

APPLICATION FOR ECOLOGICAL RESERVE

0318821

1. Legal description of the area (or general "Metes and bounds" description)
2. Geographical location (relate to nearest settlement, mountain, river, etc.)
Boulton Lake between Port Clements and Masset, QCI, B.C.
3. Indicate the biogeoclimatic zone of which the reserve is representative.
Coastal Western Hemlock Zone
4. Approximate total acreage.
320 acres
5. Purpose of the reserve.
 - (a) Primary (state acreage)
To protect a morphologically unusual but endangered population of three-spined sticklebacks, Gasterosteus aculeatus. 320 acres would encompass and protect the present quality of surface water draining into the lake. Introduction of other fishes could be disastrous to the population.
 - (b) Others if any.
 - (c) Buffer areas
6. Map attached
7. See accompanying description.

Signature A. E. Peden (S.W.)
I. B. P. Surveyor

CHECK SHEET (Mark VII) FOR SURVEY OF IBP AREAS*

To be completed with reference to the GUIDE TO THE CHECK SHEET

Serial Number

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For Data
Centre Use
only

1. 1. Name of surveyor Alex E. Peden
2. Address of surveyor .. B.C. Provincial Museum
- Victoria, B.C.
- Canada
3. Check Sheet completed (a) on site (b) from records XX
4. Date Check Sheet completed

2. 1. Name of IBP Area Boulton Lake
2. Name of IBP Subdivision (or serial letter)
3. Map of IBP Area* showing boundaries attached? Yes ... XX . No
4. Sketch map of IBP Area*. Please mark direction of north, the scale and grid numbers where applicable.

See attached map segment from

Masset Sound Sheet
B.C. Dept. Lands and Forests
103 F/16 E
(Second edition, 1966)

* For "IBP Area", read IBP Area and/or IBP Subdivision.

3. Location of IBP Area*

1. Latitude53.....°47'..... N Longitude132.....° 06'..... W

2. CountryCanada.....

State or ProvinceBritish Columbia..... County

(State or Province County

4. Administration

National 1. Official category

2. Address of administration

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.....

.....

.....

International Class

3.

Included in U.N. List	Rejected from U.N. List	Area with formal conservation status	No formal cons. status
(A)	(B)	(C)	(D)

5. Characteristics of IBP Area*

1. Surface area (state units of measurement)320.....acres.....

2. Altitude (state units of measurement) Maximum200.....feet.....

Minimum190±.....feet.....

6. Climate

Nearest climatological station :

1. NameMasset.....

2. Climatological station on IBP Area*? Yes NoXX ..

3. If (2) not, distance from edge of IBP Area* (state units) ...16.....miles.....

4. Direction from IBP Area* ...North.....

5. Additional data sheet attached? Yes NoXX....

11. Freshwater within IBP Area*

1.

	Permanent	Intermittent
General		
Standing	XX	
Running	Not present during survey.	

2. Standing Water

	Permanent	Intermittent	Unproductive	Productive
Swamps				
Ponds				
Lakes	XX			

3. Running Water

	Permanent	Intermittent
Springs, cold		
Springs, hot		
Streams		
Rivers		

4. Special freshwater features ...Small shallow lake with brown-stained
 ...water and adjacent to raised bog,.....

12. Salt and Brackish Water within IBP Area*

Salt Lakes	<input type="checkbox"/>	Lagoon,	<input type="checkbox"/>	<input type="checkbox"/>
Estuaries	<input type="checkbox"/>	Salt pools	<input type="checkbox"/>	<input type="checkbox"/>

13. Adjacent Water Bodies (not within IBP Area*)

1. Fresh Lake River None
 Stream

2. Salt and Brackish

Estuary	Salt lake	Salt pool	Lagoon	Ocean		

9. Landscape

1. General Landscape (give brief description) Shallow brown-stained lake;
 ..coniferous forest, raised bog.....

2. Relief Type

	Flat	Undulating (0)-200 m.	Hilly 200-1000 m.	Mountainous > 1000 m.	%
Sharply dissected					
Gently dissected	50	50			100
Incised					
Skeletonised					
%	50	50			100%

3. Special landscape features (list)

.....

.....

10. Coastline of IBP Area*

1. Protected bays and/or inlets Many Few None

2. Substratum. % of coast

Rock	Boulder Beach	Shingle Beach	Sand Beach	Shell Beach	Mud	Coral	Ice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Physiography. % of coast

Cliffed	Sloping	Flat
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Special Coastal Features (list)

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5. Tide. Maximum range (state units of measurement)

6. Total length of coastline :

Less than 1 km. 1-10 km. Above 10 km.

14. Outstanding Floral and Faunal Features

1. None

2. Fauna

	Species diversity	Abundance of individuals	Superabundance of individuals	Rare species	Threatened/Relict species	Spp. of biogeographical interest	Exceptional Associations	Breeding or Nesting Populations	Migrating Populations	Wintering Populations	Threatened unique population
Mammalia											
Aves											
Reptilia											
Amphibia											
Pisces		XX				XX		XX			XX
Insecta											

3. Names of main threatened, endemic, relict and rare species

Gasterosteus aculeatus - unique population

4. Flora

	Species diversity	Abundance of particular species	Rare species	Threatened/relict species	Spp. of biogeographical interest	Exceptional associations	Outstanding specimens				
Angiospermae :											
trees											
shrubs											
herbs											
grass											
Gymnospermae											
Pteridophyta											
Bryophyta											
Lichens and Algae											

5. Names of main threatened, endemic, relict and rare species

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.....

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15. Exceptional interest of IBP Area*

..... A unique population of Gasterosteus in which about 95%
 of the population lack dorsal or pelvic fin spines.

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16. Significant Human Impact

1. General : None in entire IBP Area*
 None in part of IBP Area*
 Impact on entire IBP Area* **XX**

2. Particular

	Past impact	Present impact	Trend			
			Increasing	Decreasing	No change	No information
Cultivation						
Drainage		XX	?			
Other soil disturbance		XX	XX			
Grazing						
Selective flora disturbance						
Logging						
Plantation						
Hunting		XX	XX			
Removal of predators						
Pesticides						
Introductions — plants						
Introductions — animals		XX	XX			
Fire						
Permanent habitation						
Recreation and tourism		XX	XX			
Research		XX			XX	
Highway construction		XX	XX			
Threatened by possible fish introduction		XX			XX	

3. Additional details on each type of impact attached?

Yes **XX** .. No

17. Conservation Status

	Protection			Utilisation			Conservation Management			Permitted Research		
	none	partial	total	none	controlled	uncontrolled	none	to alter status	to maintain status	experimental	observational	prohibited
Flora	X			X								
Fauna	X			X								
Non-living	X			X								

18. References

1. List major biological/geographical references for the IBP Area.

Sheet attached? Yes No

2. List main maps available for the IBP Area.

List attached? Yes No

3. Aerial photographs for the IBP Area available?

For whole area For part of area None

19. Other Relevant Information

See attached report.

Signed A. E. Peden,
(Surveyor)

PROPOSAL FOR ECOLOGICAL RESERVE AT BOULTON LAKE

Three-spined sticklebacks (Gasterosteus aculeatus) from Boulton Lake are very unusual compared to other sticklebacks in British Columbia because most individuals from this lake lack one or more fin spines. Studies by T.E. Reimchen indicate that 95% of the population lack at least one spine while 62% do not possess one dorsal and both pelvic spines (see figures 22 and 23). Such spines are a very important defensive mechanism of Gasterosteus against predators. Because black sticklebacks from Mayer Lake have larger spines and are heavily preyed upon by cutthroat trout, the relatively spineless Boulton Lake population provides a very striking comparison. Very significant is the fact that extensive collecting over a summer by Mr. Reimchen and other trips by Moodie and Pelen have failed to capture any other fish species and no predators other than a few diving birds. Because several studies have shown that trout tend to devour sticklebacks with shorter and less ominous spines, it is our opinion that any introduction of salmonid sportfish or similar predators would eliminate the more spineless fish until normal spined individuals remained. Because the spineless sticklebacks were probably isolated here for a very long time, they have apparently differentiated without competition from other fishes. Introductions of competitors, especially other stickleback populations should be avoided. To preserve this genetically unique component of British Columbia's fish fauna and to provide an example for ecological study of a population that likely differentiated under reduced selective

pressure from predation, I propose the Boulton Lake area as an ecological reserve. The population from here certainly provides excellent opportunity for experimental as well as field studies on the effects of natural selection.

Because this population of G. aculeatus from Boulton Lake is highly vulnerable to fish introductions, man-made disturbances due to the small size of the lake, and to alteration due to the construction of the Masset-Port Clements highway, I believe this unique population is in much greater imminent danger compared to the other populations of Gasterosteus and so I have proposed it for an ecological reserve.

Physical features

Boulton Lake (Figures 24 and 25) is a small body of brown-stained water less than $\frac{1}{2}$ mile long and $\frac{1}{4}$ mile wide. It lies at an elevation of about 190 feet about 7 miles north of Port Clements and within 200 yards of the Masset-Port Clements Highway. The inshore area tends to have a pebble bottom while coniferous and extensive raised bog habitats overgrow the lake edge to form a low vertical bank. Although available maps indicate an outlet at the north end of the lake, Moodie and Reimchen have extensively explored the entire circumference and have found no indication of any outlet through which salmonid fishes could immigrate. Possibly much of the inflow and outflow results from underground seepage and consequently the lake level and water quality could be affected to some extent by disturbances of groundwater in areas adjacent to the lake. Although some standing water occurs around the edge of the lake, no permanent tribu-

tary streams are known. Undoubtedly, run-off waters from the highway run directly to the lake through drainage ditches after heavy rains.

Figures 24 and 25 illustrate some of the terrestrial habitats around Boulton Lake. As indicated in my previous proposals, terrestrial biologists need to survey the biota around the lake.