types and associated specific stressors they are expected to address is. These action types and stressors were modified from the NOAA Pacific Salmon Restoration Fund Data Dictionary, and combined with IFRMP Phase 2 conceptual modelling provide the framework for a systematic classification of what watershed restoration action types address different lists of key stressors. In some cases, the original framework includes multiple related stressors for specific stressor themes (e.g., there are 5 stressors related to water quality). To avoid inadvertent weighting due to some redundancy in very similar detailed stressor categories, the complete list of 71 stressors was mapped onto a smaller set of 23 unique stressor categories.

How is the Information Used in Prioritization?

Because stressors are species-specific, the first step in determining the overall score for this criterion is to identify which focal species are present anywhere in the project area based on the same species distribution data used in the Range Overlap criterion (Step 1). Importantly, this count includes both current and historical species. Next, a stressor-action linkage database based on the data dictionary noted above is scanned to obtain a tally of the total number of unique stressor categories addressed by the action type(s) associated with the overall project for each focal species associated with the overall project area (Step 2).

Each stressor category is then assigned two weights (from 0 to 1) based on the sub-basin specific priority level assigned by Sub-Basin Working Groups to:

(i) the functional watershed tier at which each associated stressor category occurs (Step 3), and

(ii) the priority level of individual species benefiting from addressing the stressor category (Step 4).

For each stressor category, the product of these weights is calculated and then normalized to a common scale from 0 to 10 (Step 5). The final "tier-weighted" and "species-weighted" score for the project is calculated as the sum of these weighted scores across all of the stressor categories addressed by the project, and this is then normalized relative to the maximum stressor score across all projects in the sub-basin to put all projects on one comparable stressor scale (from 0 to 10).

Note that, because stressors categories are summed, projects including a larger number of HUC12 sub-watersheds may receive higher scores, but only if there is high spatial variability in the way species are distributed across the sub-basin. Where this is the case, it reflects a real advantage in the number of stressors addressed by a project across multiple species.

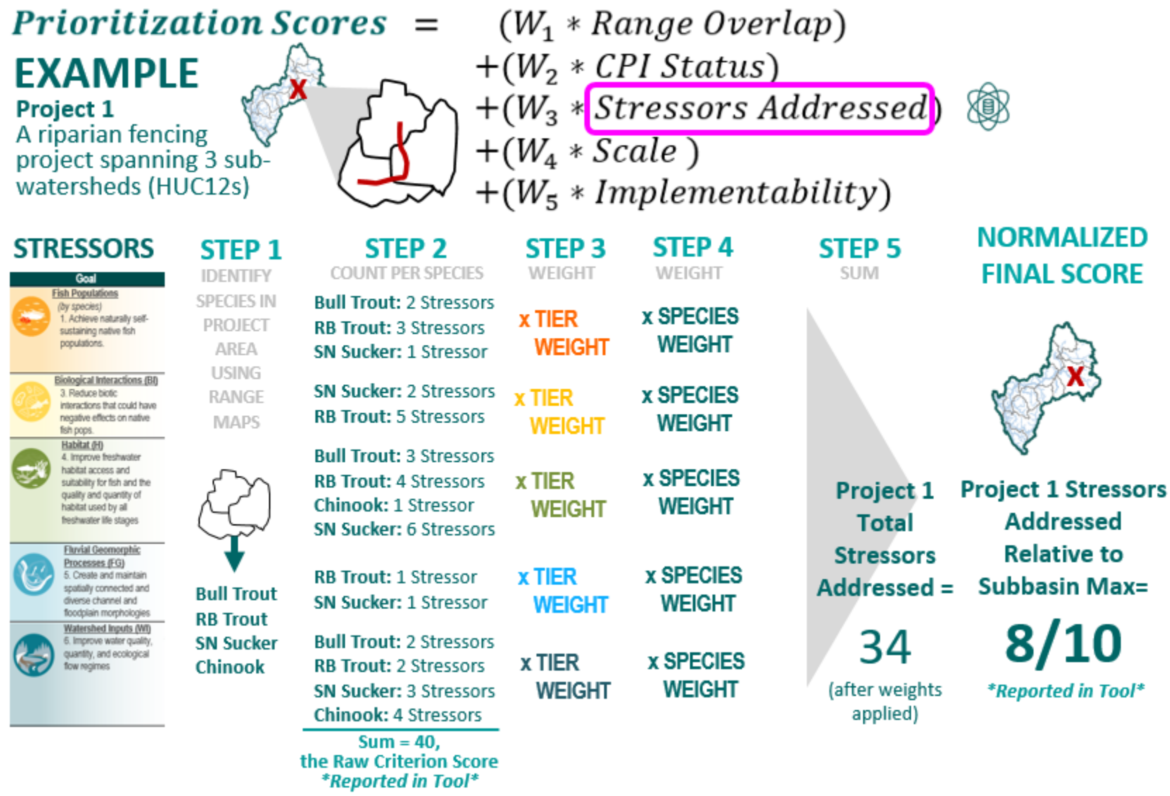

Figure 3. A visual summary of how the Number of Stressors Addressed criterion score is determined.

1.4 Criterion 4: How Is the Scale of Potential Benefits Assessed?

What Is This Criterion?

The **Scale of Potential Benefit** criterion is intended to reflect how far and wide beyond the project area the *benefits* of a restoration action are expected to be felt and is distinct from the project's actual footprint. For example, a project that helps to reduce nutrient inputs to an important tributary is also expected to have benefits for fish in downstream reaches, while a project that removes a dam is expected to have benefits for fish now able to migrate into upstream reaches.

What Data Inform This Criterion?

The scores assigned to various scales of benefit are illustrated in Figure 4, following **the standard 0 - 10 point raw scoring scale used for each of the IFRMP scoring criteria**. Each individual proposed restoration project is assigned a single score based on the central tendency of Sub-Basin Working Group responses to a Scale of Benefit Survey and discussions within each group. Web-based survey methods can be designed and deployed in facilitated meetings to develop weighting preferences that are representative of a broad audience. On the survey, participants were asked to assign a Scale of Benefit score to each proposed restoration project based on the following definitions for each scale:

- **Site Scale Benefits:** The project has significant fish habitat benefits within a small area directly associated with the project footprint (e.g. channel structure that creates pool rearing habitat).
- **Stream/Tributary Scale Benefits:** The project has significant fish habitat benefits both within the project footprint and to a variable extent to localized set of upstream, downstream, and/or adjacent HUC12s to the project site (e.g. riparian planting that creates stream shading with associated

cooler water temperatures at the project site as well as cooler water temperatures for a variable stream length below the site until temperature effects dissipate; removal of a stream culvert that opens up habitat at the site and for a variable length of the stream network above the culvert).

- **Sub-basin Scale Benefits:** The project has significant fish habitat benefits across the majority of HUC12s in the sub-basin (e.g. irrigation practices that benefit flows in all sub-basin streams).
- **Whole Klamath Basin Scale Benefits:** The project has broadly significant fish and habitat benefits across most or all sub-basins with the Klamath Basin. Examples:
    - a packaged suite of actions completed within approximately 5 years that dramatically reduced nutrient inputs in the upper watershed, enforced water use restrictions, and substantially improved flow management at dams with fish passage facilities or reconnecting key thermal refugia critical for the population persistence of migratory species or
    - if approved the removal of four mainstem Klamath River dams or
    - the addition of extensive and effective fish passage facilities at these mainstem dams if ultimate removal is not approved.

Participants were also reminded to limit their interpretation of these definitions **to the individual incremental project under consideration for prioritization, NOT the cumulative total of the class of the project** that may already be implemented in the sub-basin over 6+ years or to consider the impact of that class of action *if it were to be* implemented generally among multiple sub-basins.

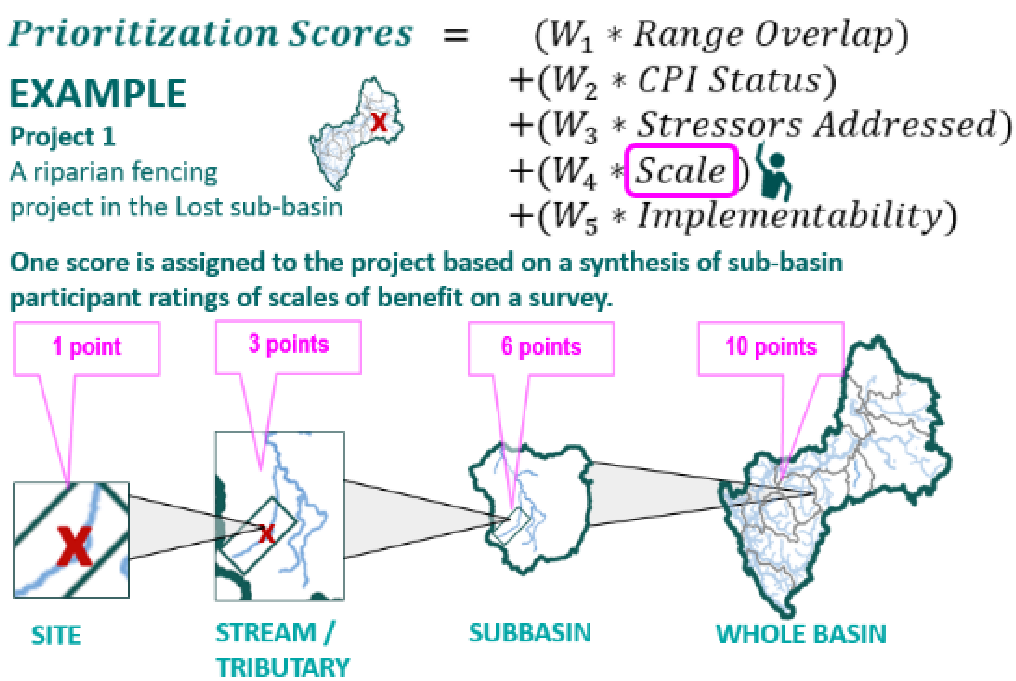

Figure 4. A visual summary of how the Scale of Benefit criterion score is determined.

The ESSA team further screened these assignments for consistency across sub-basin teams to help align different sub-basin team interpretations for consistent scoring across the entire basin.

How is the Information Used in Prioritization?

The individual Scale of Benefit scores for each proposed restoration project are multiplied by the weight assigned to the Scale of Benefit criterion and used directly in the overall project prioritization score sum without further modification.

1.5 Criterion 5: How is Implementability Assessed?

What Is This Criterion?

Restoration projects can grind a halt due to opposition if decision-makers fail to recognize the importance of social and logistical considerations. The **Implementability** (or feasibility) prioritization criterion evaluates how easy participants think it should be to implement a particular type of restoration action. **The term 'implementability' can encompass many considerations such as technical feasibility, permitting complexity, and willingness of implementation partners including management agencies, restoration organizations, and landowners to cooperate on a given type of project.** Although it may also sometimes consider cost, we will be considering cost separately in Phase 4 of work. To collect opinions and generate a score for this criterion, the *exact details* of what participants think make some restoration actions more or less implementable is not critical to distinguish.

What Data Inform This Criterion?

Implementability was assessed using a special kind of web survey called a **'Q Sort'**, which helps to identify the degree of agreement or disagreement among participants about the implementability of different types of restoration actions. This type of survey requires participants to make trade-offs by arranging a set of **'restoration action statements'** (e.g., "Increase riparian planting") on a pyramid shaped grid along a scale from 'Hardest to Implement' (-4) to 'Easiest to Implement (+4), where 0 is a neutral response. This approach helps to identify restoration actions that have high agreement ('consensus'), some consensus, and disagreement, with respect to the feasibility of implementation.

The Q-method approach is quick, statistically robust and works well with relatively small sample sizes like the Klamath sub-basin teams. In the IFRMP prioritization equation (see below), each action type assigned to a restoration action is associated with one or more restoration action statements from the Q Sort. You can read more about the Q-Method in a short, open-access paper by Zabala et al. (2018) which provides a high-level review of how the method works and how it has been used in conservation and natural resource management contexts around the world.

How is the Information Used in Prioritization?

The individual Scale of Benefit scores for each proposed restoration project are multiplied by the weight assigned to the Scale of Benefit criterion and used directly in the overall project prioritization score sum without further modification.

The Q Sort survey results are analyzed using a statistical method called factor analysis, which identifies factors, or groupings of statements that are representative of one or more 'viewpoints' detectable from participant responses. **Based on differences and similarities across these groupings, each statement is assigned a score** if it falls in one of the following four categories: general agreement the statement is very implementable (3 points), general agreement the statement is somewhat implementable (2 points), unclear implementability because there were diverging views or general agreement around 'neutral' (1 point), or general agreement the statement is unimplementable (0 points). These scores are normalized to a scale from 0-10 and the average of these normalized scores is taken across all statements to generate a final project-level implementability score.

Note that although implementability was one of the original criteria in our prioritization framework, participants elected to use it only as metadata for first-pass prioritization in Phase 3 of the IFRMP planning process, and so **implementability scores do not factor in to overall prioritization scores or rankings in this phase.**

$$
\begin{aligned}
\textit{Prioritization Scores} = \; & (W_1 * \textit{Range Overlap}) \\
& + (W_2 * \textit{CPI Status}) \\
& + (W_3 * \textit{Stressors Addressed}) \\
& + (W_4 * \textit{Scale}) \\
& + (W_5 * \textit{Implementability})
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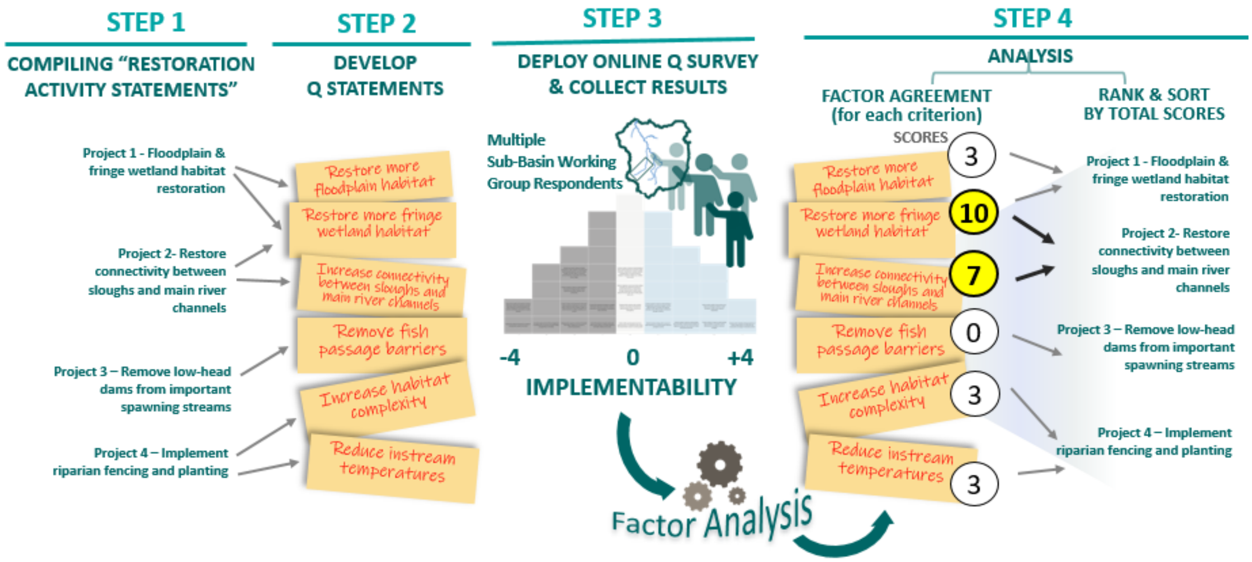

Figure 5. A visual summary of how the Implementability criterion score is determined.

1.6 The Klamath IFRMP Restoration Prioritization Tool

As part of developing the Plan, our team developed interactive, web-based **Klamath IFRMP Restoration Prioritization Tool** (Figure 1-6). This Tool was intended as a platform to meet the following restoration planning needs:

- pulling together the multiple strands of information being considered as part of prioritization into one place for ease of access and review,
- automatically calculating criteria scores and sorting projects based on myriad input data that can be collected at the basin-wide scale,
- allowing for dynamic adjustments to input data (including overriding proxy information with detailed site specific information as it becomes available) and the relative importance of criteria during facilitated webinars with Sub-basin Working Groups to see how it might affect sorting results,
- provide a one-stop service to make it highly efficient to add new restoration projects and remove others based on results of adaptive management and monitoring,
- providing a quick way to access the results and their associated project metadata, and
- serve to consistently organize and inform future prioritization efforts and discussions within the basin.

Accessing the Tool

Website: http://klamath.essa.com
Username: ifrmpguest
Login: ifrmp2020

Note that this is a **read-only guest account** displaying the current status of prioritization results as determined by Sub-basin Working Groups. While guest users can adjust different settings to see how priorities reshuffle, these settings will not be saved.

Importantly, the Tool has been developed to **allow restoration planning participants to adjust weights applied to different criteria, watershed tiers, and species to reflect changing restoration goals, objectives, and funding contexts** and thus extend the longevity and utility of this product. For example, participants may choose to place higher weights on actions that alleviate stressors operating at the watershed input and fluvial geomorphology levels compared to other tiers if there is general consensus that this is the key limiting factor for fish populations in a particular sub-basin. Similarly, participants may choose to place higher weights on the habitat processes watershed tier or on a specific species if there are possibilities to take advantage of new funding opportunities that may be earmarked for these specific uses. These and other weighting factors chosen require the application of expert judgment and need to be agreed upon by a representative group of restoration planning participants working in a given sub-basin. In practice, adjusting weights in the future would include pilot testing and sensitivity analysis through facilitated group discussions, as were carried out in the current phase of work.

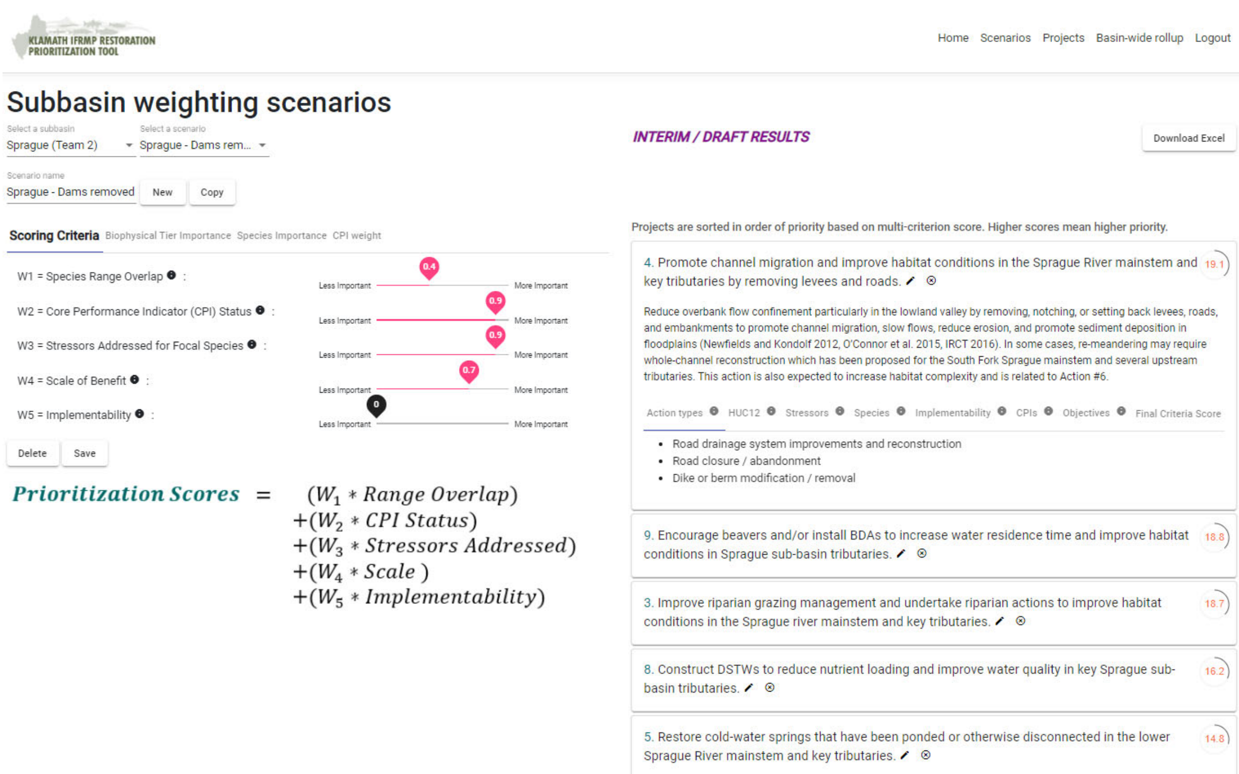

Figure 1-6. A screenshot of the main prioritization interface of the 3.4 Klamath IFRMP Restoration Prioritization Tool, accessible to Sub-Basin Working Group participants and to guests through their login credentials via http://klamath.essa.com/.

The Klamath IFRMP Prioritization Tool (http://klamath.essa.com) provides a rigorous, transparent and consistent method across the entire Klamath basin. Adjustments to various inputs and weighting factors are structured and automated to ensure consistency and scoring flexibility. The tool is specifically designed to be routinely updated based on results of ongoing adaptive management and monitoring. Readers are encouraged to log into the tool and experiment with alternative weighting systems to test the sensitivity of priority rankings.
