Calligan Creek Hydroelectric Project
FERC No. 13948

AMPHIBIAN AND REPTILE
PRE-CONSTRUCTION SURVEYS AND
PRIORITY SPECIES EVALUATION

ADDENDUM

Prepared for:
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AMPHIBIAN AND REPTILE PRE-CONSTRUCTION SURVEYS AND PRIORITY SPECIES EVALUATION - ADDENDUM

1.0 METHODS

Surveys of Wetland C10 were performed on April 14 and July 2, 2014. Each survey included a visual search of areas with standing and slow-moving water in the south part of Wetland C10, including deep channels and a shallow, seasonally inundated area where most observations of amphibians occurred in 2013 (Figure 1).

![Figure 1. Wetland C10.](image_url)
The two final surveys were intended to confirm absence of Oregon spotted frog (*Rana pretiosa*) according to the survey protocols. Survey methods followed the visual encounter procedures described by Pearl et al. (2010), except that a single observer rather than a 2-3 person team was employed because of the relatively small area to be searched. Pearl et al. (2010) recommends the second-year effort include a survey during the Oregon spotted frog breeding season and a survey during summer conditions when adult and juvenile Oregon spotted frog are most readily detected. During the April 14 survey, amphibian egg masses were also sought and dip-netting for larvae was employed during the July 2 survey. Survey results at Wetland C10 were compared to the contemporaneous results of surveys for Oregon spotted frog at a site in Whatcom County, Washington by the lead investigator, including the timing of breeding activity, hatching, larval dispersal, growth and development, and detection of adults and juveniles. Photographs illustrating life stages of Oregon spotted frog can be found at: http://calphotos.berkeley.edu/fauna/com-Amphibian.html.

2.0 RESULTS

Three species of amphibians were documented by the surveys on both dates: northwestern salamander (*Ambystoma gracile*), Pacific chorus frog (*Pseudacris regilla*), and northern red-legged frog (*Rana aurora*). Two species observed at the site in 2013, rough-skinned newt (*Taricha granulosa*) and western toad (*Anaxyrus boreas*), were not observed. Similar to the results in 2013, water temperatures in Wetland C10 were relatively low in the deep, persistent channels, with warmer water only in a shallow, seasonally inundated area.

On April 14, six mostly hatched northern red-legged frog egg masses were found in the shallow, seasonally inundated area noted above (Table 1). These egg masses exhibited the typical loose, “frothy” appearance of northern red-legged frog egg masses after hatching (see Figures A-2 and A-3 of Appendix A). Compared to Oregon spotted frog egg masses at the same stage, the observed egg masses were not located in an aggregation, each was larger in diameter, the egg envelopes less persistent, and hatchlings were not still associated with the egg mass. One northwestern salamander egg mass and six Pacific chorus frog egg masses, including five that appeared to have been freshly laid, were also observed. On the same date, Oregon spotted frog egg masses monitored in Whatcom County had hatched and larvae were aggregated at communal egg mass locations.

Table 1. Results of surveys for lentic-breeding amphibians at wetland C10 in 2014.

<table>
<thead>
<tr>
<th>Date</th>
<th>Type/Effort</th>
<th>Air Temp. (°C)</th>
<th>Water Temp. (°C)</th>
<th>Northwestern Salamander</th>
<th>Pacific Chorus Frog</th>
<th>Northern Red-Legged Frog</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/14</td>
<td>V / 3.01</td>
<td>17</td>
<td>7.5/11.5</td>
<td>EM (1)</td>
<td>EM (6)</td>
<td>EM (6), L (many)</td>
</tr>
<tr>
<td>07/02</td>
<td>V / 3.251</td>
<td>25-27</td>
<td>16/19.52</td>
<td>EM (2)</td>
<td>L (8)</td>
<td></td>
</tr>
</tbody>
</table>

Type: V = visual survey. D = dip-netting. EM = egg mass. L = larvae
1 Effort: For visual survey, effort is total person hours. For dip-netting, effort is number of sweeps.
2 First temperature from main channels; second temperature from shallow emergent area where northern red-legged frog egg masses and larvae were found.
The results of the July 2 survey included northern red-legged frog larvae found by dip-netting in the shallow emergent area where egg masses had been observed earlier (Table 1). These larvae were clearly identifiable as northern red-legged frog based on coloration and morphology. The only other amphibians found were two Pacific chorus frog egg masses about to hatch and recently hatched larvae of this species. On the same date, Oregon spotted frog larvae monitored in Whatcom County were mostly in pre-metamorphic stages with small hind limbs and were easily observed. Combined with the results of surveys at Wetland C10 in 2013, that did not detect Oregon spotted frog, the surveys in 2014 demonstrate that Oregon spotted frog does not occur at the site.

3.0 REFERENCES

Appendix A – Field Photographs

Figure A-1. This is the shallow emergent wetland area where most of the amphibian observations occurred in Wetland C10 2013 and all occurred in 2014. (April 14, 2014)

Figure A-2. A total of 6 mostly hatched northern red-legged frog egg masses were found in the shallow emergent area. A single egg mass is shown here (center of photo). (April 14, 2014)
Figure A-3. This is another northern red-legged frog egg mass found during the survey (center of photo, surrounded by algae). (April 14, 2014)

Figure A-4. One northwestern salamander egg mass was also found. (April 14, 2014)
Figure A-5. No amphibians were observed in the deep channels, such as the one shown here. (July 2, 2014)

Figure A-6. Northern red-legged frog larvae were found in this small area of shallow water. (July 2, 2014)
Figure A-7. All of the 8 northern red-legged frog larvae found during the survey were clearly identifiable as this species. (July 2, 2014)