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A Survey of Day Lake and its Inlet and Outlet Streams

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Summary

Day Lake was surveyed on October 21st and 22nd 1993. The lake is situated among rolling hills with some clear cuts in the area. A small camping and boat launch facility exists at the lake and the lake has reasonable access for the general public.

Only one adult rainbow trout, seven squawfish and one large scale sucker were caught in the gill net set in Day Lake. No fish were captured in minnow traps set in the lake. In addition, two inlets and one outlet were surveyed at the lake. Only the Day Lake outlet provided suitable rainbow trout spawning and rearing habitat and rainbow trout parr were observed and caught in the outlet. One of the inlets offered minimal rainbow trout spawning habitat, but presented good rearing habitat. Beaver dams limit the access to the outlet stream, but are likley passable during spring floods. Past logging practices likely have detrimental effects on the only section of stream found to contain suitable spawning habitat. Beavers may limit access to the outlet, but are likely passable during spring floods.

1.0 Introduction

Day Lake was surveyed as a part of the Burns Lake-Houston small lakes project in which a total of 10 lakes were examined: Sunset, Gilmore, Swans, Lars, Old Man, McBrierie, Elwin, Watson, Day, and Bulkley lakes. Recent reports of serious declines of the rainbow trout sport fishery in this region have created a need for information on the annual recruitment and relative species composition at these lakes. The intent of this project was to survey fish communities, and to report existing conditions at the inlet and outlet streams at each of these 10 lakes. The most recent concern has been an outburst of beaver activities which appear to have affected annual recruitment of rainbow trout by blocking many or all of a lake's streams with impassable dams. The primary focus of this work was on description of inlet and outlet streams as assessments of available rainbow trout spawning sites and to give recommendations for possible habitat enhancements at these small lakes.

2.0 Materials and Methods

2.1 Study Site

Day Lake (lat: 54° 25′, long: 126° 15′) is located 25 km east of Houston and is accessible by most vehicles (for directions see Appendix 1). A small campground and boat launch facility is located at the north end of the lake (Figure 1). There is one house 100 m west of the campground, and another on

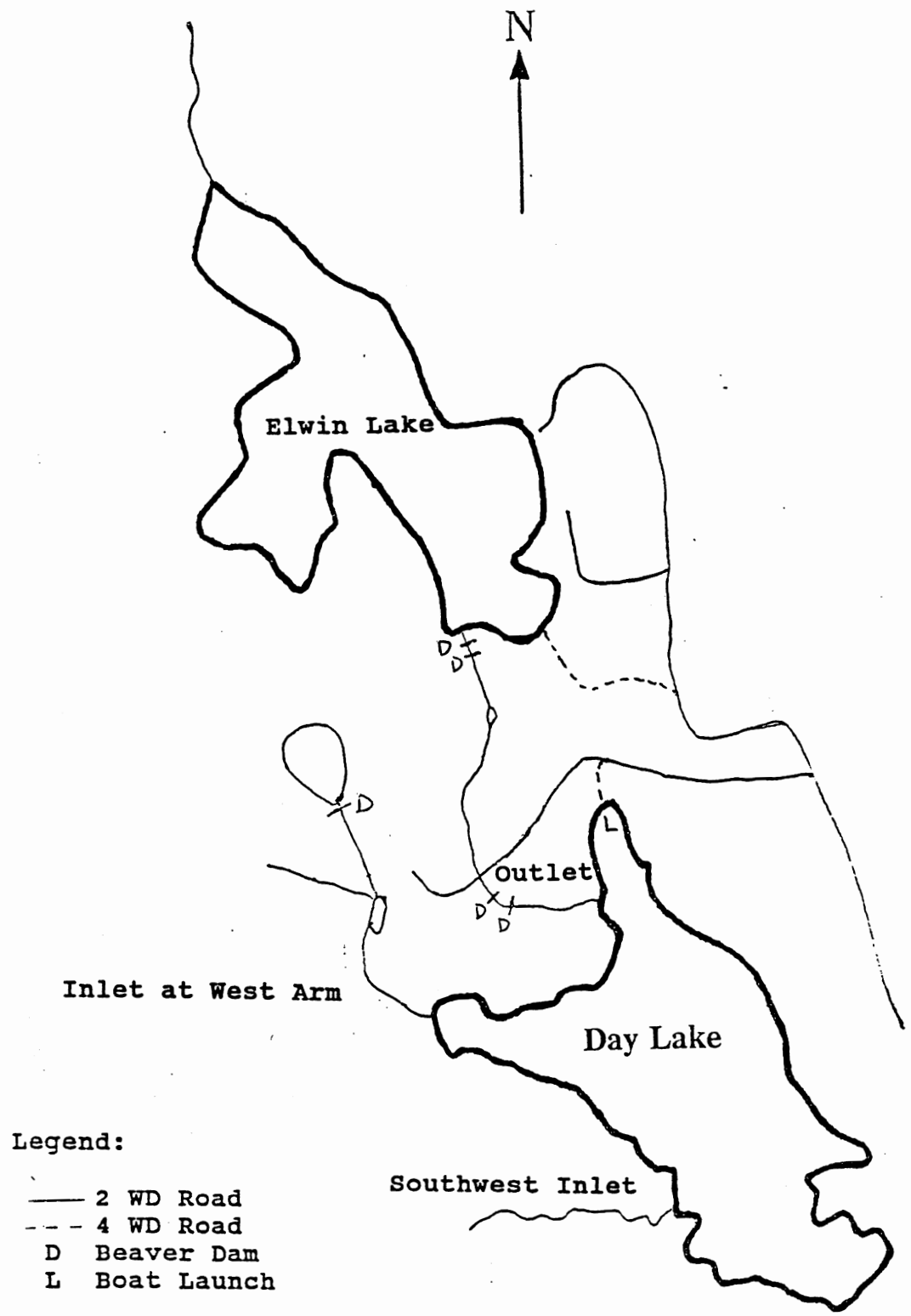

Figure 1. Map of Day Lake and Elwin Lake

the east side of the lake.

This survey of Day Lake included two inlets and one outlet (Figure 1). The larger of the two inlet streams is located in the west arm of the lake and the smaller inlet is at the southwest corner of the lake. The outlet is on the west side of the north arm of the lake and it drains north into Elwin Lake as part of the Bulkley drainage (Saimoto, 1993).

2.2 Evaluation of Day Lake

General descriptions were made of Day Lake's surrounding geography and flora. A 30 m gill net (15 m with 30 mm mesh, 15 m with 50 mm mesh) was set in the north arm of the lake (Figure 1). In addition, four minnow traps were set along the shore near the boat launch. Fish that were captured were identified, measured to the nearest mm (fork length), and released when possible.

2.3 Evaluation of inlets and outlet

Inlets and outlets were surveyed by visual observations while walking along the streams for as far as seemed necessary to assess spawning and rearing habitat for rainbow trout. Photographs were taken to represent general characteristics of the streams and to illustrate any obstructions to fish migration. Four minnow traps (baited with processed cheese) were set in the outlet stream to test for the presence of rainbow trout parr and other small fish (fork lengths: 25 - 100 mm). Fish captured in these traps were identified, measured to

the nearest mm (fork length), and released.

3.0 Results

3.1 Day Lake

Day Lake is situated among rolling hills, north of Elwin Lake. Mature forests that remain at the lake are primarily spruce and pine. However, clear cuts that were not satisfactorily replanted are present in several areas surrounding Day Lake. The substrate along the shoreline consists of a mixture of mud and gravel. Both inlets were surrounded by marsh area. The lake bottom appeared to drop off gently and the water was relatively clear.

Few fish were caught in the gill net set near the boat launch for 20 hours (overnight). The gill net catch consisted of one rainbow trout (*Oncorhynchus mykiss*), seven northern squawfish (*Ptychocheilus oregonensis*) and one large scale sucker (*Catastomus macrocheilus*). Fork lengths of all fish caught in Day Lake are summarized in Appendix 2. Four minnow traps set near the boat launch for five hours caught no fish.

3.2 Southwest inlet

This inlet is the smaller of the two inlets draining into Day Lake (Figure 2). The inlet stream bed was dry, although the substrate was still muddy at the time of the survey (Figure 3). The stream bed was 1 m wide for the initial 30 m above the lake, beyond which it widened into a pool. The stream bed was

Figure 2. The southwest inlet of Day Lake, looking upstream from lake.

Figure 3. Southwest inlet of Day Lake looking downstream.

surrounded by a marsh for the initial 20 m above the lake, and there was negligible cover. Cover increased to 90 %, primarily from trees, above this point. The pool still contained some water, and the substrate was muddy. Above the pool, the stream bed was 1 m wide and remained dry for at least an additional 200 m. No signs of beaver activities were noted. Due to the temporary nature of this stream, it is unsuitable for rainbow trout spawning and rearing.

3.3 Inlet in west arm

Several beaver houses are located near the inlet at the west arm of the lake (Figure 4). The inlet stream ranged in width between 10 and 20 m, exhibited no flow, and the substrate was very muddy (Figure 5). It was impossible to hike along the shore of the stream, which resembled a swamp at this point. Judgment of distance was therefore difficult. Approximately 1 km above the lake, the stream was blocked by an impassable beaver dam. The dam appeared old, but solid and was overgrown with terrestrial vegetation (Figure 6). For 100 m downstream of the dam, the inlet stream narrowed to 4 m, and had minimal habitat for rainbow trout spawning. Cover increased from almost 0 % to 75 % just downstream of the dam. The dam was approximately 40 m long, and was impassable to fish. Water level on the upstream side of the dam was 1 m higher than below the dam. Some seepage of water through a small hole recently repaired was noted. The inlet consisted of a large, stagnant pool above the dam, with a width of 30 m at its narrowest point.

Figure 4. Inlet at the west arm of Day Lake, including three beaver houses.

Figure 5. West arm inlet of Day Lake, looking upstream from 300 m above lake.

Figure 6. Looking downstream at beaver dam at west arm inlet approximately 1 km above the Day Lake.

Figure 7. Looking upstream at small lake above beaver dam of west arm inlet.

The transition between this pool and a small lake just above it was indistinguishable (Figure 7). Six beaver houses were seen from the shore of this small lake. No fish were observed and no traps were set in this location.

3.4 Outlet

The Day Lake outlet drains Day Lake into Elwin Lake (Figure 8). The outlet was dammed 500 m downstream from the lake. The section of the outlet stream above the dam consisted of a large pool (20 - 30 m wide, 40 cm deep) (Figure 9), with a deep channel, about 5 m wide and 120 cm deep, in the centre of the pool. It was possible to navigate the boat to the dam from the lake through the deeper section of the pool. The substrate above the dam consisted primarily of sand and mud and was not suitable as rainbow trout spawning habitat. Dead willows and aspen were found in the marshy area around the pool, as well as in shallow sections. The beaver dam was approximately 20 m across, and 1 m high (Figure 10). A recent break through the dam was repaired. A pool below the first beaver dam stretched to the second beaver dam. This pool was about 10 m long, 15 m wide and 1 m deep in the centre. Substrate in the pool was muddy and sandy. The second dam was 15 m long, and the top of the dam was level with the water on the upstream side of the dam. The water level on the downstream side of the dam was 1 m lower. The outlet narrowed to 1 - 2 m wide and 10 cm deep below the second beaver dam, and the substrate consisted of a mixture of sand and gravel. This stretch of stream remained relatively consistent

Figure 8. Day Lake outlet to Elwin Lake.

Figure 9. Looking upstream from beaver dam in Day Lake outlet stream.

Figure 10. First beaver dam at the outlet of Day Lake.

Figure 11. Day Lake outlet looking upstream from logging road. Note the clear cut to the edge of the stream.

for the next 300 m, to the logging road crossing. Overhanging shoreline grass and abundant organic debris provided cover for this section of the stream 100 m below the dam. However, most of the stream has been logged to the edge, with little terrestrial vegetation remaining at the edge of the stream. A steep slope, which has also been logged and not satisfactorily replanted, formed the north bank of the stream, where erosion and run off are likely serious problems (Figure 11). The flow below the second dam was good (about 1 m/sec), and there was adequate spawning habitat for rainbow trout. However, both beaver dams were impassable to up migrating fish at the time of survey. It is likely that downstream migration is possible during higher water levels. 250 m below the dam, the width of the stream varied between 1 and 3 m, and depth was between 40 and 50 cm. Cover consisted of large organic debris (10%) and overhanging grass (10%). Flow was variable, with faster flows in riffles (1m/sec) and slower flows in pools. The sandy component of the substrate increased, and grasses grew in shallower sections of the stream. Habitat was primarily suitable for rearing rather than spawning, although the lack of cover may jeopardize juvenile survival. A culvert under the logging road allowed for migration of fish (Figure 12). The stream was again logged right to the edge below the culvert. The substrate below the culvert consisted of 60 % rock, 30 % gravel and 20 % sand. The section of stream 10 m immediately below the culvert contained suitable spawning habitat in some places. The next 150 m of the stream was similar to the section

Figure 12. Culvert under the logging road at the Day Lake outlet stream.

just above the culvert, and was suitable for rainbow trout rearing habitat. An old, broken through beaver dam was found 25 m above the culvert, and was passable to fish at the time of the survey. The lower parts of this outlet are described in more detail in the Elwin Lake survey (Saimoto 1993). However, no

suitable spawning habitat was found near Elwin Lake, and beaver activity severely limit access to lower sections of this stream from Elwin Lake.

Four minnow traps were set for 24 hours above and below the logging road crossing. Rainbow trout parr were seen above and below the logging road crossing and some were noticed hiding under the trap as the traps were retrieved. 10 rainbow trout parr and one large scale sucker were captured in the minnow traps (see Appendix 3 for FL of these fish).

4.0 Discussion

Day Lake is relatively pristine, and access in addition to camping and boat launch facilities are present. Day Lake is frequented by hunters and some fishermen (Hudder pers. com.). Evidence of recent campers (litter) was found at the boat launch area. The turn off to the boat launch appears to be used as somewhat of a garbage site. An old washer, stove and drier were littering this area.

The low number of fish caught in the gill net was unusual. The catch at Day Lake with the gill net was the smallest of any of the lakes in which the gill net was set. The low number of fish in the net could be due to the location of setting. The net was attached to an old dock, on the shore of the lake. It is possible that setting the gill net away from the boat launch and in deeper water may have resulted in a larger catch. However, the gill net does indicate that adult rainbow trout are

present in the lake. Only one rainbow trout was caught, but in light of the low abundance of other species caught, this does not indicate the absolute abundance of rainbows in the lake. It is unclear what the present state of recruitment is in Day Lake.

The inlets surveyed at this lake presented no useable rearing or spawning habitat for rainbow trout. Enhancement at either of these streams to improve the quality of the habitat for rainbows would not be constructive or essential.

Spawning and rearing habitat were found in the Day Lake outlet stream. The presence of rainbow parr indicates that this stream is being utilized by rainbow trout. It is unclear whether the beaver dams upstream of the spawning and rearing habitat are passable by fish. A visit to this stream during spring flooding would be valuable to assess this possibility. In addition, previous logging practices appear to have left the stream vulnerable to siltation and predation. The fisheries values of streams and lakes should be impressed upon the logging company responsible for these practices. Removal of beavers and/or their dams is a short term solution to a recruitment problem. However, riparian restoration should lead to a long term improvement in the quality of spawning and rearing habitat in the stream.

5.0 Recommendations

5.1 The only suitable spawning and rearing habitat for both Elwin and Day Lake was found in the Day Lake outlet/ Elwin Lake inlet stream. It is unclear whether this habitat is accessible to both stocks or not. It is therefore recommended that this stream be revisited during the spring floods to assess which stocks can utilize this section of stream.

5.2 The outlet of Day Lake has been logged to the edges of the stream in the section where most of the valuable spawning and rearing habitat exists. It is important that this section be replanted as soon as possible to prevent further siltation and erosion and to increase cover for the stream.

References

Saimoto, R.S. 1993. An inventory of Elwin Lake and its inlet and outlet streams. Ministry of Environment, Fisheries Branch, Smithers, B.C., on file.

Appendix 1. Directions to Day Lake.

0 km	Turn south from highway 16 onto Forestdale Canyon Rd.
3 km	Turn right onto Crow Creek Rd.
4.4 km	Stay left at fork, and cross the railroad and Bulkley River.
6.2 km	Turn right on Day Lake Rd.
10.2 km	Turn left (Hudder Farm Gate is too far)
10.5 km	Turn left to Day Lake campground and boat launch.

Appendix 2. Fork lengths (mm) of fish caught in the gill net that was set in Day Lake for 20 hours.

Rainbow trout (N = 1)

325 mm (female)

Northern squawfish (*Ptychocheilus oregonensus*) (N = 7)

127 238 246 149 249 256 136

Large scale sucker (*Catastomus macrocheilus*) (N = 1)

227 mm

Appendix 3. Fork lengths (mm) of fish captured in minnow traps that were set in the Day Lake outlet stream at the logging road culvert.

Rainbow trout parr (*Oncorhynchus mykiss*) (N = 10)

75 68 73 82 61 64 66 60 70 70

Large scale sucker (*Catastomus macrocheilus*) (N = 1)

75 mm