

Homework #23 – Shoal Habitats

An investigation of shoal habitats in Lac de Gras that may be utilized by spawning Lake Trout and other dominant fish species (Round Whitefish and Cisco) was conducted during the period of August 10, 1996, to August 28, 1996, inclusive (Golder 1997).

A total of 181 shoals (160 in Lac de Gras and 21 in Lac du Sauvage) were characterized during the summer study. Based on the many features examined, each shoal was assigned a spawning-habitat quality ranking for each of the three main species of fish. In order to evaluate and confirm the spawning-habitat potential of the shoals for lake trout, several of these, as well as a number of unexamined shoals, were monitored for any evidence of spawning activity during the fall survey.

Each shoal was examined for substratum composition (size of the material), depth, shape of the material (round vs. angular), presence of interstitial spaces, slope of the shoal and cleanliness of the material (e.g., silt-covered, epilithic algae). Based on these characteristics, the shoals were then assessed for their potential as spawning habitat for each species and given a score according to the ranking scheme presented in Table 1.

TABLE 1

SPAWNING HABITAT CRITERIA AND RANK FOR LAKE TROUT, CISCO AND ROUND WHITEFISH

	Lake trout				Cisco				Round whitefish			
Physical habitat	Good	Fair	Poor	Unsuitable	Good	Fair	Poor	Unsuitable	Good	Fair	Poor	Unsuitable
Substratum type ^a	Bo or C	Bo or C	Bo/C with G or G	Be or CS	G or C or Bo	G or C or Bo	Bo or S	Be or CS	G or C	Bo or C/G	Bo or S	Be or CS
Substratum size	5 - 30 cm	5 - 60 cm	> 1 cm	< 1 cm	1 - 30 cm	1 - 60 cm	> 1 mm	< 1 mm	0.5 - 6 cm	0.5 - 20 cm	> 1 mm	< 1 mm
Min. depth	2 m	1.5 m	< 3 m	< 3 m	< 3 m	< 3 m	< 3 m	< 3 m	4 m	< 4 m	< 4 m	< 4 m
Max. depth	> 3 m	> 1.5 m	> 1.5 m	> 1.5 m	> 3 m	> 1.5 m	> 1.5 m	> 1.5 m	20 m	> 20 m	> 20 m	> 20 m
Slope of rock substratum	30 - 50°	15 - 50°	> 0°	> 0°	10 - 25°	10 - 25°	> 0°	> 0°	10 - 25°	10 - > 25°	> 0°	> 0°
Substratum shape	Angular	Angular or round	Angular or round	N/A	Angular or round	Angular or round	Angular or round	N/A	Angular or round	Angular or round	Angular or round	N/A
Substratum cleanliness	Clean	Some silt	Silt/algae covered	N/A	Clean	Some silt or algae	Silt/algae covered	N/A	Clean	Some silt	Silt/algae covered	N/A
Depth of interstitial spaces	> 20 cm	> 10 cm	> 3 cm	N/A	> 5 cm	> 5 cm	> 1 mm	N/A	> 5 cm	> 5 cm	> 1 mm	N/A
Exposure to predominant wind and wave action	Full exposure	> 180° exposure	< 180° exposure	N/A	Full exposure	> 180° exposure	< 180° exposure	N/A	Full exposure	> 180° exposure	< 180° exposure	N/A

a - Bo = boulder (> 25 cm), C = cobble (> 6.5 cm), G = gravel (> 0.2 cm), S = sand (> 0.06 mm) and CS = clay/silt (<0.06 mm); Golder (1997)

Reference

Golder. 1997a. Technical Memorandum #12-2, Shoal Habitat Survey, Lac de Gras and Lac du Sauvage, Summer 1996. Environmental Baseline Program. Submitted to Diavik Diamond Mines Inc. Yellowknife, NWT, Canada. Doc No. TM12-2.