

# Appendix 9

## Additional Aquatics Guidance and USFWS and NMFS Matrices

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Appendix 9 of the Supplemental Draft EIS is incorporated by reference, in accordance with 40 CFR 1500.4(j) and (o), 1502.21 and 1506.4. The incorporated material can be found on pages 9-1 through 9-58 in Volume 2 of the Supplemental Draft EIS. The content is briefly summarized below, with changes based on public comment and internal review following the summary.

### Summary

The information in this appendix supports and guides the objectives and standards in Chapter 3 and is not intended to stand alone.

The first section of this appendix describes one component of the aquatic and riparian strategy for Alternative S1: Riparian Management Objectives (RMOs). The second section describes the Sediment Delivery Influence Area used in Alternative S2 and S3. The last section contains the U.S. Fish and Wildlife Service and National Marine Fisheries Service Matrices of Pathways and Indicators used as an interim procedure to determine project consistency until Watershed Condition Indicators are developed (see Chapter 3 for more information). These matrices were combined for the Final EIS to facilitate their use in project design and evaluation within the National Environmental Protection Agency (NEPA) analysis and decision-making process.

## Modifications Made to ICBEMP Supplemental Draft EIS Appendix 9

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9-4/right

***Revise second to last sentence:*** These relationships should use the best available scientific information **and the resultant documentation should adequately describe field application and methodology.**

9-6

***Replace pages 9-6 through 9-58 with the following:***

### ICBEMP Interim Implementation Tool—Modified USFWS/ NMFS Matrix

#### *Overview*

Until watershed condition indicators (WCIs) are developed, the interim implementation procedure (modified matrix) in combination with cumulative effects analysis, National Environmental Policy Act (NEPA), Ecosystem Analysis at the Watershed Scale (EAWS; where available), or Subbasin Review, shall be used to help establish an environmental baseline of aquatic resource and watershed condition. Effects of actions shall be evaluated against this baseline to determine consistency with aquatic, riparian, and hydrologic objectives in the ICBEMP Record of Decision. Actions that could negatively affect fundamental physical and ecological processes within a watershed in the long term (more than 10 years) shall be redesigned to be consistent with the aquatic, riparian, and hydrologic objectives.

This interim implementation procedure is to be applied during the NEPA process to facilitate project(s) design and evaluation. Evaluations may be conducted at the site level, at the subwatershed level (6<sup>th</sup>-field HUC) or at the watershed level (5<sup>th</sup>-field HUC), depending on the geographic extent and scope of the proposed action(s), and the scale at which cumulative effects need to be addressed. In any case, the environmental baseline at the subwatershed or watershed scale is the context in which the NEPA analysis of a single action or groups of actions is compared.

None of the concepts or elements used to develop this procedure are new inventions. This multi-scale assessment and evaluation has been adapted from a previous version of a matrix developed by the U.S. Fish and Wildlife Service (USFWS) and the Forest Service: the matrix developed by the National Marine Fisheries Service (NMFS) to determine the effects of actions on listed anadromous fish species and consistency with the ecological goals in PACFISH and the Biological Opinion on LRMP for the eight National Forests in Idaho and eastern Oregon (NMFS, March 1995); and the modified matrix developed by interagency personnel to evaluate consistency of actions with the Aquatic Conservation Strategy (ACS) and to determine effects relative to the Northwest Forest Plan ACS Objectives. The standards and objectives that constitute the aquatic, riparian, and hydrologic component of Alternatives S2 and S3 in the ICBEMP

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strategy are founded on the principles of the ACS for Northwest Forest Plan. It is important to note that this procedure will not result in Endangered Species Act determinations of effect for proposed projects. However, one use of the information obtained from these evaluations can be the incorporation of the information into the subsequent biological assessments that address potential site-specific effects of proposed activities for Endangered Species Act (ESA) determinations.

This two-part evaluation procedure consists of: 1) a matrix table of ecological factors and a suite of integrated indicators, and 2) a checklist for documenting the environmental baseline and effects of the proposed action(s) on the relevant indicators. This procedure is a decision support tool that can assist the land manager in identifying how management actions may potentially influence the conditions and trends of important variables or ecological factors relative to aquatic, riparian, and hydrologic components. The evaluation of an integrated suite of indicators provides a consistent, logical line of reasoning to recognize when and where adverse effects may occur, and why they may occur. It should be noted that this procedure considers the suite of indicators and not individual indicators. Results from the evaluation of the suite of indicators can be used to complete the design of current, proposed activities to avoid adverse impacts and initiate restoration of degraded conditions. This procedure does not replace EAWS. Application of this procedure will help decision makers arrive at an ecologically defensible and trackable determination of the effects of proposed actions relative to aquatic, riparian, and hydrologic objectives in Alternative S2 or S3 of the ICBEMP strategy.

This procedure is designed to be applied through telescoping ranges of scale and over a wide range of environmental conditions, which means it must be flexible. It also means that a certain degree of professional judgement will be required in its application.

### *Description of the Matrix*

The objective of the “Matrix of Factors and Integrated Suite of Indicators” (Table 1) is to integrate the physical habitat conditions to evaluate the potential effects of land management activities in attaining the desired outcomes expected from implementing the aquatic, riparian, hydrologic management direction. This matrix is divided into six overall ecological factors (major rows in the matrix): water quality, habitat access, habitat elements, channel condition and dynamics, watershed conditions, and flow/hydrology.

Each factor represents a significant diagnostic pathway of ecological factors that influence aquatic, riparian, and hydrologic variables that are known to create and maintain good aquatic and riparian habitat conditions. Integration of the conditions for these factors provides the environmental baseline (current condition) of the habitat, and how those conditions may be affected (beneficially or adversely) as a result of an activity(ies). The factors are further broken down into “indicators” and conditions are evaluated in terms of the entire

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integrated suite of indicators and not on individual indicators. The indicators are generally arranged from a finer to a broader scale. For example, under the factor "Habitat Elements," the indicators refer to information from the reach level, (substrate embeddedness), to the grouped reach level (large woody debris, pool frequency and quality, large pools), to the entire stream length (off-channel habitat), and finally the complete watershed (refugia).

Conditions of the indicators are generally reported in one of two ways: (1) quantitative metrics that have associated numeric values (for example, "six pools per mile"); and (2) qualitative descriptions (for example, "adequate habitat refugia do not exist"). It is essential that each ecological factor be addressed using an integrated approach and the purpose of having both types of indicators is that numeric data are not always readily available (or there are no reliable numeric indicators for the factor under consideration). In this case, a description of overall condition may be the only appropriate method available. There will be circumstances where the numeric values or qualitative descriptions for indicators in the matrix simply do not apply to a specific watershed, are unavailable, or exist in a different format. In such a case, a more ecologically appropriate indicator and values can be provided using local data when available, including data sources and techniques used. This substitution will require providing adequate documentation and rationale to justify changes or deletions to the factors and indicators.

The columns in the matrix correspond to levels of condition of the indicator. There are three condition levels: "properly functioning," "at risk," and "not properly functioning." For each indicator, there is either a numeric value or range for a metric that describes the condition, a qualitative description of the condition, or both. When a numeric value and a description are combined in the same cell in the matrix, it is because accurate assessment of the indicator requires attention to both. *The numeric values are not presented as absolute values.* They are presented as diagnostic tools to promote discussion of differences between local data or findings and values suggested in the matrix. Regardless of data availability for each indicator, proposed management activities will be designed to minimize long term impacts to ecological processes which are represented by that indicator.

If a numeric indicator suggested in the matrix is not functionally attainable given the inherent characteristics of the watershed being considered or if an equivalent value is available using a different field technique, the numeric value should be replaced with local data and professional judgement. When this occurs adequate documentation complete with supportive local data and the technique used to compile the data, and/or scientifically supported reasoning, logic, or professional judgement for the change must be included in the

evaluation. Likewise, if not all indicators listed within an ecological factor are used, defensible and trackable documentation on why an indicator was not considered must be included.

### *Description of the Checklist*

The “Checklist for Documenting Environmental Baseline and Consistency of Proposed Action(s) on Relevant Indicators” (Table 2) is designed to be used in conjunction with the matrix. The checklist has six columns. The first three describe the condition of each indicator (which when taken together encompass the environmental baseline and condition of the aquatic, riparian, and hydrologic variables), and the second three describe the effects of the proposed action(s) on each indicator. As with the matrix, documentation and rationale must be provided to support each checklist selection.

### *How to Use the Matrix and Checklist*

The matrix and checklist are used together to help design projects.

For each watershed, determine the environmental baseline by describing the conditions for the measurable indicators listed under ecological factors. This will result in each indicator in Table 1 being classified as either: “Properly Functioning” (PF), “At Risk” (AR), or “Not Properly Functioning” (NPF). The values used to determine PF and NPF should be based on local data collected over time for the indicator that are representative of the physiographic characteristics of the watershed.

Using Table 2, evaluate an action (or groups of actions) by comparing the environmental baseline against the expected effects of the action(s) on the indicators. Where conditions are AR or NPF, actions that affect indicators that are not fully functioning should be designed to improve conditions and processes (through active or passive measures) so indicators are PF in the long term. Where conditions are PF, design the action(s) to maintain those conditions.

Regardless of current conditions actions that would result in short-term impairment of any indicator should be redesigned, unless the short-term impairment of one or more indicators would result in long-term benefits for the affected and other indicators.

Examples: using the attached example tables (intent is to avoid the “go/no go” scenarios)

**Example 1.** Thinning and prescribed fire are proposed as a vegetation treatment. Current large woody debris is 30 pieces per mile, below the Properly Functioning value of 50. Assuming the values for a PF call are appropriate for the physiographic area, the proposed activity will need to be designed in such a way that desired conditions would be reached and lead to attainment of Properly Functioning conditions over the long-term. At the stream reach level, site-specific project design features to promote PF conditions might include increased RCA widths, adjustment of the treatment unit

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boundaries, or changes in how the specific treatment tool (prescribed fire ignitions or mechanical thinning) is implemented.

Example 2. The action is to replace a damaged culvert. Current large woody debris value is 30 pieces per mile, below the Properly Functioning Value of 50. This activity would not affect the condition of the large woody debris indicator. Assuming implementation of the action would not degrade functionality of other indicators over the long-term, the activity could proceed without additional design modifications.

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**Table 1. Example for ABC Physiographic Area Matrix of Factors and Suite of Integrated Indicators.**

FACTORS	INDICATORS	PROPERLY FUNCTIONING (PF)	AT RISK (All situations not described as PF or NPF)	NOT PROPERLY FUNCTIONING (NPF)
Water Quality	Temperature (7 Day Max. Avg.)	≤ 64 Degrees F		≥ 70 Degrees F
	Turbidity	Frequency and duration similar to unimpacted streams in basin		Frequency and duration higher than unimpacted streams in basin
	Chemical Contamination/ Nutrients	No biological evidence of chemical contamination		Obvious biological evidence of chemical contamination, for example, fish kills
Habitat Access	Physical Barriers	No human-created barriers in watershed that inhibit upstream passage of any life stage of salmonid to its historical habitat		One or more human-created barriers that prevent upstream passage of any life stage of salmonid to its historical habitat
Habitat Elements	Substrate/ Sediment	≥ 30% gravel in riffles and very little embeddedness		≤ 10% gravel in riffles and embedded
	Large Woody Debris (LWD)	≥ 50 pieces/mile, 24" dia., 50' long, no evidence or record of stream clean out or management related debris flows		≤ 15 pieces/mile, 24" dia., 50' long, evidence or record of stream clean out or management related debris flows
	Pool Area %	≥ 55%		≤ 40%
	Pool Quality	Residual pool depth ≥ 0.5 m or 20% pools deeper than 1 m.		Residual pool depth ≤ 0.2 m or 10% pools deeper than 1 m.
	Off-channel Habitat	Frequent backwaters with cover, and low energy off-channel areas (ponds oxbows, etc.)	Some backwaters and high energy side channels	No backwaters, nor off-channel ponds.
Channel Condition and Dynamics	Width/depth ratio (in wetted riffles)	< 15	15 - 30	> 30
	Streambank Condition	Relatively stable banks. Few or no areas of active erosion.	Moderately stable banks. Some active erosion occurring on outcures and constrictions.	Highly unstable stream banks. Numerous areas of exposed soil and stream bank cutting.
	Floodplain Connectivity	Logjams and other features create pools and secondary channels, which trap debris and food and maintain a high water table that provides cool late-season flows. Floodplain well vegetated.		Secondary channels lacking. Unconstrained main channel often down cut to bedrock and relatively short, without pools, meanders, and food. Warm low late-season flows.

**Table 1. Example for ABC Physiographic Area Matrix of Factors and Suite of Integrated Indicators. (Continued)**

FACTORS	INDICATORS	PROPERLY FUNCTIONING (PF)	AT RISK (All situations not described as PF or NPF)	NOT PROPERLY FUNCTIONING (NPF)
Watershed Condition	Road Density and Location/ Drainage Network	< 2 miles/square miles. No valley bottom roads.	2 - 3 miles/square miles. Some valley bottom roads.	> 3 miles/square miles. Many valley bottom roads.
	Disturbance History	Entire watershed with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or riparian reserves; and for NWFP area (except Adaptive Management Areas), $\geq 15\%$ retention of LSOG in watershed.		Entire watershed with disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian reserves; does not meet NWFP standard for LSOG retention.
	Landslide Rates	No obvious increase in landslide rates caused from management related activities		> 2X natural rate of landslides, that appears to be management related.
	Riparian Reserves	The riparian reserve system provides adequate shade, large woody debris recruitment, and habitat protection and connectivity in all subwatersheds, and buffers include known refugia for sensitive aquatic species (> 80% intact).	Moderate loss of function (shade, LWD recruitment, etc.) of riparian reserve system, or incomplete protection of habitats and refugia for sensitive aquatic species (~70-80% intact).	Riparian reserve system is fragmented, poorly connected, or provides inadequate protection of habitats and refugia for sensitive aquatic species (<70% intact).

The ranges of values listed in the above table are for example only. Ranges of values for indicators that are based on actual data and are appropriate for the physiographic region will need to be identified by local units and interagency specialists.

Abbreviations used in this table:

F = Fahrenheit

dia = diameter

m = meter

NWFP = Northwest Forest Plan

LSOG = Late Seral Old Growth

LWD = large woody debris

**Table 2. Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Factors and Indicators.**

ECOLOGICAL FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
	Properly <sup>1</sup> Functioning	At Risk <sup>1</sup>	Not Properly <sup>1</sup> Functioning	Restore <sup>2</sup>	Maintain <sup>3</sup>	Degrade <sup>4</sup>
<u>Water Quality:</u> Temperature						
Sediment						
Chem. Contam./Nut.						
<u>Habitat Access:</u> Physical Barriers						
<u>Habitat Elements:</u> Substrate						
Large Woody Debris						
Pod Area %						
Pod Quality						
Off-channel Habitat						
<u>Channel Cond. &amp; Dyn:</u> Width/Depth Ratio						
Streambank Condition						
Floodplain Connectivity						
<u>Flow/Hydrology:</u> Peak/Base Flows						
Drainage Network Increase						
<u>Watershed Conditions:</u> Road Dens. & Loc.						
Disturbance History						
Landslide Rates						
Riparian Reserves						

Watershed Name:

Location:

<sup>1</sup> These three categories of function ("properly functioning", "at risk", and "not properly functioning") are defined for each indicator in the "Matrix of Pathways and Indicators" (Table 1).

<sup>2</sup> For the purposes of this checklist, "restore" means to change the function of an "at risk" indicator to "properly functioning", or to change the function of a "not properly functioning" indicator to "at risk" or "properly functioning" (that is, it does not apply to "properly functioning" indicators).

<sup>3</sup> For the purposes of this checklist, "maintain" means that the function of an indicator does not change (that is, it applies to all indicators regardless of functional level).

<sup>4</sup> For the purposes of this checklist, "degrade" means to change the function of an indicator for the worse (that is, it applies to all indicators regardless of functional level). In some cases, a "not properly functioning" indicator may be further worsened, and this should be noted.

