

APPENDIX D. DEFINITIONS AND TERMINOLOGY FOR ASSESSING THE LEVELS OF ENVIRONMENTAL EFFECTS

These definitions were used in the evaluation of key effects. They do not address potential effects on endangered species; such effects would need to be addressed through processes outlined in the endangered species act. They also do not address the scientific uncertainty associated with an effect. Uncertainty was a separate consideration.

Levels of Effects

Extreme: Effects that alter ecosystem character and significantly change natural resource values. These effects are persistent, strong (intensive and extensive), and highly diverse. An example would be effects that convert a macrophyte-dominated ecosystem to one dominated by phytoplankton.

Major: Effects that alter one or more ecosystem components and significantly change natural resource values but do not alter ecosystem character. These effects are persistent and strong but they are not highly diverse. An example would be effects that significantly reduce the population size of a commercially important species or significantly reduce the coverage of SAV.

Moderate: Effects that alter one or more ecosystem components but do not significantly reduce natural resource values. These effects are ephemeral or weak. An example would be an infrequent reduction in SAV coverage that persists for a relatively short time or a stronger and more persistent effect on a minor species.

Minor: Effects that do not significantly alter any ecosystem component. These effects are ephemeral and weak. Natural resource values are unaffected. An example would be a weak or ephemeral reduction in the population size of a minor species or effects on an exotic species.

Negligible: Effects that do not appreciably alter any ecosystem component. Components with negligible effects are essentially unresponsive to water withdrawals.

Terminology

Attribute (state variable) – a measurable characteristic of an ecosystem that varies with the state of the ecosystem

Augmentation effect – a hydrologic and/or hydrodynamic effect associated with augmentation of discharge above the base condition; augmentation effects cannot be causally linked to a water withdrawal

Conceptual Model – a path diagram that illustrates hypothesized causative linkages among attributes

Driver – an attribute causally correlated with another attribute as an independent variable

Ecosystem - the physical, chemical, and biological aspects of a segment of the river or of the river as a whole.

Ecosystem character – the fundamental structure and functions of an ecosystem

Ecosystem component – a single aspect of an ecosystem’s structure or function

Ecosystem function – a component of the work performed by an ecosystem that influences energy flows or elemental cycling or maintenance of biodiversity (e.g. carbon and energy fixation, energy transfers among trophic levels, chemical transport and transformation, materials cycling, predation, competition)

Ecosystem structure – the species composition and interrelationships among species including species diversity, the species dominance pattern, species identities, and trophic relationships

Effect – a change in an attribute elicited by a forcing

Effects Diversity – the breadth of ecosystem components or species affected

Effects Persistence – the duration of an effect relative to its return frequency

Effects Strength – the intensity and spatial magnitude of an effect. The strongest effects are intense and extensive.

Forcing – a change in state of a driver; the potential for an effect on attributes increases with the magnitude of the forcing (i.e., the deviation from an antecedent condition in the state of a driver)

Hydroecological model – a mechanistic or empirical model linking the status of an ecosystem attribute and an H&H driver

Key attribute – an attribute that is a driver for many other state variables or that is economically significant in and of itself

Key effect - an effect on a key attribute

Minor species – a species that is not endemic, rare in the river, listed, keystone, or with no functional equivalent and that has no direct economic value and plays no significant role in the maintenance of commercially-important species

Natural Resource value – a good (such as food) or service (such as denitrification) important to ecosystem functions, human commerce and economy, health, or quality of life

Reduction effect – a hydrologic and/or hydrodynamic effect associated with reduction of discharge below the base condition; reduction effects may be causally linked to a water withdrawal.