

## **STEPS TO DESIGNATE AN ECOLOGICAL SURROGATE FOR HARM TO LISTED SPECIES FROM HABITAT DISTURBANCE**

This document provides non-regulatory, interpretive guidance for biologists in the NMFS West Coast Region California Central Valley Area Office to use while preparing incidental take statements for biological opinions, and it is not intended to be binding on members of the public or the agency.

### **Step 1:**

[State why it is not practical for you to quantify or track the amount or number of individuals to be incidentally taken (50 CFR 402.14(i)(1)(i)). The reason why will vary, depending on the action area, species involved, type of action, etc.]

E.g.: It is not practical to quantify or track the amount or number of individuals that are expected to be incidentally taken per species as a result of the proposed action due to the variability associated with the response of listed species to the effects of the proposed action, the varying population size of each species, annual variations in the timing of spawning and migration, individual habitat use within the action area, and difficulty in observing injured or dead fish.

### **Step 2:**

[State that you will use an ecological surrogate(s) to describe the level of take expected to occur, and that it is practical to quantify and monitor the surrogate to determine the extent of incidental take that is occurring]

E.g.: However, it is possible to estimate the extent of incidental take by designating an ecological surrogate(s), and it is practical to quantify and monitor the surrogate(s) to determine the extent of incidental take that is occurring.

### **Step 3:**

[State what the surrogate is. Provide sufficient details about the specific type(s) and extent of habitat disturbance that is expected to occur in order to facilitate setting a clear standard for determining when the level of anticipated take has been exceeded (see Step 6). Use a single surrogate for more than one type of take if a causal link between the surrogate and those types of take can be explained (e.g. 2 below)]

E.g. 1: The most appropriate thresholds for the extent of incidental take that is expected to occur during powerhouse and canal outages are ecological surrogates of temporary habitat disturbance (with added details about the specific type(s) and extent of habitat disturbance that is expected to occur; e.g., increased flows to certain levels).

E.g. 2: The most appropriate threshold for incidental take is an ecological surrogate of temporary habitat disturbance expected to occur, during the riffle supplementation method of gravel

augmentation, floodplain and side channel excavation, habitat structure placement, and project site maintenance in the amount of [x area].

#### **Step 4:**

[Describe how the disturbance to habitat relates to incidental take of listed species, i.e., describe the causal link between the surrogate and take of the listed species (50 CFR 402.14(i)(1)(i)). This will usually be written out in several statements]

E.g. 1: The behavioral modifications or fish responses that result from the habitat disturbance are described below. NMFS anticipates annual incidental take will be limited to the following forms:

1. Prespawn mortality of adult SR winter-run and CV spring-run Chinook salmon, from temporary disturbance to habitat during outages resulting in high flows such that Chinook salmon migrating to holding/spawning habitat are reasonably certain to be falsely attracted to less suitable habitat and/or non-natal habitat during an outage.
2. Death to incubating eggs from CCV steelhead, SR winter-run and CV spring-run Chinook salmon during outages. Outages will result in higher flows downstream, which are reasonably certain to result in entombment from sediment mobilization, scour of redds, or redds becoming dewatered when flows recede (as outages come back online).

E.g. 2: Disruption of habitat utilization may cause fish behavioral modifications leading to harm as described below. NMFS anticipates annual incidental take will be limited to the following forms:

1. Harm to juvenile CV steelhead, winter-run and spring-run Chinook salmon, and green sturgeon, from temporary disruption of 1,100 foot sections of mid-channel riffle rearing habitat due to gravel augmentation, plus 200 feet for turbidity plume, equaling 1,300 feet. Placement of up to 20,000 cubic yards of spawning gravel per project site, up to three sites per year. The disruption will affect the behavior of listed fish, including migration delay; displacement, which is reasonably certain to result in increased predation risk resulting in decreased survival; decreased feeding resulting in reduced growth; and increased competition, resulting in reduced fitness.

#### **Step 5 (optional)**

[Include any additional information to help inform the extent of take – proportion of a population affected; approximate density of juveniles in the area; etc.]

E.g.: Assumptions include anticipated density of rearing juvenile salmonids, based on snorkel surveys in the upper Sacramento River, which averaged approximately 0.05 salmon per foot and 0.04 rainbow trout/steelhead per foot in riffle habitat. There are no data available for juvenile green sturgeon densities, but their density is likely less than half the density of salmon juveniles in the action area; therefore, 0.025 per foot will be used.

## **Step 6**

[State how/when take is exceeded. Set a clear standard for determining when the level of anticipated take has been exceeded (50 CFR 402.14(i)(1)(i)).]

E.g. 1: Incidental take will be exceeded if outages occur at a different timing, greater frequency, or greater duration than as described in Table 3 of this BO.

E.g. 2: Incidental take will be exceeded if the amount of habitat disturbance described in the surrogate is exceeded.

## **Step 7 (if applicable)**

[If an ecological surrogate of habitat disturbance is coextensive with the project's scope, explain how the action agency or applicant will be required to monitor the project impacts relative to the surrogate during the course of the action, which will determine whether the impacts are consistent with the analysis in the biological opinion, and reinitiation of consultation will be triggered if the extent of the anticipated taking specified in the incidental take statement is exceeded during the course of the action.]

E.g. 1: As the disturbance of [x area] of riparian habitat is expected to occur during floodplain and side channel excavation, [action agency/applicant] will be required to monitor the amount of riparian habitat disturbed and cease operations and notify NMFS if that amount is exceeded to discuss.