

## ***Hydropower Project Summary***

### ***SULTAN RIVER, WA***

HENRY M JACKSON HYDROELECTRIC PROJECT (P-2157)

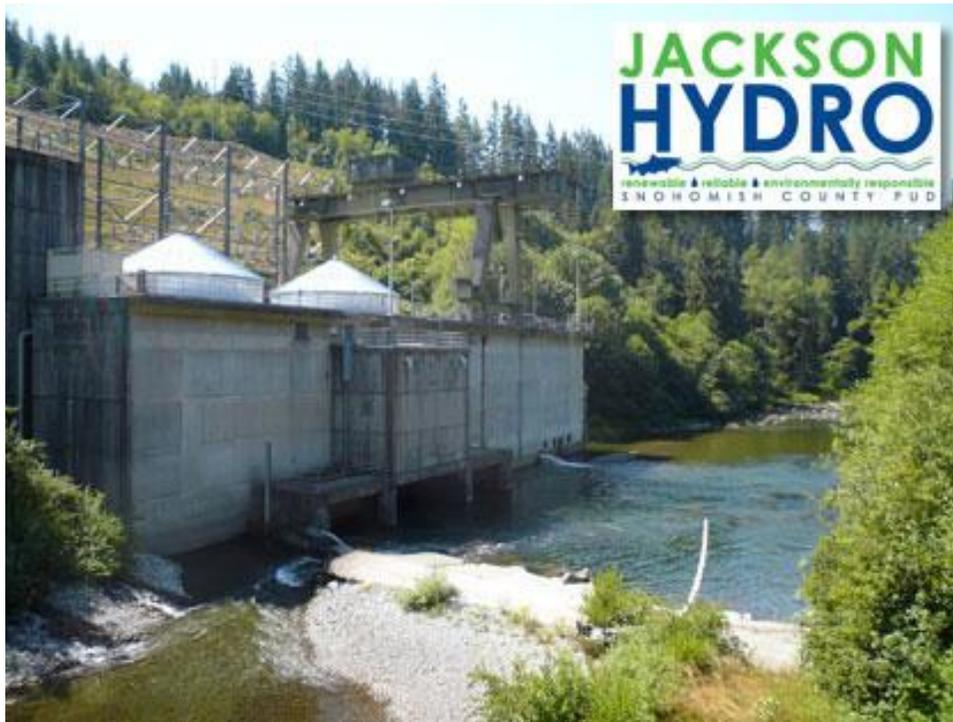


Photo Credit: Snohomish County Public Utility District

*This summary was produced by the*

**Hydropower Reform Coalition**

*and*

**River Management Society**

## **SULTAN RIVER, WA**

### HENRY M JACKSON HYDROELECTRIC PROJECT (P-2157)

***DESCRIPTION:***

The Jackson Project is located on the Sultan River in northwestern Washington. The project's authorized capacity is 111.8 megawatts (MW). The project is located on the Sultan River, 20 miles east of the City of Everett, Washington, in Snohomish County. The project occupies 10.9 acres of the Mount Baker-Snoqualmie National Forest administered by the U.S. Forest Service (Forest Service). Downstream of the project's Culmback dam at Spada Lake, the Sultan River flows through a deep forested gorge for nearly 14 miles. The project powerhouse is located near the downstream end of the gorge.

The District (Public Utility District No. 1 of Snohomish County) currently operates the project to satisfy the City of Everett's municipal water supply needs, protect aquatic resources, maintain Spada lake levels for summer recreation, and generate electricity. The new license requires additional measures to protect and enhance water quality, fish, wildlife, recreation, and cultural resources.

The twelve signatories to the Settlement Agreement are the District, National Marine Fisheries Service (NMFS), Forest Service; U.S. Fish and Wildlife Service (FWS), U.S. National Park Service, Washington Department of Fish and Wildlife (Washington DFW), Washington Department of Ecology (Ecology), Tulalip Tribes of Washington (Tulalip Tribes), Snohomish County, Washington; City of Everett; City of Sultan; and American Whitewater.

#### **A. SUMMARY**

1. License application filed: June 1, 2009
2. License Issued: September 2, 2011
3. License expiration: September 30, 2056
4. Waterway: Sultan River (North and South Forks) and Williamson Creek
5. Capacity: 118.8 MW
6. Licensee: Public Utility District No. 1 of Snohomish County
7. Licensee address: Snohomish County PUD  
PO Box 1107  
2320 California Street  
Everett, WA 98201
8. County: Snohomish

9. Project area: The headwaters of the Sultan River are located within the Washington Department of Natural Resources' (Washington DNR) Morning Star Natural Resources Conservation Area and the Mount Baker-Snoqualmie National Forest. The South Fork Sultan River, North Fork Sultan River, and Williamson Creek flow into Spada Lake, the reservoir impounded by the project's Culmback dam. Downstream of Culmback dam, the Sultan River flows through a deep forested gorge for nearly 14 miles. The river channel in this reach is relatively high gradient and confined within steep rock walls. The project powerhouse is located near the downstream end of the gorge where the Sultan River emerges onto a broad, relatively flat valley floor. The city of Sultan is located at the mouth of the Sultan River where it joins the Skykomish River about 3 miles downstream of the end of the gorge. The city of Sultan business district is located within the floodplain of both rivers.
10. Project Facilities (See **Figure 1**) include:
- a. Hydro-generation and stream-water flow facilities
    - Culmback dam, located at river mile 16.5, creates Spada Lake, an approximately 1,908-acre reservoir. The base of the dam is equipped with outlet works that provide a 20-cubic-foot-per-second (cfs) minimum instream flow release below Culmback dam. Water flows from a 110-foot-tall intake structure in the reservoir into a 7.5 mile tunnel structure that leads to the Jackson powerhouse.
    - The Jackson Project powerhouse contains four turbine-generating units with a total installed capacity of 111.8 MW. Units 1 and 2 are Pelton turbines rated at 47.5 MW each, and units 3 and 4 are Francis turbines rated at 8.4 MW each. Flows that are required to meet either the city of Everett's water demands or instream flow requirements pass through the Francis turbines. These flows then enter the non-project Lake Chaplain 3.5 mile pipeline and are propelled up-gradient by the head differential between Spada Lake and City of Everett's non-project Lake Chaplain municipal water storage reservoir. A control structure located at the terminus of the pipeline on the shore of Lake Chaplain delivers flows needed for the city of Everett's consumptive water supply in to Lake Chaplain and delivers flows needed to meet minimum instream flow requirements below the Sultan River diversion dam back to the river, through the 1.5-mile long Sultan River diversion dam tunnel and a 2,000-foot-long pipeline.
    - The Sultan River diversion dam is located in the Sultan River 9.7 miles upstream from its confluence with the Skykomish (RM 9.7) in the Sultan River bypassed reach. Historically, the Sultan River diversion dam functioned exclusively to provide water to the Lake Chaplain municipal water storage reservoir. Under existing operations the Sultan River diversion dam only occasionally diverts water from the intake on the Sultan River through the Sultan River diversion dam tunnel and

pipeline to Lake Chaplain as back-up municipal water supply when the Jackson Project powerhouse is not operating. The Sultan River diversion dam pipeline and tunnel are also used to return flows to the Sultan River to meet minimum instream flow requirements below the diversion dam. Thus, flows can travel from the dam to the lake or from the lake to the dam, depending on water supply and minimum flow requirements.

- Flows that are not required for water supply or minimum instream flow are passed through the Pelton turbines and discharged directly to the Sultan River through the powerhouse tailrace. Flows through the powerhouse bypass a 12-mile long reach of the Sultan River.
- A switchyard adjacent to the powerhouse delivers power to the District's existing transmission system.

b. Recreation facilities

- The District currently operates and maintains six day-use recreation sites at Spada Lake. Of the six recreation sites, only the portions of the South Fork Recreation Site, South Shore Recreation Site, and Nighthawk Recreation Site below elevation 1,460 feet are located within the project boundary; the remaining recreation sites, Bear Creek, North Shore, and Olney Pass, are located outside of the project boundary
- The District and the City of Everett also cooperatively developed six river access areas along the Sultan River, downstream from the Sultan River diversion dam; all are currently located outside the project boundary. These access areas, from upstream to downstream, are: (1) Sultan River Diversion Dam River Access Area; (2) Horseshoe Bend River Access Area; (3) Old Gaging Station Road River Access Area; (4) Powerhouse West River Access Area; (5) Powerhouse East River Access Area; and (6) Trout Farm Road River Access Area.

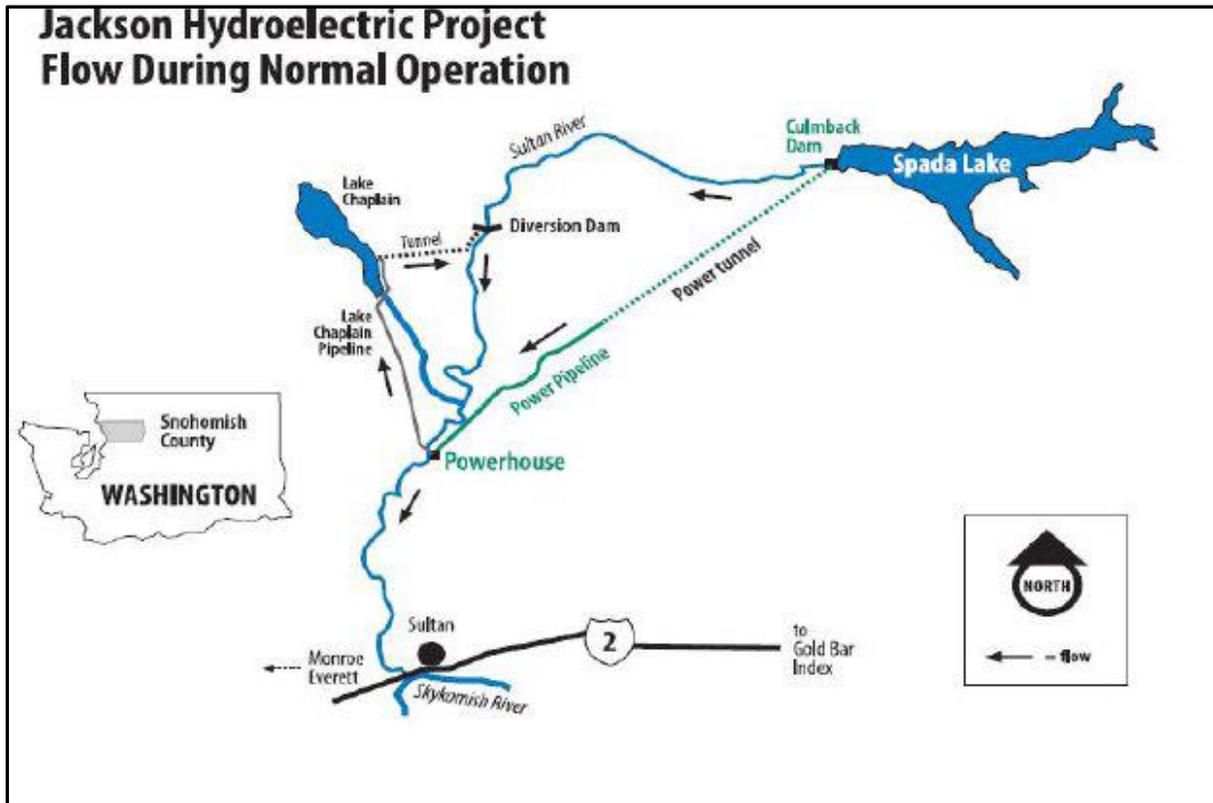


FIGURE 1

**B. IMPORTANT PROVISIONS AND REQUIREMENTS IN LICENSE**

The license provides for measures to protect and enhance water quality, fish, wildlife, recreation, and cultural resources at the project. This license considers municipal water supply needs, and requires staff's recommended measures to improve the administration and compliance of the license. It includes license articles (LA) pertaining to aquatic and water quality measures, including developing and/or implementing new plans in addition to those submitted prior to license approval. (See **Tables 1 and 2**).

The license also requires the establishment of an Aquatic Resources Committee composed of members from the District, NMFS, Forest Service, FWS, Washington DFW, Washington Ecology, Tulalip Tribes, Snohomish County, City of Everett, City of Sultan, and American Whitewater. The purpose of the committee is to provide input and advise the District on how to maintain healthy fisheries and habitat.

**Table 1: Aquatic License Articles (A-LA)**

<b>Article</b>	<b>Enhancement</b>	<b>Required Actions</b>	<b>Additional License References</b>
A-LA 1	Aquatic Resources Committee	Establish Committee	Appendices B, G
A-LA 2	Marsh Creek Slide Monitoring and Modification	Develop and implement Marsh Creek Slide Monitoring and Modification Plan	Article 402; Appendices A, G
A-LA 3	Temperature Conditioning in Reach 3	Develop and implement Water Temperature Conditioning Plan	Article 415; Appendices A, B, G
A-LA 4	Whitewater Boating Flows	Implement Whitewater Recreation Plan*	Article 412; Appendices A, B, G
A-LA 5	Downramping Rate Conditions	Implement specified flow rates	Article 403; Appendices A, G
A-LA 6	Large Woody Debris	Develop and implement Large Woody Plan	Appendices A, B, G
A-LA 7	Side Channel	Develop and implement Side Channel Enhancement and Ramping Rate Evaluation Plans	Article 404; Appendices A, G  Article 405
A-LA 8	Process Flow Regime	Implement Process Flow Plan	Article 416; Appendices A, B, G
A-LA 9	Minimum Flows	Implement enhanced specified minimum instream flow schedules	Appendices A, B, G
A-LA 10	Spada Lake Recreational Fishery Plan	Develop and implement Spada Lake Recreational Fishery Plan	Article 411; Appendix G
A-LA 12	Fish Habitat Enhancement Plan	Develop and implement Fish Habitat Enhancement Plan	Appendices A, B, G
A-LA 13	Diversion Dam Volitional Passage	Provide for upstream and downstream fish passage per criteria	Appendices A, C, D, G
A-LA 14	Reservoir Operations	Operate Spada Lake per reservoir rules curve criteria	Article 406; Appendices A, G
A-LA 15	Adaptive Management	Develop and implement Adaptive Management Plan in combination with A-LA 14.	Appendices A, B, G
A-LA 17	Fisheries and Habitat Monitoring Plan	Develop and implement Fisheries and Habitat Monitoring Plan	Article 410; Appendices A, B, G

\* Plans submitted prior to license approval and included during review process.

**Table 2: Conservation (C-LA), Recreation (R-LA), Terrestrial (T-LA), and Water Quality (W-LA) License Articles**

<b>Article</b>	<b>Enhancement</b>	<b>Required Actions</b>	<b>Additional License References</b>
C-LA 1	Historic Properties Management Plan	Implement Historic Properties Management Plan*	Article 414; Appendices B, G
R-LA 1	Recreation Resources Management Plan	Implement Recreation Resources Management Plan*	Article 413; Appendices B, G
T-LA 1	Terrestrial Resources Management Plan	Implement Terrestrial Resources Management Plan**	Appendices B, G
T-LA 2	Noxious Weed Plan	Implement Noxious Weed Plan*	Appendices B, G
T-LA 3	Marbeled Murrelet Habitat Protection Plan	Implement Marbeled Murrelet Habitat Protection Plan*	Article 411; Appendices B, G
W-LA 1	Water Quality Protection Plan	Develop and implement Water Quality Protection Plan	Appendices B, G

\* Plans submitted prior to license approval and included during review process

The extensive new measures can be categorized as follows:

- Aquatic Resource Measures;
- Terrestrial Resource Measures;
- Recreation Measures; and
- Cultural Resource Measures.

**1. Aquatic Resource Measures**

To protect fish and aquatic resources in the Sultan River and Spada Lake, the license requires the District to:

- a. Improve water temperature conditions in the bypassed reach downstream of Culmback dam to benefit salmonids;
- b. Modify the Marsh Creek rockslide to improve upstream fish passage in the project bypassed reach;
- c. Construct fishways at the Sultan River diversion dam to provide access to an additional 6.4 miles of aquatic habitat;
- d. If the fish “passage trigger” [Reference: Appendix D (page 107 of the license)] is met, provide a combination of higher minimum flows and channel forming, channel maintenance, and flushing flows to enhance aquatic habitat in the Sultan River from Culmback dam to its confluence with the Skykomish River;

- e. Institute a spawning flow-ceiling of 550 cfs in the lower Sultan River during the September 15 to October 15 period of peak spawning for Chinook salmon;
- f. Provide flow continuation at the project's Pelton turbines and implement ramping rates to reduce the potential for fish stranding;
- g. Implement side-channel and large woody debris enhancement projects that will increase connectivity with the mainstem and increase structure in the mainstem and side channels to enhance salmonid spawning and rearing habitat in the lower 3 miles of the Sultan River;
- h. Conduct a fisheries and habitat monitoring program to guide implementation of enhancement measures;
- i. Monitor and protect water quality throughout the project area; and,
- j. Enhance the recreational fishery in Spada Lake.

Specific enhancements for recreational fishery includes improving the South Fork Recreation Site boat launch [Reference: License Article 409 (page 66 of the license and 413 (page 69 of the license)] and preparing a recreational fishing brochure for Spada Lake [Reference: License Article 409]. The license also requires the District to establish a fund with a deposit of \$2.5 million to implement future habitat enhancement.

Starting the tenth anniversary (Sept. 2, 2021) after issuance of the license and annually for the term of the license, the District is required to deposit \$200,000 into the account.

Additionally, to improve Commission administration and oversight of the license, this license also requires the District to:

- a. Maintain specific reservoir levels during State 3, subject to other environmental requirements of the license, in order to enhance recreational use of Spada Lake (see **3 Recreation Measures** of this summary);
- b. Develop an Operation Plan to define management and operational procedures that will be followed to meet targeted lake levels;
- c. Develop and implement an Operational Compliance Monitoring Plan; and,
- d. File reports detailing implementation and completion of salmon spawning protective measures, side channel enhancements, and Marsh Creek slide modifications.

The requirement to develop and implement an Adaptive Management Plan [Reference: A-LA 15 (page G-35 of the license) with A-LA 14 (page G-33 of the license)] is designed to address balancing power generation with recreation and other environmental benefits in addition to the competing demands on available water that make project operations complex when considering drought conditions and changing municipal water supply. The Adaptive Management Plan will document how the District will address water use issues and the process for evaluating and adaptively managing competing water uses within the constraints of the specific environmental measures.

## **2. Terrestrial Resource Measures**

To protect and enhance terrestrial resources, this license requires the District to:

- a. Implement its Terrestrial Resources Management Plan, which emphasizes preserving and enhancing old-growth and late-succession habitats (habitat important to the recovery of the federally listed northern spotted owl and marbled murrelet);
- b. Implement its Noxious Weed Management Plan;
- c. Implement its Marbled Murrelet Habitat Protection Plan, which will further protect occupied marbled murrelet habitat during activities implemented under this license (e.g., trail construction, habitat management activities, etc.); and,
- d. Bring the 4,456 acres of District-owned lands managed under the plan into the project boundary.

## **3. Recreation Measures**

To improve recreation opportunities at the project, the license requires the District to:

- a. Implement its Recreation Resource Management Plan with additional reporting requirements that will provide for:
  - i. continued operation and maintenance of existing recreation sites,
  - ii. enhancement of these sites, and
  - iii. the addition of a new recreation site and access trails to the Sultan River below Culmback dam.
- b. Implement its Whitewater Recreation Plan (filed June 17, 2010) with additional reporting requirements that will:
  - i. provide up to 12 viable whitewater releases during each 3-year period of the license, and
  - ii. provide for evaluation of the releases and environmental issues that may be associated with whitewater events.
- c. Implement its Spada Lake Recreational Fishery Plan with the requirement that the District maintains proposed summer Spada Lake levels rather than “attempt to” maintain proposed summer lake levels.

The Recreation Resources Management Plan provides for the District’s continued operation and maintenance of the existing six day use recreation sites at Spada Lake and the development of a new recreation site on Spada Lake near the junction of Culmback

Dam Road and Forest Road 6122. The District will also enhance recreation on Spada Lake by: a) improving the existing boat ramp to accommodate trailered-boat launching and expanding parking for trailered-boats at the South Fork Recreation site; b) adding picnic tables and signage at the South Shore Recreation Site; c) constructing new guardrails and adding picnic tables, benches, and signage to the Bear Creek Recreation Site; and d) replacing aging signage and railings at the North Shore Recreation Site.

The District will improve access to the Sultan River by: a) developing a new trail from Culmback dam to the dam's base; b) developing a new Sultan River Canyon trail from Forest Road 6122 to the upper portion of the Sultan River bypassed reach; c) modifying the gate to allow pedestrian-only, year-round river access at the Powerhouse East River Access Area; and d) better defining and expanding trailer-boat parking by removing boulders that inhibit boat launching, reconfiguring the driveway and boat launch entrance, and improving signage at the Trout Farm Road River Access Area.

Whitewater boaters use multiple segments of the Sultan River. The upper whitewater boating reach extends from Culmback dam downstream to the Jackson Project powerhouse and offers whitewater flows rated at Class III (intermediate) and Class IV (advanced). The downstream boating reach begins at the powerhouse and continues to the confluence with the Skykomish River and offers whitewater flows rated at Class I (easy) and Class II (novice).

For whitewater releases, viable events may be either scheduled or unscheduled. A viable scheduled event is a minimum of two events each year that are scheduled at least two weeks in advance and occur on weekends, with one occurring in September and one in April or May at flows between 600 and 2,000 cfs and occur at least 3 hours. A viable unscheduled event is defined as a calendar day: (a) occurring between March 15 and November 30 or at times agreed to between the District and American Whitewater after consultation with the Aquatic Resource Committee; (b) with controlled and uncontrolled releases (i.e., spill) and accretion flows between 600 and 2,000 cfs for at least three hours; (c) during a time of day that supports whitewater boating and at conditions that allow access to the river reach; and (d) with at least 48 hours notice to boaters.

The revised curves for reservoir levels in the license modify State 3 elevation targets between July 1 and September 15. To benefit the recreational fishery and recreation use on Spada Lake, the District would maintain (no longer attempt to maintain) a minimum water surface elevation in Spada Lake above 1,430 feet between July 1 and August 15. Until the temperature conditioning structure is installed and operational [Reference: A-LA 3 (page G2 of the license)], the District would maintain a minimum elevation in Spada Lake at or above 1,420 feet from August 16 through September 15. After the temperature conditioning structure is installed, the District would maintain a minimum Spada Lake elevation above 1,415 feet from August 16 to September 15.

#### **4. Cultural Resource Measures**

To protect and enhance cultural resources, the license requires the District to: implement its HPMP which will ensure that any adverse effects on historic properties as a result of project operation, maintenance, recreational, or other activities are addressed over the term of the new license and ensure protection of cultural resources within the project boundary.

#### **C. MAP**

There are two convenient ways to become familiar with this project on the Hydropower Reform Coalition website, [www.hydroreform.org](http://www.hydroreform.org).

- Go directly to the project page <http://www.hydroreform.org/projects/henry-m-jackson-sultan-p-2157>
- To understand the geographical context of the project, visit the *On Your River* section of the site. This link (<http://www.hydroreform.org/on-your-river/Northwest>) will take you to the section for rivers in the Northwest. Zoom in until you can see Seattle. Mouse over the marker east (and slightly north) of Everett for P- 2157.

#### **D. UPDATE**

**Post-license Activities** - Snohomish County PUD maintains a project website for Henry M. Jackson Hydropower Project. It includes historic FERC filing documents and fairly current information on their Fish, Terrestrial, and Recreation Programs (last updated in 2018). The Recreation Resources Management Plan and 2019 Annual Report and Work Plan is also included. The Whitewater Recreation Plan is dated (2012). According to Snohomish PUD's Hydropower contact, Dawn Presler, they have developed all required management plans and constructed all required PM&Es that were identified to date.

<https://www.snopud.com/?p=1196>

Updated February, 2020