

### **Information Request 21**

Information Request 21

21-1

### **Responses to Information Request 21**

Response to Information Request 21a and b

21-2

## **IR 21 – Little Fish Lake**

### **References:**

EIS Guidelines, Section 2.7.2.5  
EIS, Section 1.2.3, 2.6.1.5, and 2.7.3.2  
EIS Appendix 2.7.2.5-A (Fish and Fish Habitat Compensation Plan)

### **Related Comments:**

CEAR # 277 (Fisheries and Oceans Canada)

### **Rationale:**

Section 2.7.2.5 (p. 48) of the EIS Guidelines requires the Proponent to include an analysis on the productive capacity of aquatic resources and an assessment of all water bodies that may experience changes to Aboriginal, commercial and/or recreational fisheries resources.

In the EIS (p.10) the Proponent states that Little Fish Lake does not contain a biologically distinct body of fish, as it is not capable of sustaining fish throughout the winter, and instead fish move between that area and other habitat.

Section 2.6.1.5 illustrates that Little Fish Lake has 6.6 ha fish habitat, all of which is less than 6 m in depth (littoral habitat; maximum depth of 4.4 m). As a result, Little Fish Lake would potentially be subject to periodic winter kill. However, as an adult Rainbow Trout was captured in the lake, absolute winter kills (i.e. 100% mortality) are likely infrequent.

Fisheries and Oceans Canada (DFO) noted that the Fish Habitat Compensation Plan (Appendix 2.7.2.5-A, p. 1), states: “since Little Fish Lake does not support documented fishing effort, the Project will also not affect fishing opportunities in the watershed.” However the Panel notes that at the 2009 panel hearings, evidence of fishing in Little Fish Lake was presented.

### **Information Requested:**

The Panel requests that Taseko:

- a. Clarify the fisheries values and fish habitat in Little Fish Lake.
- b. Assess the overall effects to the local fisheries resources and associated tributaries resulting from the loss of Little Fish Lake.

**Information Requests #21a and b**

- a. Clarify the fisheries values and the fish habitat in Little Fish Lake.
- b. Assess the overall effects to the local fisheries resources and associated tributaries resulting from the loss of Little Fish Lake

Responses to both information requests are combined below.

**Response Summary**

Based on the following biophysical characteristics of Little Fish Lake, it remains unlikely that a resident Rainbow Trout population is, or would be, sustainable on a perennial basis:

- shallow depth of Little Fish Lake (4.4 m maximum) and increased likelihood of substantial substrate-to-surface freeze-up in winter (predicted);
- recorded frozen inlet and outlet tributaries in winter (Triton 2012) and nil outlet flows in late summer (Triton 2011);
- late summer water temperatures (19.4°C) that approach the maximum tolerable limit of that preferred by Rainbow Trout (14 - 20°C; 22°C maximum); and
- low catch per unit gill net effort (one Rainbow Trout captured in one gill net set in 1997).

Based on the absence of recreational fishing effort in Little Fish Lake, (incidental observations) during multiple years of aerial overflights of lakes in the Chilcotin area (M. King, pers. comm. 2012; Pilot, White Saddle Air Services) conducted on behalf of the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) and sparse accounts from Tsilhqot' in First Nation members (Little Fish Lake was primarily used for hunting, trapping, and cattle grazing), it remains unlikely that Little Fish Lake supported/supports a sustainable, perennial fisheries of any type. Because there is no fishery value associated with Little Fish Lake, there will be no effect on the local fishery resources resulting from the loss of Little Fish Lake.

**Discussion****Little Fish Lake Rainbow Trout Habitat**

Little Fish Lake has a surface area of 6.6 ha, maximum depth of 4.4 m and therefore comprises littoral habitat only (< 6.0 m depth). Pelagic habitat (> 6.0 m) capable of supporting overwintering fish is absent.

In general, Rainbow Trout prefer water temperature between 14°C and 20°C (Table 21-1). Based on the depth and water clarity (4 m secchi depth; Triton 1999b) of Little Fish Lake (shallower and more turbid) compared to Fish Lake (deep and clear), and the documented temperatures of

Fish Lake in 1997 (ranging from 9.5 to 19.4°C over the study period) it is suspected that the temperature in Little Fish Lake may rise above the preferred temperature range in the summer months. Further, due to the absence of flow in the outlet tributary (Reach 8) during late summer (dry) and winter (frozen; Triton 2011; Triton 2012), and the likelihood for substantial freezing in winter (substrate-to-surface) due to its shallow depth, it is unlikely that Little Fish Lake would support a sustainable Rainbow Trout population in winter (i.e., subject to winter-kill). Therefore, the data suggests that Little Fish Lake may provide non-ideal habitat only for Rainbow Trout in terms of water temperature, ephemeral nature of inflow and outflow tributaries, and the concomitant lack of perennial migratory habitat (i.e., absence of outmigration routes to sustainable habitats).

**Table 21-1. General habitat requirements for Rainbow Trout (from Kerr and Lasenby, 2000)**

Parameter	Requirement
Size of waterbody	<ul style="list-style-type: none"> <li>• Minimum of ¼ acre for ponds</li> <li>• Lakes less than 100 ha</li> <li>• Streams and small rivers</li> </ul>
Water depth	<ul style="list-style-type: none"> <li>• Moderately deep – deep (e.g., &gt; 10-12 m) water in lakes.</li> <li>• Mean depth of 2-3 m with some areas at least 4-5 m feet deep in ponds.</li> <li>• Presence of deep pools in streams for overwinter habitat.</li> </ul>
Bathymetry	<ul style="list-style-type: none"> <li>• Shoreline/littoral zone should slope deeply into 1-1.2 m of water in ponds.</li> </ul>
Water clarity	<ul style="list-style-type: none"> <li>• Clear (Secchi 4-8 m on average)</li> </ul>
Water temperature	<ul style="list-style-type: none"> <li>• 14-20° C preferred; maximum 22° C</li> </ul>
pH	<ul style="list-style-type: none"> <li>• Minimum of 6.5; optimal range 6.5-8.0</li> </ul>
Dissolved oxygen	<ul style="list-style-type: none"> <li>• Minimum of 5 mg L<sup>-1</sup></li> </ul>
Water velocity	<ul style="list-style-type: none"> <li>• Maximum of 22-23 cm sec<sup>-1</sup> (less for juvenile life stages)</li> </ul>
Trophic status of waterbody	<ul style="list-style-type: none"> <li>• Morphedaphic index (MEI) usually in range of 8-10.</li> </ul>

#### Little Fish Lake Rainbow Trout Population

The Rainbow Trout population in Little Fish Lake was very roughly estimated at 5,000 individuals based on the capture of a single Rainbow Trout in the 1990's (Triton 1999b) indicating fish presence, and then applying that density (766 fish/ha) of Rainbow Trout in Fish Lake to the area (6.6 ha) of Little Fish Lake. Given the extremely high (surrogate) density of Rainbow Trout in Fish Lake and the probability of periodic, if not regular winter kills, and lack of migratory/recruitment habitat to/from Little Fish Lake throughout most of the year, the population estimate of 5,000 Rainbow Trout in Little Fish Lake is likely high.

### Little Fish Lake Rainbow Trout Recreational Fisheries Values

As described in the previous (2009) EIS submission, Fish Lake does support recreational and Aboriginal fisheries (Section 2.6; page 305). Little Fish Lake, however, does not have any documented records of recreational fishing use and limited accounts of Aboriginal fishing use. The Little Fish Lake area is used by Tsilhqot'in First Nation members primarily for hunting, trapping, plant collection and spiritual purposes (see **Little Fish Lake Aboriginal Fisheries Values** below).

Data for the Fish Lake recreational fishery during a five year period in the 1990's is shown in Table 21-2. There was no documented angling effort in Little Fish Lake during that period.

**Table 21-2. Summary of the Fish Lake Rainbow Trout recreational fishery during 1993–1997 (Taseko Mines Ltd. EIS, 2009)**

<b>Fishery</b>	<b>Fish Lake</b>	<b>Little Fish Lake</b>	<b>Fish Creek and Lake Tributaries</b>
Recreation site/road access	Yes/4x4	No/ATV	No/ATV
Annual angler-days	388–548	NA	NA
Annual mean catch/h	2.7–2.9	NA	NA
Annual total fish captured	4100–4900	NA	NA
Size range (FL [mm])	200–300 <sup>a</sup>	NA	NA
<b>NOTE:</b> <sup>a</sup> Retained by anglers. SOURCE: Appendix 5-3-J from the March 2009 EIS/Application.			

As part of the Fish Lake recreational fishery assessment, anglers were asked if they had fished in other lakes besides Fish Lake during that season. Their responses indicated that a total of 78 other lakes were fished by Fish Lake anglers during the 1995 to 1997 period (127 interviews), none being Little Fish Lake (Taseko Mines Ltd., EIS 2009). No road access or BC Recreation Site and the probability of a small population of Rainbow Trout likely contributes to the lack of fishing effort in Little Fish Lake.

### Little Fish Lake Aboriginal Fisheries Values

Records of Aboriginal fishing activity in Little Fish Lake are sparse. The Tsilhqot'in National Government (TNG 2009) describes intense historic and current use of the cabins at Little Fish Lake, primarily as a base for hunting, trapping, ranching, habituation, plant gathering and is of

spiritual significance, but a general absence of any recorded fishing activity, specifically in Little Fish Lake (Map 4C).

Table 21-3 summarizes the land use and cultural value of the New Prosperity Mine area for selected Tsilhqot'in members.

**Table 21-3. Current land use and cultural heritage values in and adjacent to the proposed New Prosperity mine site as described by Tsilhqot'in members in TNG's 2009 report to CEAA (TNG 2009).**

<b>Tsilhqot'in Member</b>	<b>Reference to the New Prosperity Mine Site</b>	<b>Specific Reference to Little Fish Lake*</b>	<b>Reference to Fishing at Little Fish Lake*</b>
Lloyd Myers	"Mr. Myers himself continues to go to the mountains east of the Taseko Lakes including Red Mountain each year with his family for hunting and medicines, meeting up with and seeing other Tsilhqot'in families"	No	No
Joseph William	"As an adult, Joseph William hunted all around Teztaun (Fish Lake), Jididzay (Onion Lake), Nabas Dzelh (Anvil Mountain), Bisqox (Beece Creek), Gwetex Natel?as (Red Mountain), Chita Creek, Chita Meadow and down through Taylor Windfall."	No	No
Norman George Setah	"Mr. Setah identified the entire Nabas region right up to Dasiqox Biny as Tsilhqot'in hunting grounds that he has used for deer, squirrels, muskrats, otters, rabbits, fisher, wolverine and moose."	No	No
Julie Quilt	"Ms. Quilt testified that she would go to Gwetex Natel?as (Red Mountain) with her husband Pascal and his parents in the fall to prepare for winter by hunting deer, groundhog and moose and also gathering pine nuts, mountain potatoes, berries and Indian hellebore. Ms. Quilt testified that a lot of other Tsilhqot'ins who would be there at the	No	No

Tsilhqot'in Member	Reference to the New Prosperity Mine Site	Specific Reference to Little Fish Lake*	Reference to Fishing at Little Fish Lake*
	same time and Pascal's parents ?Andeliyan and Eliza taught her that Tsilhqot'ins had been using this area since the time of the ?esgidams."		
Cecelia Quilt	"Both she and her father hunted on Nabas Dzelh every summer and fall; her father, Bigad and Yellicy all taught her that Tsilhqot'ins had hunted on Nabas since the time of the ?esgidams. (b) Ms. Quilt averred that Tsilhqot'ins including Jimmy Bulyan and her father camped and hunted at Bisqox (Beece Creek) and her father taught her Tsilhqot'ins had been using that area since the time of the ?esgidams. (c) Cecelia Quilt gave evidence that the northern part of the Eastern trapline, including the area around Nabas, was an ancestral trapping ground. (d) Cecelia Quilt averred that her family fished at Teztaun (Fish Lake) and her parents and Yellicy taught her that Tsilhqot'ins had been doing that since the time of the ?esgidams. Her aunt Madeline Hance taught her that an old Tsilhqot'in lady who used to fish at the lake is now buried there."	No	No
Christine Cooper	"Christine Cooper was born and spent the first years of her life living year-round in the area around Dasiqox Biny and Dasiqox. Her father was also born and raised in the Dasiqox area. Her parents had a cabin in the meadow around Nabas where Jimmy Bulyan's family and Henry Solomon's family later stayed."..."Her mother fished for dek'any (Trout) at Teztan (Fish Lake), and trapped all winter when living around Nabas."	No	No

<b>Tsilhqot'in Member</b>	<b>Reference to the New Prosperity Mine Site</b>	<b>Specific Reference to Little Fish Lake*</b>	<b>Reference to Fishing at Little Fish Lake*</b>
Gilbert Solomon	"Gilbert Solomon testified that he had seen house pits at Teztaun Biny (Fish Lake) and had been taught by his father Henry Solomon, William Setah, Jimmy Bulyan's wife Amelia, Eugene William and other elders that the ?esgidams lived, hunted and fished at Teztaun Biny. (a) Gilbert Solomon averred that while his family was living in the meadow at Nabas, he hunted with his family in Nabas for deer and moose. (b) Mr. Solomon defined Nabas as follows: "The English name for Nabas is Anvil Mountain, but Nabas also refers to a large area around the mountain; it is the area on the east side of the Taseko River between Anvil Mountain and Teztan (Fish Lake)."	No	No
Harry Setah	"Harry Setah included Fish Lake through to Anvil Mountain, Red Mountain and down into Taylor Windfall as part of his extensive adult summertime deer and moose hunting area, which he used as recently as 2 years prior to testifying. In spite of his busy summer schedule (he is a park ranger), Mr. Setah tries to go to the Red Mountain area every year. (f) On his frequent fishing trips to Teztan (Fish Lake) and Jididzay (Onion Lake) Mr. Setah and his family also hunt for deer and moose, blue grouse and rabbits."	No	No

\* In all text related to the individual's testimony, not just the selected text shown in this table.

## Conclusion

It is unlikely that Little Fish Lake supported/supports a sustainable, perennial fisheries of any type. Because there is no fishery value associated with Little Fish Lake, there will be no effect on the local fishery resources resulting from its loss.



**References**

BC Hydro. 2013. "Fish Species: Rainbow Trout." *The Peace/Williston Fish and Wildlife Compensation Program (PFWWCP)*.

[http://www.bchydro.com/pwcp/fish/rainbow\\_trout.shtml](http://www.bchydro.com/pwcp/fish/rainbow_trout.shtml).

Kerr, S. J., and T. A. Lasenby. 2000. *Rainbow Trout Stocking In Inland Lakes and Streams: An Annotated Bibliography and Literature Review*. Peterborough, ON: Fish and Wildlife Branch, Ontario Ministry of Natural Resources.

T'silhqotin National Government. 2009. "Tsilhqot'in Current Use of Lands and Resources for Traditional Purposes: Submission to the Prosperity CEEA Panel, November 2009."

Taseko Mines Ltd. 2009. "Environmental Impact Statement for the Prosperity Gold-Copper Project." [http://www.ceaa.gc.ca/050/documents\\_staticpost/44811/32276/v5d016.pdf](http://www.ceaa.gc.ca/050/documents_staticpost/44811/32276/v5d016.pdf).

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