United States Department of the Interior

FISH AND WILDLIFE SERVICE

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In Reply Refer To:
AFWO

Technical Memorandum

**TO:** Alan Heck (Area Manager), Bureau of Reclamation Klamath Basin Area Office

**FROM:** Tanya Sommer (Field Supervisor), Dr. Nicholas A. Som (Statistician) and William D. Pinnix (Supervisory Fish Biologist), Arcata Fish and Wildlife Office

**SUBJECT:** Response to Request for Technical Assistance

**DATE:** February 21, 2023

Under the authority of the Fish and Wildlife Coordination Act (16 USC §§ 661), the Bureau of Reclamation Klamath Basin Area Office (KBAO) requested the technical assistance of the U.S. Fish and Wildlife Service's Arcata Office (AFWO) on January 23, 2023, regarding aspects of their 2023 proposal for Klamath Project Operations. Primarily, Reclamation sought technical assistance on the following:

> "*... please collaborate with our tribal partners to accomplish the pre-action and post-action surveys requested in support of Reclamation's TOP efforts that were requested by e-mail on January 19th.*"

At KBAO's request, we coordinated with our Yurok and Karuk Tribal Partners to conduct a pre-action survey in the Klamath mainstem between Iron Gate Dam on the confluence with the Scott River. Reach 1 is from Iron Gate Dam to the confluence with the Shasta River; Reach 2 is from the Shasta River to the confluence with Beaver Creek; Reach 3 is from Beaver Creek to the confluence with the Scott River. A preliminary summary of the pre-action survey was previously provided to KBAO. The action to reduce mainstem discharge out of Iron Gate Dam commenced on February 14, 2023, and we again coordinated with Partners to complete a post-action redd survey. This technical memorandum serves as a preliminary summary of the post-action redd survey. A more formal and complete report will be provided at a later date.

During the initial survey that occurred January 24-26 (Figure 1), visibility was poor in all reaches especially just below the dam and in the lower 2/3rds of Reach 3, making it difficult to positively identify all redds present. Also of note, redds are only visible for approximately 2 weeks from construction, and so the redds identified during these surveys represent a very small portion of all redds constructed this season. Given the poor visibility and nature of redd detectability, these numbers should not be considered an estimate of redd abundance.

During the second survey (February 16-17) visibility was slightly better than the initial survey, but still limited, and counts should not be considered an estimate of redd abundance.

**Summary of results.**

Reach 1: A relatively small number (4) of redds were observed in Reach 1 during the pre-action survey, with an additional 3 redds observed during the post-action survey. None of the redds in Reach 1 were considered at risk of dewatering in either survey.

Reach 2: A total of 51 redds were observed during the pre-action survey (Figure 2). Based on relative flow reductions being discussed prior to the pre-action survey (21% reduction), the survey crews estimated risk of dewatering for water depths less than 0.5 meters, and 31 redds met this criterion. During the post-action survey, none of those 31 redds were found dewatered, however 4 of those 31 redds were found to have depths less than an inch of water. These shallow depths suggest dewatering is likely with an additional drop in stage. In addition, the remaining 27 redds initially identified as at risk at during the pre-action survey were found in water depths of roughly 0.15 m (6 inches) during the post-action survey, and would be at risk of dewatering with a stage drop of 0.15 m or more. In the area of dense redds encountered by survey crews during the pre-action survey, crews estimated an approximately 6 inch drop in stage with the 11% discharge reduction.

Reach 3: A single redd (1) was observed during the post-action survey. Visibility in Reach 3 was too poor to reliably identify redds during the initial survey and marginal during the second survey; the lack of observed redds during the initial survey should not be interpreted as no redds. The single redd identified during the second survey was not at risk of dewatering.

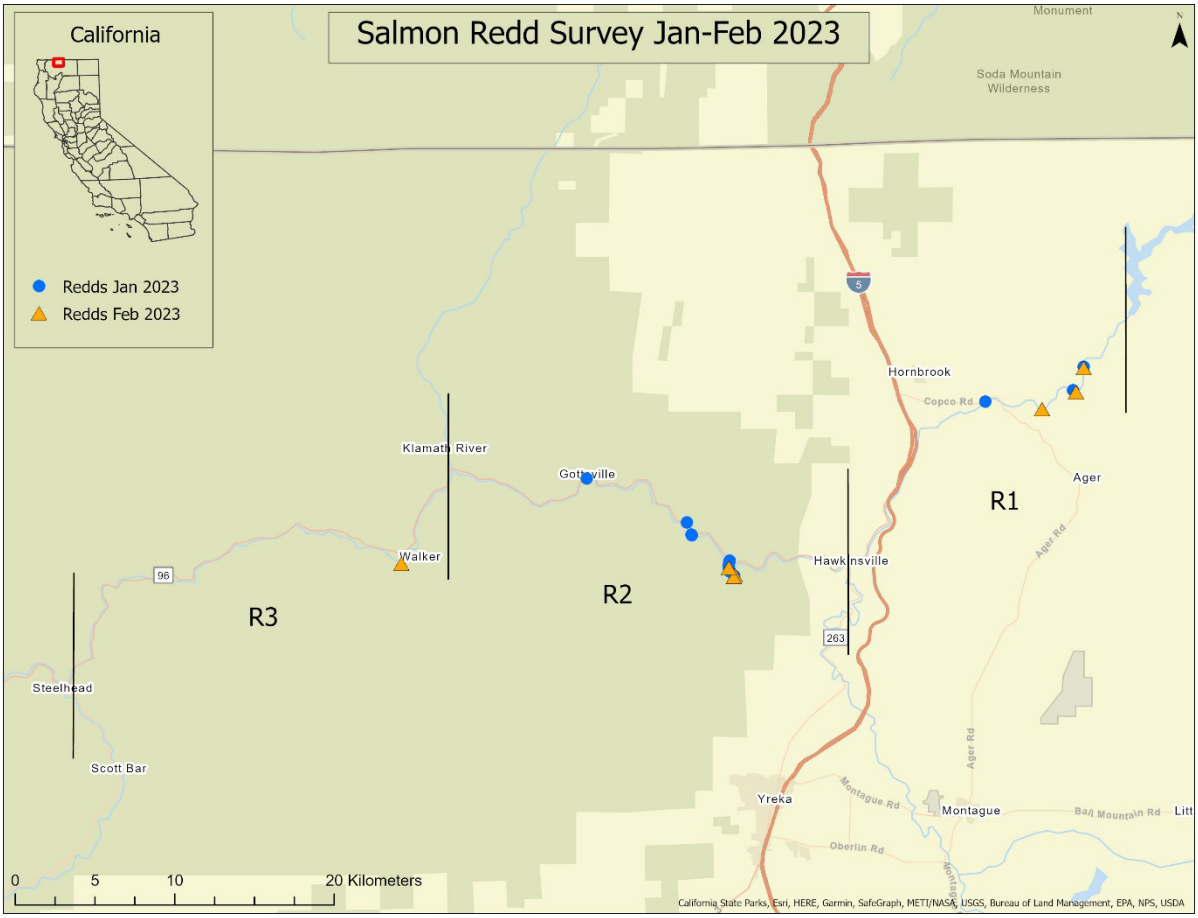


Figure 1. Location of salmon redds on the mainstem Klamath River, surveyed January-February 2023 from Iron Gate Dam to the confluence with the Scott River, California. Individual points may represent more than one redd. Survey reaches are indicated by vertical bars and labeled R1-R3 (Reach 1 – Reach 3). Redds identified during the February survey are additional redds observed after the January survey.

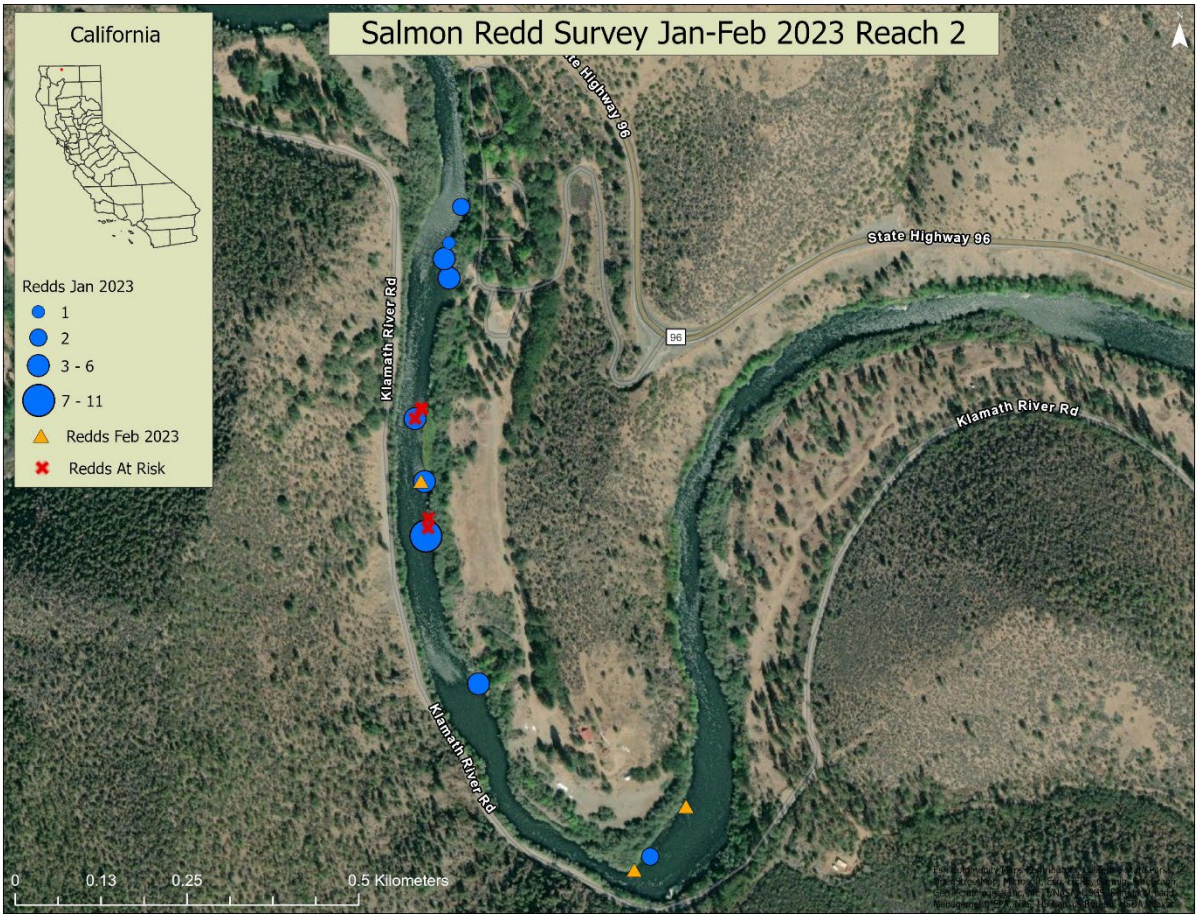


Figure 2. Location of salmon redds on the mainstem Klamath River, California surveyed January-February 2023 in Reach 2, zoomed into the Tree of Heaven area. Individual points may represent more than one redd (see legend). Redds identified during the February survey are additional redds observed after the January survey. Redds at risk are those observed during the February survey that were in water less than 0.15 m depth.