

SECTION 9.0

CONCLUSIONS AND DETERMINATIONS

This section contains the conclusions and determinations regarding whether the Proposed Action is likely to adversely affect spring-run Chinook salmon, steelhead or green sturgeon, or their designated critical habitats, within the Action Area. The conclusions in this Applicant-Prepared Draft BA are based on the best scientific and commercial data available, and are intended to assist NMFS in reaching its determinations regarding project-related effects to listed fish species and their designated critical habitats during the formal ESA consultation process.

According to USFWS and NMFS (1998), the following three possible determinations exist regarding a proposed action's effects on listed fish species or their designated critical habitats under the ESA:

No effect – “No effect” is the appropriate conclusion when it is determined that the proposed action will not affect a listed fish species or designated critical habitat.

May affect, but is not likely to adversely affect – “May affect, but is not likely to adversely affect” is the appropriate conclusion when effects on ESA protected species are expected to be discountable, insignificant, or completely beneficial. “Insignificant effects relate to the size of the impact, and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur (USFWS and NMFS 1998).”

May affect, is likely to adversely affect – “May affect, is likely to adversely affect” is the appropriate conclusion if any adverse effect to listed fish species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant or beneficial. In fact, even if the overall effect of the proposed action is beneficial to an ESA-protected species, if it also is likely that the proposed action will cause some adverse effects, then the proposed action “is likely to adversely affect” the listed fish species. If incidental take is anticipated to occur as a result of the proposed action, an “is likely to adversely affect” determination should be made (USFWS and NMFS 1998).¹

The analyses presented in Section 8.0 of this Applicant-Prepared Draft BA were conducted to assist NMFS in making these determinations and in determining whether the Proposed Action will cause “...some deterioration in the species' pre-action condition” (*National Wildlife Federation v. NMFS*, 524 F.3d 917, 930 (9th Cir. 2008)).

¹ As discussed in Section 3.3, this Applicant-Prepared Draft BA uses the term “may adversely affect” for components of the Proposed Action that may affect listed species or their designated critical habitats where the potential effects are not completely discountable, insignificant or beneficial.

9.1 Listed Fish Species

9.1.1 Central Valley Spring-run Chinook Salmon

For the ESU-wide Environmental Baseline effects assessment for spring-run Chinook salmon, NMFS (2009b) found that the entire suite of limiting factors, threats and stressors associated with the Environmental Baseline have resulted in an unstable ESU that has moderate risk of extinction. Therefore, spring-run Chinook salmon would not be expected to be able to tolerate additional stressors associated with a proposed new action that would be substantial enough to adversely affect spring-run Chinook salmon at the ESU level.

For the lower Yuba River, the NMFS (2016) status review for spring-run Chinook salmon suggests that the spring-run Chinook salmon population's size meets the low extinction risk criteria for abundance (ranging from a few hundred to a few thousand fish). However, the estimated number of spring-run Chinook salmon passing Daguerre Point Dam during 2015 was the lowest for all 12 years of available VAKI RiverwatcherTM data. Moreover, the RMT (2013a) questions the applicability of any of these criteria addressing extinction risk, because they presumably apply to independent populations and, as previously discussed, lower Yuba River anadromous salmonids represent introgressive hybridization of larger Feather-Yuba river populations, with substantial contributions of hatchery-origin fish to the annual runs. Thus, NMFS (2016) states that the population is likely at high extinction risk due to hatchery influence.

Overall, consideration of the available data including estimated abundance, trends, and particularly hatchery contribution suggests that the lower Yuba River spring-run Chinook salmon population is at a moderate to high extinction risk. Given the above considerations, it is reasonable to conclude that spring-run Chinook salmon in the lower Yuba River have a limited capacity to tolerate additional incremental adverse effects associated with a specific action.

9.1.2 Central Valley Steelhead

For the DPS-wide Environmental Baseline effects assessment of steelhead, NMFS (2016a) found that the entire suite of limiting factors, threats and stressors associated with the Environmental Baseline have resulted in an unstable DPS that has high risk of extinction (Williams et al. 2011; Williams et al. 2016). NMFS (2016a) indicated that the biological status of the DPS has declined since the previous status review in 2011. According to NMFS (2016a), there are indications that natural production of steelhead continues to decline and is now at a very low levels. Due to this declining trend, NMFS (2016a) suggests that the DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Therefore, steelhead would not be expected to be able to tolerate additional stressors associated with a proposed new action that would be substantial enough to adversely affect steelhead at the DPS level.

In the 5-Year status review (May 2016) of the California Central Valley steelhead DPS, NMFS (2016a) did not specifically address the lower Yuba River population of steelhead, nor did the July 2016 Viability Assessment (Williams et al. 2016). Overall, consideration of the available data, estimated abundance, trends and hatchery contribution indicates that the lower Yuba River

steelhead population is at a high extinction risk. Given the above considerations, it is reasonable to conclude that steelhead in the lower Yuba River have a limited capacity to tolerate additional incremental adverse effects associated with a specific action.

9.1.3 North American Green Sturgeon

For the Central Valley Domain of green sturgeon, currently there are limited data on population sizes, population trends, or productivity (NMFS 2015). Nonetheless, NMFS (2016b) concluded that the risk of extinction for the Southern DPS of green sturgeon under the Environmental Baseline is moderate because, although threats due to habitat alteration are thought to be high, and although indirect evidence suggests a decline in abundance, there is much uncertainty regarding the scope of threats and the viability of population abundance indices. Therefore, it is reasonable to assume that green sturgeon would not be expected to be able to tolerate additional stressors associated with a proposed new action that would be substantial enough to adversely affect green sturgeon at the DPS level.

The infrequent sightings of green sturgeon in the lower Yuba River and the limited amount of information about these fish preclude any analyses of abundance, productivity, habitat utilization, life history or behavioral patterns of green sturgeon in the lower Yuba River. Consequently, this Applicant-Prepared Draft BA's analyses of the effects of the Proposed Action on green sturgeon are limited to evaluations of whether or not potential habitat changes downstream of Daguerre Point Dam would have the potential to adversely affect green sturgeon designated critical habitat.

9.2 Potential Effects of the Proposed Action

This Applicant-Prepared Draft BA gives systematic consideration to whether each of the constituent components of the Proposed Action has the potential to contribute to changes in flow, water temperature, or other habitat conditions in the lower Yuba River (see Section 3.3 of this Applicant-Prepared Draft BA). Due to the interconnectivity of individual constituent components and the inherent variations in biological responses to suites or combinations of the constituent components of the Proposed Action, for this Applicant-Prepared Draft BA the incremental effects of the constituent components are consolidated and evaluated as overall stressors to individuals, populations, and critical habitats. In the determination section (Section 9.3 of this Applicant-Prepared Draft BA), conclusions regarding the effects of the Proposed Action in its entirety on listed species and their critical habitat are provided.

This Applicant-Prepared Draft BA has analyzed the changes in the frequencies and magnitudes of stressors to the listed species (individuals, populations, and their designated critical habitats) in the Action Area that are expected to occur under the Proposed Action, relative to the Environmental Baseline (see Section 8.0 of this Applicant-Prepared Draft BA). Summaries of these evaluations are provided below. The stressors included in the evaluations emanate from the Environmental Baseline and not the Proposed Action. The evaluation addresses whether these Environmental Baseline stressors would be exacerbated or alleviated by implementation of the Proposed Action.

According to NMFS (2016c), the analysis of potential effects to individual fish should be separate from the analysis of potential effects on critical habitats. NMFS states that a BA should first analyze potential impacts to individuals of a species, and then analyze potential impacts to the PBFs of designated critical habitats in the Action Area. Accordingly, stressor effects on individuals of the populations are presented here, separately from stressor effects on designated critical habitats, below.

9.2.1 Potential Effects to Individuals of the Listed Species

9.2.1.1 Spring-run Chinook Salmon

9.2.1.1.1 Flow-Dependent Conditions

Potential Redd Dewatering

Spring-run Chinook salmon redd dewatering under the Proposed Action scenario is estimated to be very low and similar to that under the Environmental Baseline. The average annual probabilities of redd dewatering for both the Environmental Baseline and the Proposed Action are less than 0.03 percent over the long-term and by WYT, and do not vary between the Environmental Baseline and the Proposed Action by more than 0.01 percent. Redd dewatering under the Environmental Baseline is characterized as a low stressor to spring-run Chinook salmon, and it would remain as a low stressor under the Proposed Action.

Fry and Juvenile Stranding and Isolation

It is expected that, under the Proposed Action, the potential for fry and juvenile stranding would be minimized with implementation of Proposed Condition AR9, *Control Project Ramping and Flow Fluctuations Downstream of Englebright Dam*. The proposed lower maximum authorized ramping rates under the Proposed Action also are anticipated to reduce the potential for juvenile isolation in the lower Yuba River under the Proposed Action, relative to the Environmental Baseline.

Under the Environmental Baseline, fry and juvenile stranding and isolation is a stressor of moderate magnitude to spring-run Chinook salmon. Because the Proposed Action is anticipated to reduce the potential for spring-run Chinook salmon fry and juvenile stranding and isolation, the Proposed Action is expected to reduce the magnitude and exposure of this stressor to spring-run Chinook salmon. Therefore, this stressor is expected to be reduced to a low to moderate magnitude stressor to spring-run Chinook salmon in the lower Yuba River under the Proposed Action.

9.2.1.1.2 Narrows 2 Operations

Under the Proposed Action, proposed changes to Narrows 2 operations include changes to conference year flows, flow fluctuation criteria, and coordinated operations with the Narrows Project. Potential effects associated with Narrows 2 operations include redd dewatering and fry

and juvenile stranding and isolation, as discussed above. The potential expressions of stressors (i.e., redd dewatering, fry and juvenile stranding and isolation, changes in flows and water temperatures, and flow-dependent habitat conditions) associated with Narrows 2 operations are evaluated independently.

Potential effects to adult spring-run Chinook salmon appear to be localized to the proximate vicinity of the Narrows 2 facilities. Narrows 2 operations have the potential to adversely affect adult spring-run Chinook salmon holding. There have been observations of adult Chinook salmon apparently confined in an isolated pool in the channel near Narrows 2 Powerhouse. Measures have been taken to physically restructure the potential isolation areas, and monitoring, reporting and fish rescue procedures have been developed. Under the Environmental Baseline, Narrows 2 operations are characterized as a low stressor, and would remain a low stressor to spring-run Chinook salmon under the Proposed Action.

9.2.1.1.3 Other Stressors

Other stressors to spring-run Chinook salmon individuals or populations occur under the Environmental Baseline. The magnitudes of these stressors are described and evaluated in Sections 5.0 and 6.0 of this Applicant-Prepared Draft BA. Potential changes in the magnitudes of these stressors with implementation of the Proposed Action are discussed in Section 8.0. The following stressors would not be directly or indirectly affected by the Proposed Action, and their stressor level categorizations do not change under the Proposed Action relative to their characterizations under the Environmental Baseline.

- Harvest/Angling (Low)
- Poaching (High)
- Hatchery Effects (High)
- Entrainment
 - BVID (Low)
 - Hallwood-Cordua Diversion and South Yuba/Brophy Diversion (Low)
- Predation (Moderate to High)

9.2.1.2 Steelhead

9.2.1.2.1 Flow-Dependent Conditions

Potential Redd Dewatering

Steelhead redd dewatering under the Proposed Action is estimated to be similar to that under the Environmental Baseline. The potential for steelhead redd dewatering (about 19 percent long-term average) is higher than that for spring-run Chinook salmon. Proposed Condition AR9, *Control Project Ramping and Flow Fluctuation Downstream of Englebright Dam*, was developed in part to minimize the potential for steelhead redd dewatering, during the period from January 1 through May 31 (corresponding to the steelhead spawning and incubation period). The relatively high potential redd dewatering for steelhead is primarily due to high flow events (storm flows),

which exceed the combined total flow capacity at Narrows 1 and Narrows 2 (4,130 cfs) that occur during the steelhead spawning and incubation period, and due to redd dewatering during those days when the conditions associated with Proposed Condition AR9 would not apply. During the days over the 41-year period of evaluation when this proposed condition would apply, it would provide the intended protection for steelhead redd dewatering (about 1 percent or less).

Under the Environmental Baseline, potential steelhead redd dewatering is characterized as a moderate to high stressor, and would remain as a moderate to high stressor under the Proposed Action. Potential steelhead redd dewatering would not be exacerbated by the Proposed Action.

Fry and Juvenile Stranding and Isolation

Under the Environmental Baseline, fry and juvenile stranding and isolation is a stressor of moderate magnitude to steelhead. Because the Proposed Action is anticipated to reduce the potential for fry and juvenile stranding and isolation, the Proposed Action is expected to reduce the magnitude of this stressor and the potential effects of this stressor on steelhead. Therefore, this stressor is expected to be reduced to a low to moderate magnitude stressor to steelhead in the lower Yuba River under the Proposed Action.

9.2.1.2.2 Narrows 2 Operations

As discussed above, the potential expressions of stressors (i.e., redd dewatering, fry and juvenile stranding and isolation, changes in flows and water temperatures, and flow-dependent habitat conditions) associated with Narrows 2 operations are evaluated independently. Potential effects to adult steelhead would be expected to be localized to the proximate vicinity of the Narrows 2 facilities. Unlike spring-run Chinook salmon, however, there have not been observations of adult steelhead apparently confined in an isolated pool in the channel near Narrows 2 Powerhouse, although that potential exists. The measures taken to physically restructure the potential isolation areas, and the monitoring, reporting and fish rescue procedures developed for spring-run Chinook salmon would also apply for steelhead. Under the Environmental Baseline, Narrows 2 operations are characterized as a low stressor, and would remain a low stressor to steelhead under the Proposed Action.

9.2.1.2.3 Other Stressors

Other stressors to steelhead individuals or populations occur under the Environmental Baseline. The magnitudes of these stressors are described and evaluated in Sections 5.0 and 6.0 of this Applicant-Prepared Draft BA. Potential changes in the magnitudes of these stressors with implementation of the Proposed Action are discussed in Section 8.0. The following stressors would not be directly or indirectly affected by the Proposed Action, and their stressor level categorizations do not change relative to their characterizations under the Environmental Baseline.

- Harvest/Angling (Low)
- Poaching (Moderate)
- Hatchery Effects (High)

- Entrainment
 - BVID (Low)
 - Hallwood-Cordua Diversion and South Yuba/Brophy Diversion (Moderate)
- Predation (Moderate to High)

9.2.1.3 Summary of Potential Effects to Individuals of the Listed Species

The Proposed Action would not introduce new stressors, or substantially exacerbate ongoing stressors under the Environmental Baseline, to spring-run Chinook salmon or steelhead individuals or populations in the lower Yuba River. Slight changes in the stressors may occur under the Proposed Action relative to the Environmental Baseline. However, as thoroughly evaluated and discussed in Section 8.0 of this Applicant-Prepared Draft BA, these slight changes would not be of sufficient magnitude or frequency to adversely affect spring-run Chinook salmon or steelhead. Implementation of YCWA's proposed conditions under the Proposed Action would be expected to reduce the potential for redd dewatering, and fry and juvenile stranding and isolation.

9.2.2 Potential Effects to Designated Critical Habitats

9.2.2.1 Spring-run Chinook Salmon

PBFs of designated spring-run Chinook salmon critical habitat in the lower Yuba River include freshwater spawning sites, freshwater rearing sites, and freshwater migration corridors. Descriptions and considerations of the PBFs of spring-run Chinook salmon critical habitat in the Action Area are presented in Section 5.0 of this Applicant-Prepared Draft BA. Extensive evaluations and discussions of the potential effects of the Proposed Action on the PBFs of spring-run Chinook salmon in the Action Area, including the frequencies and magnitudes of potential effects, are provided in Section 8.0 of this Applicant-Prepared Draft BA. A summary of these evaluations is provided here.

9.2.2.1.1 Flow-Dependent Conditions

Spawning Habitat

Spring-run Chinook salmon spawning habitat availability under the Proposed Action is generally similar to that under the Environmental Baseline, and the Proposed Action would provide more habitat during conference WYs. The Proposed Action would provide very similar (within 0.5 percent) amounts of spawning habitat over the long-term and by WYT, although more habitat (2.8 percent) would be provided during critical WYs under the Proposed Action, relative to the Environmental Baseline. Under the Environmental Baseline, spring-run Chinook salmon spawning habitat is characterized as a low stressor, and it also would be a low stressor under the Proposed Action.

Fry and Juvenile Flow-Dependent Rearing Habitat

Long-term average fry and juvenile rearing in-channel habitat availability (percent of maximum WUA) in the lower Yuba River is the same under the Proposed Action and Environmental Baseline scenarios. There would be very similar amounts of in-channel rearing habitat by WYT under the Proposed Action and the Environmental Baseline.

For the entire simulation period, very similar amounts of long-term average and WYT-specific fry and juvenile rearing full-flow habitat (average WUA) would be available under the Proposed Action, relative to the Environmental Baseline.

Flow-dependent fry and juvenile rearing habitat availability under the Environmental Baseline represents a low stressor to spring-run Chinook salmon, and would remain as a low stressor under the Proposed Action.

9.2.2.1.2 Water Temperature Suitability

Water temperature exceedance probabilities are very similar (i.e., the differences in exceedance are less than 1%) under the Proposed Action and Environmental Baseline during the fall through spring months (i.e., October through May) for all lifestages of spring-run Chinook salmon. Some differences in simulated water temperatures would occur during the spring-run Chinook salmon adult holding, and juvenile rearing and downstream movement lifestages. For all months of the year, no lifestage-specific WTI values would be exceeded with a 10 percent or greater probability at any of the three evaluated locations more often under the Proposed Action, relative to the Environmental Baseline. Overall, water temperatures under the Proposed Action would be similar to those under the Environmental Baseline, and would be a low stressor to Yuba River spring-run Chinook salmon.

9.2.2.1.4 Other Stressors

Other stressors to spring-run Chinook salmon designated critical habitat occur under the Environmental Baseline. The magnitudes of these stressors are described and evaluated in Sections 5.0 and 6.0 of this Applicant-Prepared Draft BA. Potential changes in the magnitudes of these stressors with implementation of the Proposed Action are discussed in Section 8.0. The following stressors would not be directly or indirectly affected by the Proposed Action, and their stressor level categorizations therefore do not change under the Proposed Action, relative to the Environmental Baseline.

- Passage Impediments/Barriers
 - Englebright Dam (Very High)
 - Daguerre Point Dam (High)
- Physical Habitat Alteration (Low to Moderate)
- Fry and Juvenile Rearing Physical Habitat Structure (High)
- Riparian Habitat and Instream Cover (Moderate to High)
- Natural River Morphology and Function (High)

- Floodplain Habitat Availability (High)

9.2.2.2 Steelhead

As for spring-run Chinook salmon, PBFs of designated steelhead critical habitat in the lower Yuba River include freshwater spawning sites, freshwater rearing sites, and freshwater migration corridors (described in Section 5.0 of this Applicant-Prepared Draft BA). Extensive evaluations and discussions of the potential effects of the Proposed Action on the PBFs of steelhead in the Action Area, including the frequencies and magnitudes of potential effects, are provided in Section 8.0 of this Applicant-Prepared Draft BA. A summary of these evaluations is provided here.

9.2.2.2.1 Flow-Dependent Conditions

Spawning Habitat

The Proposed Action would provide the same amount of long-term average steelhead spawning habitat availability as under the Environmental Baseline, and would provide similar amounts of spawning habitat during conference WYs. The Proposed Action would provide very similar (within 0.4 percent) amounts of spawning habitat by WYT, relative to the Environmental Baseline. Under the Environmental Baseline, steelhead spawning habitat is characterized as a low stressor, and would remain as a low stressor under the Proposed Action.

Fry and Juvenile Flow-Dependent Rearing Habitat

Long-term average fry and juvenile rearing in-channel habitat availability (percent of maximum WUA) in the lower Yuba River is very similar under the Proposed Action and the Environmental Baseline. The Proposed Action would result in very similar amounts of in-channel rearing habitat by WYT, relative to the Environmental Baseline. The Proposed Action would provide slightly more habitat than the Environmental Baseline during critical WYs.

For the entire simulation period, very similar amounts of long-term average and WYT-specific fry and juvenile rearing full-flow habitat (average WUA) would be available under the Proposed Action relative to the Environmental Baseline. The Proposed Action would provide slightly more habitat than the Environmental Baseline during critical WYs.

Flow-dependent fry and juvenile rearing habitat availability under the Environmental Baseline represents a low stressor to steelhead, and would remain as a low stressor under the Proposed Action.

9.2.2.2.2 Water Temperature Suitability

Water temperature exceedance probabilities generally would be similar under the Proposed Action, relative to the Environmental Baseline, for all lifestages of steelhead. Relatively minor differences in the probabilities of water temperatures exceeding specified WTIs would occur for each lifestage. For all months of the year, no lifestage-specific WTI values would be exceeded

more often with a 10 percent or greater probability at any of the three evaluated locations under the Proposed Action, relative to the Environmental Baseline. Overall, under the Environmental Baseline, water temperatures are a low stressor to Yuba River steelhead. Although minor increases and decreases in simulated water temperatures with low probabilities of occurrence would occur under the Proposed Action relative to the Environmental Baseline, this stressor would remain a low stressor under the Proposed Action.

9.2.2.2.3 Other Stressors

Other stressors to steelhead designated critical habitat occur under the Environmental Baseline. The following stressors would not be directly or indirectly affected by the Proposed Action, and their stressor level categorizations would not change under the Proposed Action, relative to the Environmental Baseline.

- Passage Impediments/Barriers
 - Englebright Dam (Very High)
 - Daguerre Point Dam (High)
- Physical Habitat Alteration (Low to Moderate)
- Fry and Juvenile Rearing Physical Habitat Structure (High)
- Riparian Habitat and Instream Cover (Moderate to High)
- Natural River Morphology and Function (High)
- Floodplain Habitat Availability (High)

9.2.2.3 Summary of Potential Effects to Designated Critical Habitats of the Listed Species

Slight changes in the flow-related habitat availability and suitability, and water temperature suitability may occur under the Proposed Action relative to the Environmental Baseline. However, as thoroughly evaluated and discussed in Section 8.0 of this Applicant-Prepared Draft BA, these slight changes would not be of sufficient magnitude or frequency to adversely affect designated critical habitats of spring-run Chinook salmon or steelhead in the lower Yuba River.

The Proposed Action would not result in any substantial changes to designated critical habitat for Central Valley spring-run Chinook salmon or California Central Valley steelhead in the Action Area. No substantial increases in the intensity, frequency, and duration of stressors to spring-run Chinook salmon or steelhead designated critical habitats in the lower Yuba River would occur under the Proposed Action, relative to the Environmental Baseline.

9.2.2.4 Green Sturgeon Designated Critical Habitat

PBFs for the Southern DPS of North American green sturgeon designated critical habitat include specific features of freshwater riverine systems, estuarine habitats, and nearshore coastal marine waters (74 FR 52300, October 9, 2009). PBFs for green sturgeon critical habitat identified as being present in the lower Yuba River include water depth, flow, passage and water quality (74

FR 52328, October 9, 2009). Descriptions and considerations of the PBFs of green sturgeon critical habitat in the Action Area are presented in Section 5.0 of this Applicant-Prepared Draft BA.

Freshwater riverine systems are used by green sturgeon for spawning and for adult holding after spawning. The green sturgeon eggs hatch in freshwater, and the larvae spend their initial days and weeks in freshwater, migrating to estuarine areas in a relatively short time (NMFS 2016b). Extensive evaluations and discussions (including the frequencies and magnitudes) of the potential effects of the Proposed Action on green sturgeon pre- and post-spawning adult holding habitat and spawning habitat, as well as water temperature suitabilities, in the lower Yuba River are provided in Section 8.0 of this Applicant-Prepared Draft BA.

Slight changes in flow-related habitat availability and suitability, and water temperature suitability, may occur under the Proposed Action relative to the Environmental Baseline. However, as thoroughly evaluated and discussed in Section 8.0 of this Applicant-Prepared Draft BA, the Proposed Action would not result in any substantial changes to designated critical habitat for North American green sturgeon in the lower Yuba River. No substantial increases in the intensity, frequency, and duration of effects to North American green sturgeon designated critical habitat in the lower Yuba River (and therefore no substantial decreases in the quantity, quality, availability or distribution of critical habitat) would occur under the Proposed Action, relative to the Environmental Baseline.

9.2.3 Incidental Take Considerations

Under the Federal ESA, “take” is defined as “...to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct” [ESA§3(19)]. Harass, pursue, hunt, shoot, wound, kill, trap, capture or collect can be classified as actions that would have a direct effect on a species at the individual level. "Harass" is defined as an intentional or negligent act which creates the likelihood of injury to an individual by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering (NMFS 2016d). Harm, included in the definition of “take” is defined as “*an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering*” (64 FR 60727).

Although slight changes in the habitat availability and water temperature suitability may occur under the Proposed Action relative to the Environmental Baseline, these changes would not appreciably diminish the value of designated critical habitat. For the Proposed Action, there would be no “*significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering*” for the designated critical habitats of the listed species evaluated in this Applicant-Prepared Draft BA.

There would be potential incidental take of individuals of the spring-run Chinook salmon and steelhead populations associated with the Proposed Action through Narrows 2 operations, discussed here.

9.2.3.1 Narrows 2 Operations

Lower Yuba River flows during the winter and spring are often uncontrolled, and stranding of spring-run Chinook salmon and steelhead fry and isolation of juveniles can occur naturally during periods of uncontrolled runoff and spills, either through uncontrolled flow fluctuations or as runoff subsides and flows drop to controllable levels. Redd dewatering and juvenile salmonid stranding and isolation can occur during controllable flow conditions, particularly during emergency outage situations and associated coordination of operations between Narrows 1 and Narrows 2. Rapid flow fluctuations can, and have been observed, to result in the potential exposure of redds and in fry and juvenile salmonid stranding and isolation.

It is expected that under the Proposed Action, the potential for redd dewatering, and fry and juvenile stranding and isolation during controllable flow conditions will be reduced with implementation of YCWA's proposed conditions. Also, the proposed decrease in ramping rate, from 500 cfs per hour under the Environmental Baseline, to 200 cfs per hour under the Proposed Action, is anticipated to minimize potential effects to juvenile salmonids associated with stranding and isolation in the lower Yuba River.

There also have been observations of adult Chinook salmon apparently confined in an isolated pool in the channel near Narrows 2 Powerhouse. Although measures have been taken to physically restructure the potential isolation areas, and monitoring, reporting and fish rescue procedures have been developed, there still is the potential for temporary isolation of adults in pools near the Narrows 2 facilities in the future.

Although the Proposed Action would result in a decrease in the magnitude of redd dewatering, and fry and juvenile stranding and isolation, and is not anticipated to result in stranding of adult Chinook salmon, some potential for incidental "take" associated with Narrows 2 operations would remain under the Proposed Action.

9.3 Determinations

An effect determination, reflecting the impacts of the entire Proposed Action, is made for each species and each designated critical habitat. Determinations of these effects take into account both the magnitudes and probabilities of occurrence of effects to listed fish species and their designated critical habitats that would result from the Proposed Action.

9.3.1 Spring-run Chinook Salmon

9.3.1.1 Species Determination

Slight changes in stressors may occur under the Proposed Action relative to the Environmental Baseline, although these slight changes would not be of sufficient magnitude or frequency to

adversely affect spring-run Chinook salmon. In fact, implementation of YCWA's proposed conditions under the Proposed Action would be expected to reduce the potential for redd dewatering, and fry and juvenile stranding and isolation.

However, if incidental take is anticipated to occur as a result of the Proposed Action, USFWS and NMFS (1998) directs that an "*is likely to adversely affect*" determination must be made. Following this direction and considering the potential for incidental take of individuals associated with the Proposed Action, this Applicant-Prepared Draft BA concludes that the Proposed Action "*may affect, is likely to adversely affect*" spring-run Chinook salmon in the lower Yuba River.

9.3.1.2 Critical Habitat Determination

Although slight changes in spring-run Chinook salmon habitat availability and water temperature suitability may occur under the Proposed Action relative to the Environmental Baseline, all of the identified changes in these conditions are expected to be insignificant. This Applicant-Prepared Draft BA, therefore, concludes that the Proposed Action "*may affect, but is not likely to adversely affect*" spring-run Chinook salmon designated critical habitat in the lower Yuba River.

9.3.2 Steelhead

9.3.2.1 Species Determination

Slight changes in stressors may occur under the Proposed Action relative to the Environmental Baseline, although these slight changes would not be of sufficient magnitude or frequency to adversely affect steelhead. In fact, implementation of YCWA's proposed conditions under the Proposed Action would be expected to reduce the potential for redd dewatering, and fry and juvenile stranding and isolation.

However, if incidental take is anticipated to occur as a result of the Proposed Action, USFWS and NMFS (1998) directs that an "*is likely to adversely affect*" determination must be made. Following this direction and considering the potential for incidental take of individuals associated with the Proposed Action, this Applicant-Prepared Draft BA concludes that the Proposed Action "*may affect, is likely to adversely affect*" steelhead in the lower Yuba River.

9.3.2.2 Critical Habitat Determination

Although slight changes in steelhead habitat availability and water temperature suitability may occur under the Proposed Action relative to the Environmental Baseline, all of the identified changes in these conditions are expected to be insignificant. This Applicant-Prepared Draft BA, therefore, concludes that the Proposed Action "*may affect, but is not likely to adversely affect*" steelhead designated critical habitat in the lower Yuba River.

9.3.3 Green Sturgeon

Data limitations preclude application of the extinction risk criteria to green sturgeon in the lower Yuba River, and draw into question whether an attempt to do so is even warranted. Consequently, the evaluation of the effects of the Proposed Action on green sturgeon in this Applicant-Prepared Draft BA is restricted to determining whether or not potential habitat changes downstream of Daguerre Point Dam associated with the Proposed Action would have the potential to adversely affect green sturgeon designated critical habitat.

9.3.3.1 Critical Habitat Determination

Although slight changes in in flow-related habitat availability and suitability, and water temperature suitability, may occur under the Proposed Action relative to the Environmental Baseline, no substantial changes to designated critical habitat for North American green sturgeon in the lower Yuba River are expected to occur under the Proposed Action, relative to the Environmental Baseline. Because these changes in habitat conditions are expected to be insignificant, this Applicant-Prepared Draft BA concludes that the Proposed Action “*may affect, but is not likely to adversely affect*” North American green sturgeon designated critical habitat in the lower Yuba River.