

CRITICAL WATERFOWL HABITATS
IN BRITISH COLUMBIA

FRASER RIVER
ACTION PLAN

Patricia Hayes
Brent M. Matsuda
Ken R. Summers



CANADA'S GREEN PLAN
LE PLAN VERT DU CANADA

Canada



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ABSTRACT

As a supplement to the Cooperative Waterfowl Management Plan for British Columbia (British Columbia Waterfowl Technical Committee 1989), this report maps, describes, and provides general protection status for 38 wetland complexes and their associated uplands, currently considered to be critical for breeding, migrating, and wintering waterfowl. Only habitats considered to be of provincial or national significance were included. Habitats are identified within six main Geographical Units throughout British Columbia. Portions of some habitats receive some degree of protection through governments or private agencies; the remaining habitat is unprotected. Of the 215,651 ha of critical habitat mapped in this report, 189,842 ha (88%) has no formal protection. Knowledge of the location and status of these vital areas is essential for effective conservation and management of waterfowl populations.

RÉSUMÉ

En supplément au rapport "Cooperative Waterfowl Management Plan for British Columbia" (British Columbia Waterfowl Technical Committee 1989), le rapport suivant cartographie, décrit, et procure un statut général de protection pour 38 habitats humides et les hautes terres associées à ceux-ci présentement reconnus comme étant importants pour la reproduction, la migration, et l'hivernage de la sauvagine. Seuls les habitats considérés d'importance provinciale ou nationale ont été unifiés géographiques différentes en Colombie-Britannique. Certains habitats reçoivent une protection partielle de la part des gouvernements ou d'organismes privés; le reste des habitats n'est pas protégé. En somme, 189,842 ha ne sont pas actuellement protégés, ce qui représente 88% du total de la superficie (215,651 ha) étudiée dans ce rapport. Il est essentiel de déterminer l'emplacement et le statut de ces régions vitales pour une préservation et un aménagement efficaces des populations de sauvagine.

ERRATA

1. p.ii, paragraph 1, line 9; should read
189,566 ha not 189,842 ha
2. p.ii, paragraph 2, line 8; should read 189,566
ha not 189,842 ha
3. p.5, paragraph 2, line 4; should read 7.0% not
6.6%

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INTRODUCTION

In 1983, the British Columbia (B.C.) Waterfowl Technical Committee began to develop a Cooperative Waterfowl Management Plan for B.C. Information collated for this plan was used as part of Canada's input to the development of the North American Waterfowl Management Plan. As part of the B.C. plan, a list of wetlands critical to waterfowl was developed and attached to the final version of the Cooperative Waterfowl Management Plan for British Columbia (B.C. Waterfowl Technical Committee 1989). Wetlands described in this list were selected based on the numbers of waterfowl known or suspected to use those areas at some stage in the annual cycle. Only habitats considered by the Technical Committee to be of provincial or national significance to waterfowl were included. In 1985, three copies of map folios, at scales of 1:50 000 and 1:250 000, were produced detailing the location of these areas.

As the North American Waterfowl Management Plan became operational, and waterfowl management in B.C. improved, the Canadian Wildlife Service (CWS) undertook to update the 1983 critical wetlands list. Various agencies were contacted for their opinions on the validity of the old list. The need to include part of the uplands surrounding the wetlands also became apparent as their importance to waterfowl was recognized.

As a result of the update, this report maps, describes, and provides general protection status for 38 wetland complexes and their associated uplands that are currently known to be critical for breeding, migrating, and wintering waterfowl. These habitats, identified in the six Geographic Units of B.C. described in the Cooperative Waterfowl Management Plan for British Columbia (1989), are vital if populations of waterfowl are to be maintained. The habitat list presented in this report focuses primarily on wetlands from the perspective of the waterfowl manager and does not include all important wetland habitat in B.C. Nevertheless, the importance of wetlands to not only waterfowl but a large variety of other species, makes this list useful to other wildlife managers.

Although all landscapes are important for the preservation of biodiversity, some types of habitat and certain specific areas are biologically more productive and support a greater abundance of individuals and species. If an area of the province is not included in this report, it does not necessarily mean that it is not important, or even crucial, to waterfowl. Other critical waterfowl habitats probably exist that we are not yet aware of, as do important habitats for other species. This report describes 38 habitats that waterfowl managers currently know are vital for the maintenance of current populations. If these habitats are secured, waterfowl populations could potentially be maintained at 70% of mid-1970s levels (B.C. Waterfowl Technical Committee 1989).

METHODS

Information to update the 1983 waterfowl habitat list was collected in 1988 from the following sources:

- E. Hennan, Ducks Unlimited Canada (DU), Kamloops
- DU Surrey area office files
- DU area offices (through responses to a request by E. Hennan in 1988 and telephone conversations)
- information provided by B.C. Environment (BCE) of the Ministry of Environment, Lands and Parks (MOELP) regional offices in response to a request by B. Munro in 1988
- recommendations of the B.C. Waterfowl Technical Committee
- telephone discussions or visits with other agencies:
 - L. Jones, Pacific Estuary Conservation Program
 - R. Erickson, The Nature Trust of B.C. (TNT)
 - Salmon Arm Bay Nature Enhancement Society
 - District of Salmon Arm
 - L. McKintosh, B.C.E., Queen Charlotte City

The boundaries of the 42 Critical Wetland complexes illustrated on the 1985 folios were used again except where enlargements were recommended by the Technical Committee. All 42 wetland complexes are included in this report. Some uplands have been added and some wetlands have been grouped together resulting in 38 habitats being identified in this report.

Except where indicated on individual tables, all information presented in this report is current as of 1988. Land ownership and status was derived from records collected in 1990. Values presented for protected and unprotected land were provided by the managing agency. These values are not exact but are best estimates based on the methods described below.

The updated maps and status tables in this report include information on: surface area of wetland; surface area of upland; protected status; and ownership. For the purposes of this report, the following categories were used to classify the information on the 38 habitat complexes highlighted:

Wetland

Areas were considered wetlands if they were shown as open water on a 1:50 000 or 1:250 000 National Topographic System (NTS) map. Wet or seasonally flooded areas (indicated by marsh symbols on the NTS maps), when directly associated with open water, were also included under the wetlands

category. In addition, areas where DU projects are underway were considered wetlands even if they are not indicated on the maps in this report.

<u>Upland</u>	Non-flooded areas adjacent to wetlands were classified as upland habitat. Areas described as marsh on the NTS maps were also considered upland if they were not associated with open water. For coastal wintering habitat, all farmland adjacent to the wetland were included as upland; for example, the Boundary Bay area. In areas where adjacent farmland was non-existent, for example the northern coast, a buffer zone, as described below, was included.
<u>Protected</u>	Areas classified as protected include: Crown land transferred under Section 101 and Section 13 of the B.C. Lands Act to a management agency such as BCE (including Wildlife Management Areas (WMA) and Ecological Reserves); wildlife areas, sanctuaries, or parks owned by any level of government; lands held by private conservation agencies such as TNT; and areas under DU landowner agreements.
<u>Unprotected</u>	Unprotected lands include: vacant Crown land; Crown lands designated under B.C. Lands Act Section 11 or 12 or government map reserves (even if designated for wildlife or recreation); Section 101 lands managed for wildlife but not administered by BCE; private land not under DU agreements; Military Reserves; and Indian Reserves.
<u>Crown</u>	All land under the control of any level of government was considered Crown.
<u>Private</u>	Surveyed land owned in fee simple by any individual or non-governmental group was considered private.
<u>Other</u>	This category covers Crown designated restricted access lands that are not administered directly by government (i.e. Indian and Military Reserves).

Once the boundary of each habitat complex was delineated, the area of wetland and upland within each complex was determined by a combination of three methods: the area calculated for the 1985 maps; planimeter or 2x2 mm grid measurements from 1:50 000 and 1:250 000 NTS maps; and data on protected habitats from the various agencies responsible for them (most of these values are presented in Appendix A). If planimeter measurements or agency data on protected areas differed substantially from the 1985 value, the values were changed accordingly.

For interior habitats, uplands adjacent to breeding marshes are essential. For small wetlands and other water bodies, the critical upland area was calculated as three times the area of the wetland, in accordance with levels set on the Prairies by the North American Waterfowl Management Plan. Larger open water bodies, such as large lakes, have large portions of their

areas not used by breeding waterfowl. In these cases, critical upland was considered to be the area within 300 m of the perimeter of the lake or contiguous marsh. Small wetlands were defined as those 28.26 ha or smaller. This is the size at which a 300 m buffer around a lake becomes equivalent in hectares to three times the area of open water.

Exceptions to these methods occurred for areas where upland habitat was the key to obtaining access to an area, such as Tofino Flats, where it was included in the measurement. If an upland area was already protected and exceeded the amount of wetland it surrounded, the total protected area was included; for example, Stum Lake Provincial Park and some TNT properties. The calculations for some of the wetland complexes, such as Osoyoos, Columbia River, and Creston, included intermixed upland and wetland which was difficult to depict at 1: 50 000. In these cases, no additional upland was included unless a specific site had been identified as a necessary component of the habitat.

In 1993, the accuracy of these measurements was verified using CAD (computer assisted drawing) software and a digitizing tablet. If the values were substantially different from the original planimeter readings and not due solely to known areas of protected habitats, the values derived from the digitizer were considered more accurate. An average of three digitized measurements was used in these cases.

RESULTS AND DISCUSSION

An index map depicting the 38 critical waterfowl habitats is illustrated in Figure 1. Each numbered rectangle represents a detailed map of the critical habitats. Starting on Page 9, maps are presented together with tables that describe the habitat's location, protection, and ownership status. Some maps illustrate the boundaries of more than one habitat complex; for example Map I. Larger habitat complexes, such as the Skeena Complex (Map IIa, IIb, IIc, and IVd), are illustrated on more than one map.

Areas on each map bounded by **heavy lines** are considered wetlands; areas shaded are uplands. Some habitat complexes cover a large geographical area and contain more than one wetland and/or upland. In these cases, all wetlands indicated within the black line are included in the data. Uplands surrounding small wetlands less than 28.26 ha may not be depicted on the maps due to scale. In these cases, the area of the upland was calculated as described in the methods, and are included in the tables.

Table 1 shows the amount of critical waterfowl habitat identified within each Geographical Unit. A total of 215,651 ha of critical habitat are identified in B.C. Although overall the habitat complexes consist of twice as much wetland as upland, the Southern Interior, Central Interior, and Alberta Plateau Units are comprised of more upland than wetland. Much

of this results from the dispersion of breeding ponds throughout the landscape. The Coast and Southern Interior Units contain the greatest amount of critical waterfowl habitat (Table 1). Much of this consists of coastal bays, estuaries, deltas, and marsh lands where waterfowl tend to congregate during migration and over winter. Degradation to these essential wintering habitats and migration stop-overs could potentially have serious detrimental effects on population levels and future reproductive success.

Approximately 88% of the 215,651 ha discussed in this report is unprotected. The percentage protected varies between Geographical Units; for example, 41.9% of the critical waterfowl habitats in the Kootenays are protected, while none are protected in the Northern Interior (Table 2). Only 6.6% of coastal habitats are currently protected. These habitats may be considered the most important habitats due to the concentration of migrating and wintering birds. Although habitats in the northern regions may be under less immediate threat than those further south, they are just as critical. Further research is needed, particularly in the northern regions, to truly assess the value, location, and threats to waterfowl habitat.

CONCLUSIONS

Effective preservation and management of migratory birds requires knowledge of areas that are vital to their survival. The Migratory Bird Habitat Conservation Strategy, Pacific and Yukon Region (Canadian Wildlife Service 1992), states that identification of critical habitats is an important first step towards long-term securement and maintenance of biodiversity. This report has contributed to this process and, together with others, will aid wildlife managers in developing more efficient surveys and studies, and stress the importance of these sites to individuals involved in environmental planning and policy.

Identifying important areas is not enough; securement and management action must be taken. In addition, simply protecting isolated pockets of bird habitat will not adequately preserve biodiversity and species abundance. Good land stewardship must be practised everywhere.

Table 1:

Amount of critical wetland and upland waterfowl habitat in each Geographic Unit.

Geographic Unit	Area (ha)		
	Wetland	Upland	Total
Coast	61,049	23,592	84,641
Southern Interior	26,613	36,158	62,771
Kootenays	26,083	564	26,647
Central Interior	7,982	8,850	16,832
Northern Interior	19,624	0	19,624
Alberta Plateau	2,136	3,000	5,136
Total for Province	143,487	72,164	215,651

Table 2:

Amount of critical habitat within each Geographic Unit that is protected and unprotected.

Geographic Unit	Area (ha)				
	Protected		Unprotected		Total
	ha	%	ha	%	
Coast	5,892	7.0	78,749	93.0	84,641
Southern Interior	7,254	11.6	55,517	88.4	62,771
Kootenays	11,173	41.9	15,474	58.1	26,647
Central Interior	850	5.0	15,982	95.0	16,832
Northern Interior	0	0	19,624	100	19,624
Alberta Plateau	916	17.8	4,220	82.2	5,136
Total for Province	26,085	12.0	189,566	88.0	215,651

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CRITICAL WATERFOWL HABITAT MAPS AND STATUS

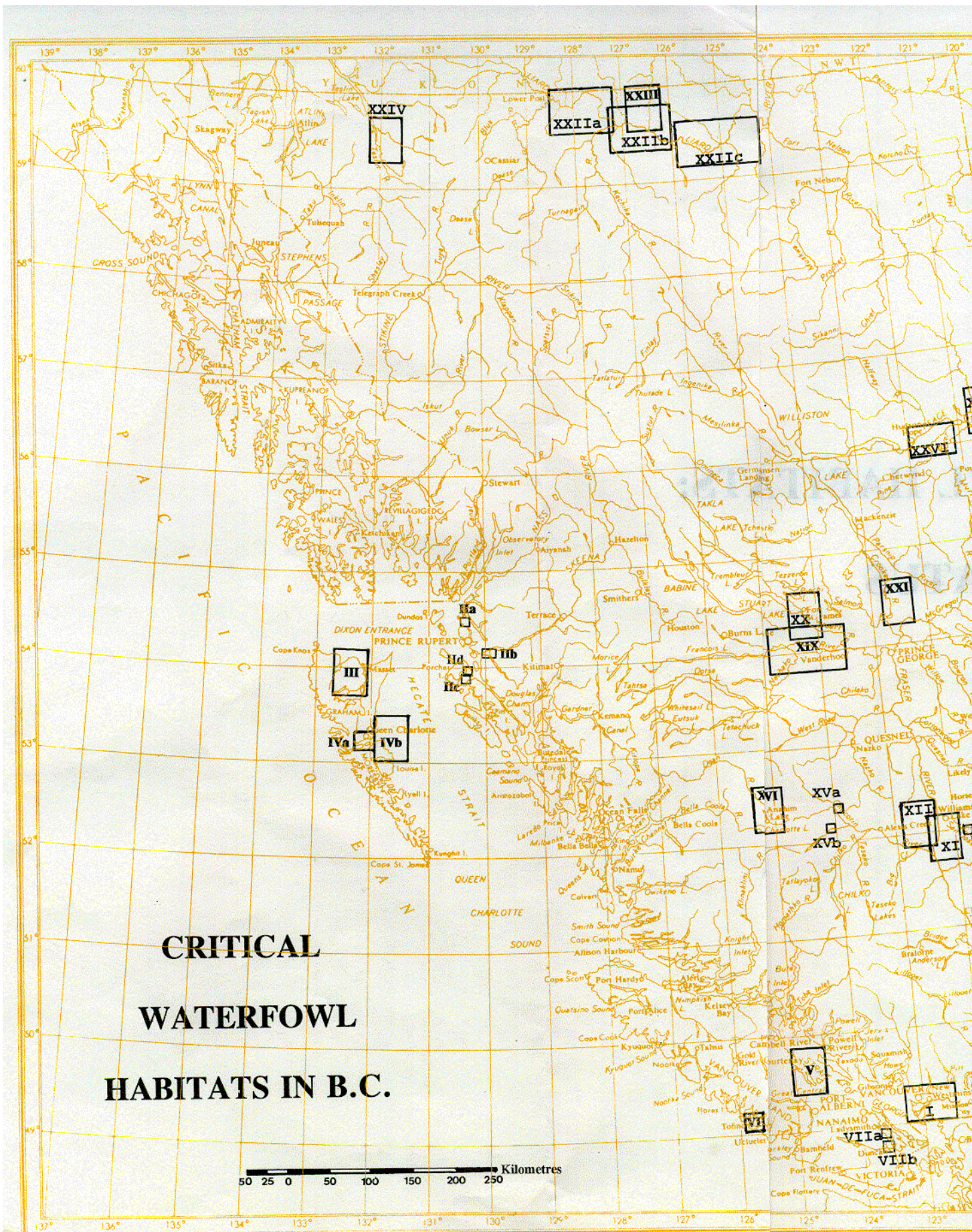
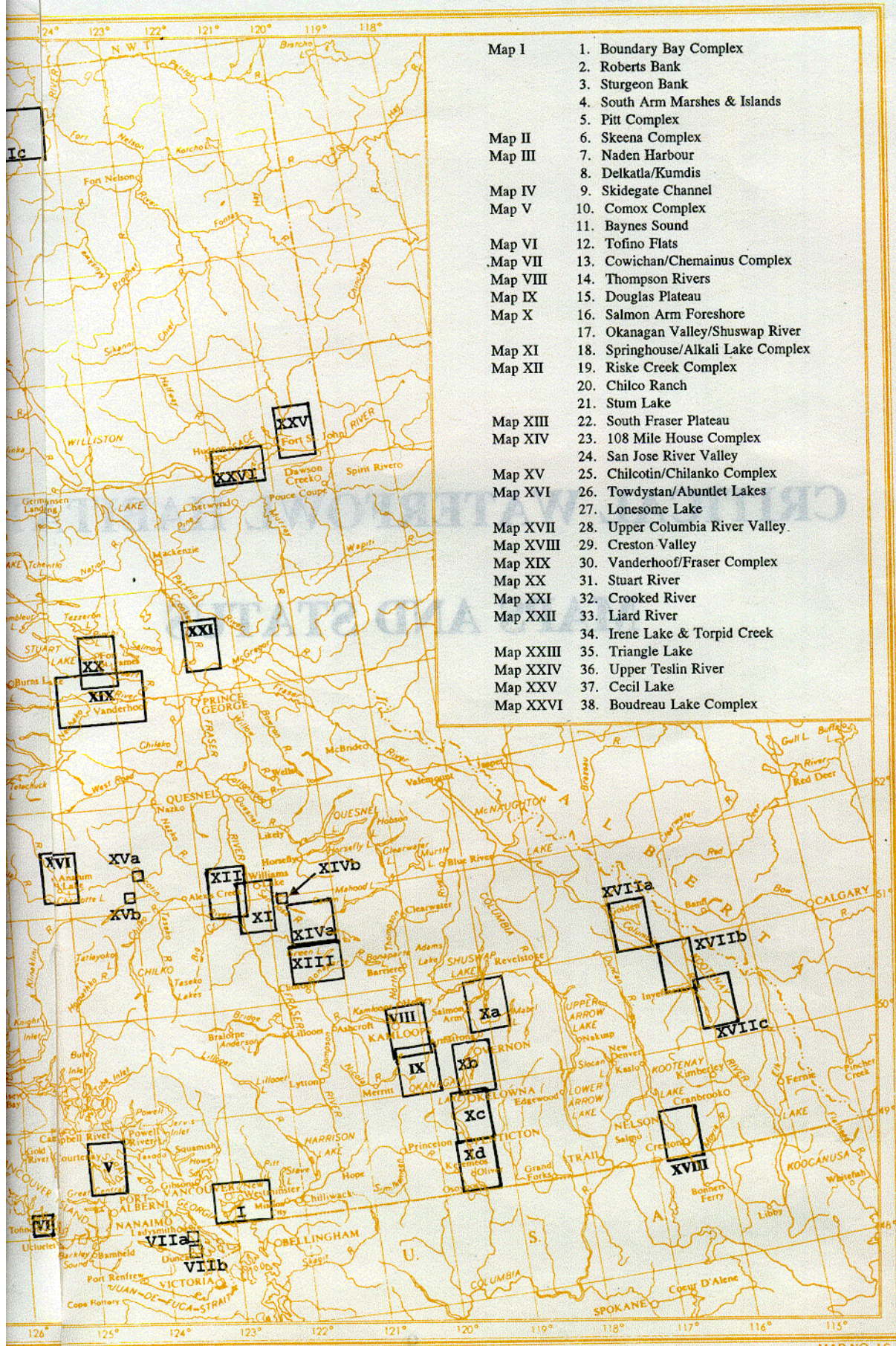


Figure 1: Index to maps of critical v



1: Index to maps of critical waterfowl habitats in B.C.

UNIT 1: COAST

FRASER DELTA

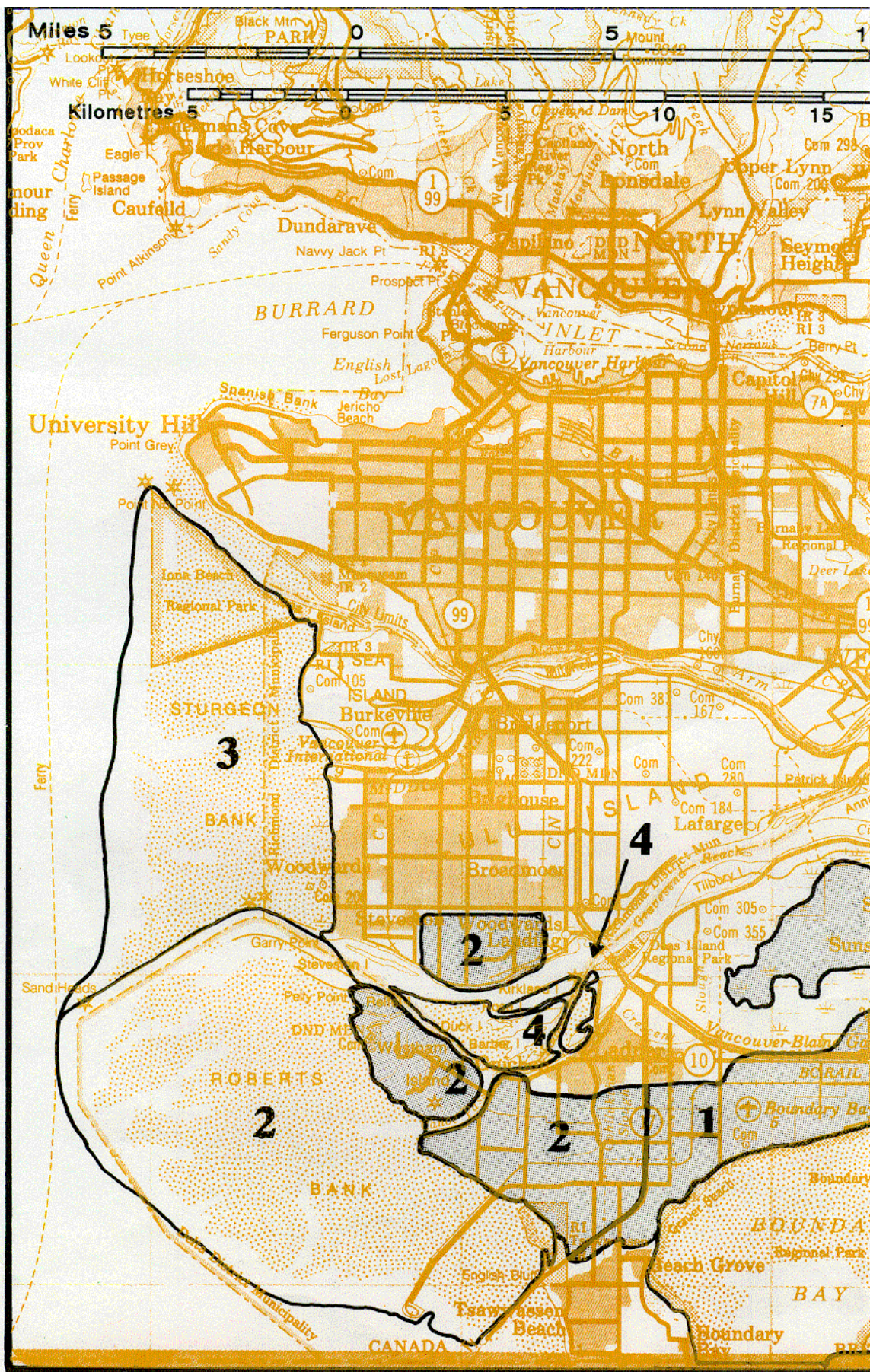
Map I Boundary Bay

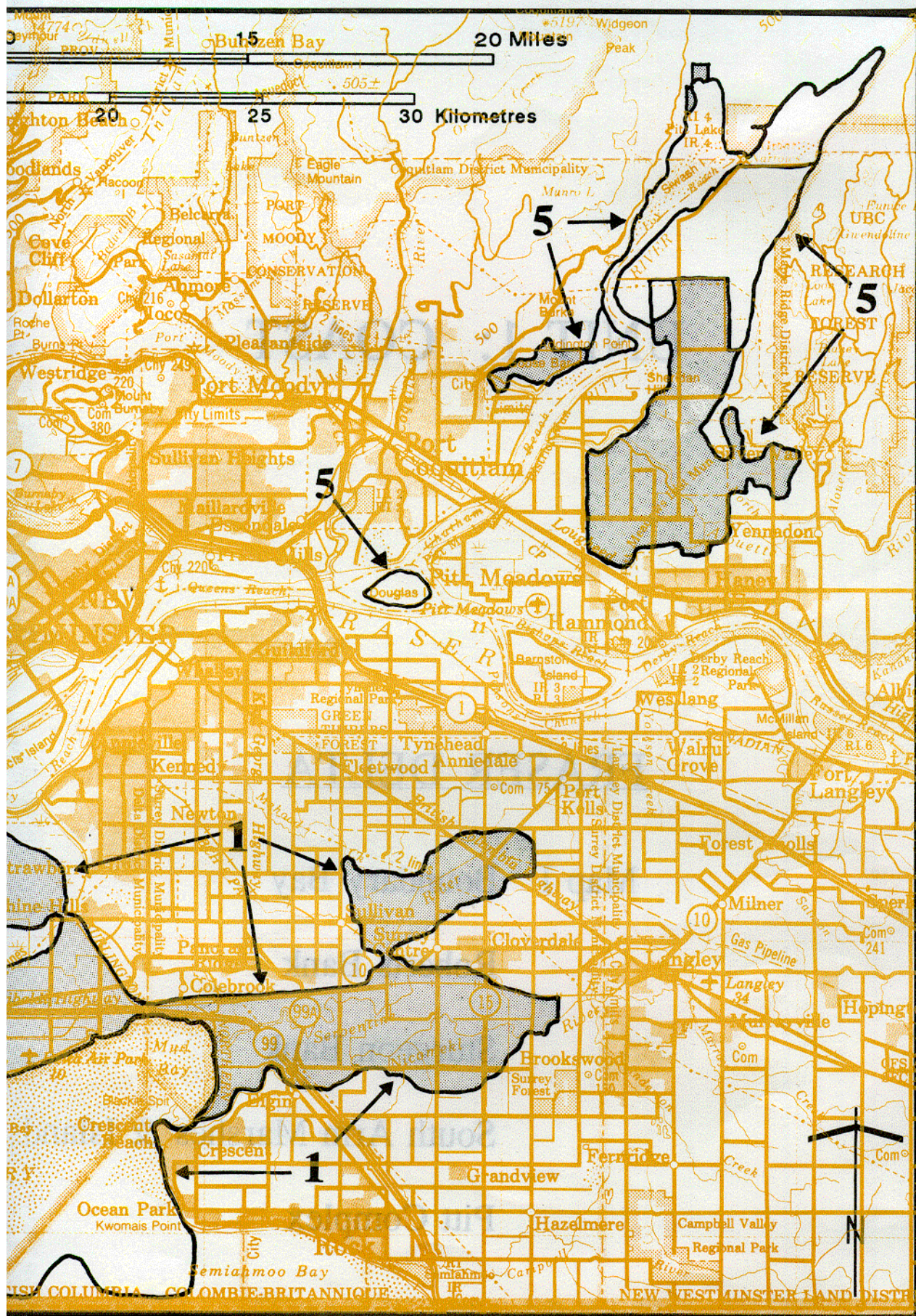
Roberts Bank

Sturgeon Bank

South Arm Marshes & Islands

Pitt Complex





Map I:

- | | |
|------------------|----------------------------------|
| 1. Boundary Bay | 4. South Arm Marshes and Islands |
| 2. Roberts Bank | 5. Pitt Complex |
| 3. Sturgeon Bank | |

1. Boundary Bay Complex

Wetland area includes Mud Bay and intertidal wetlands up to the dyke. Uplands include upper Serpentine valley, lower Serpentine-Nicomekl valley, excavated portions of Burns Bog, and farmland continuous with Boundary Bay and Mud Bay.

Use: wintering and migrating

NTS No. 92 G/2, G/3

Status and size of critical habitat within Boundary Bay Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	144	0	144	- MOELP/CWS property
Private	25	59	84	- TNT
Other	0	0	0	
Total	169	59	228	
Unprotected:				
Crown	9572	0	9572	- reserves for wildlife
Private	0	10300	10300	- 31 ha outside dyke
Other	0	0	0	
Total	9572	10300	19872	
TOTAL:	9741	10359	20100	

¹ see Appendix A for more information on classification

(Information current as of July 1993)

2. Roberts Bank

Intertidal wetlands up to dyke and adjacent uplands to Highway 17.

Use: wintering and migrating

NTS No. 92 G/3

Status and size of critical habitat within Roberts Bank

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- Alaksen NWA (Federal)
Crown	0	276	276	
Private	0	0	0	
Other	0	0	0	
Total	0	276	276	
Unprotected:				- reserves for wildlife - 158 ha Federal superport jetty
Crown	11346	0	11346	
Private	158	4384	4542	
Other	0	0	0	
Total	11504	4384	15888	
TOTAL:	11504	4660	16164	

¹ see Appendix A for information on classification

(Information current as of July 1993)

3. Sturgeon Bank

Intertidal wetland up to dyke. Uplands of Iona Island (not shown on map).

Use: wintering and migrating

NTS No: 92 G/3

Status and size of critical habitat within Sturgeon Bank

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- MOELP property
Crown	127	0	127	
Private	0	0	0	
Other	0	0	0	
Total	127	0	127	
Unprotected:				- Wetland OIC 908: Upland, GVRD - IR 3
Crown	7332	270	7602	
Private	74	39	113	
Other	0	24	24	
Total	7406	333	7739	
TOTAL:	7533	333	7866	

¹ see Appendix A for more information on classification

4. South Arm Marshes and Islands

Ladner Marsh and adjacent islands in Fraser River.

Use: wintering and migrating

NTS No: 92 G/3

Status and size of critical habitat within South Arm Marshes and Islands

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- TNT, Kirkland Island and Rose Island
Crown	698	0	698	
Private	0	112	112	
Other	0	0	0	
Total	698	112	810	
Unprotected:				- Gunn Island and Williamson Island
Crown	0	0	0	
Private	2	28	30	
Other	0	0	0	
Total	2	28	30	
TOTAL:	700	140	840	

¹ see Appendix A for more information on classification

(Information current as of July 1993)

5. Pitt Complex

Pitt River to Pitt Lake, Addington Point, Widgeon Slough, Pitt Marsh, and Douglas Island.
Uplands include adjacent farmland.

Use: breeding, wintering and migrating

NTS No. 92 G/2, G/7

Status and size of critical habitat within Pitt Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				<ul style="list-style-type: none"> - WMA (wetland): Ecological Reserve (upland) - TNT, Addington Point, GVRD
Crown	2805	75	2880	
Private	526	266	792	
Other	0	0	0	
Total	3331	341	3672	
Unprotected:				
Crown	0	0	0	
Private	400	3999	4399	
Other	0	0	0	
Total	400	3999	4399	
TOTAL:	3731	4340	8071	

¹ see Appendix A for more information on classification

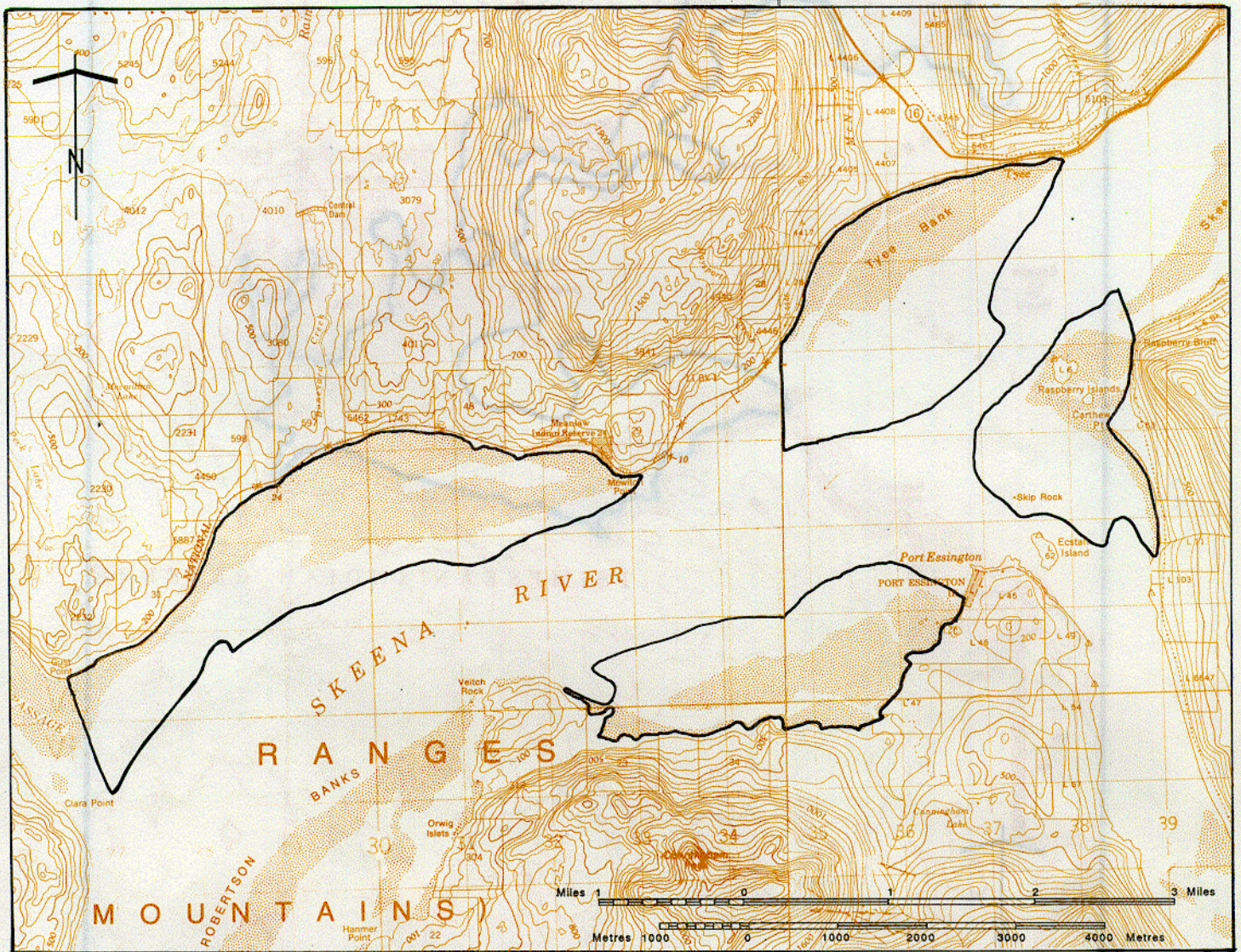
(Information current as of July 1993)

NORTH COAST

Map II Skeena Complex



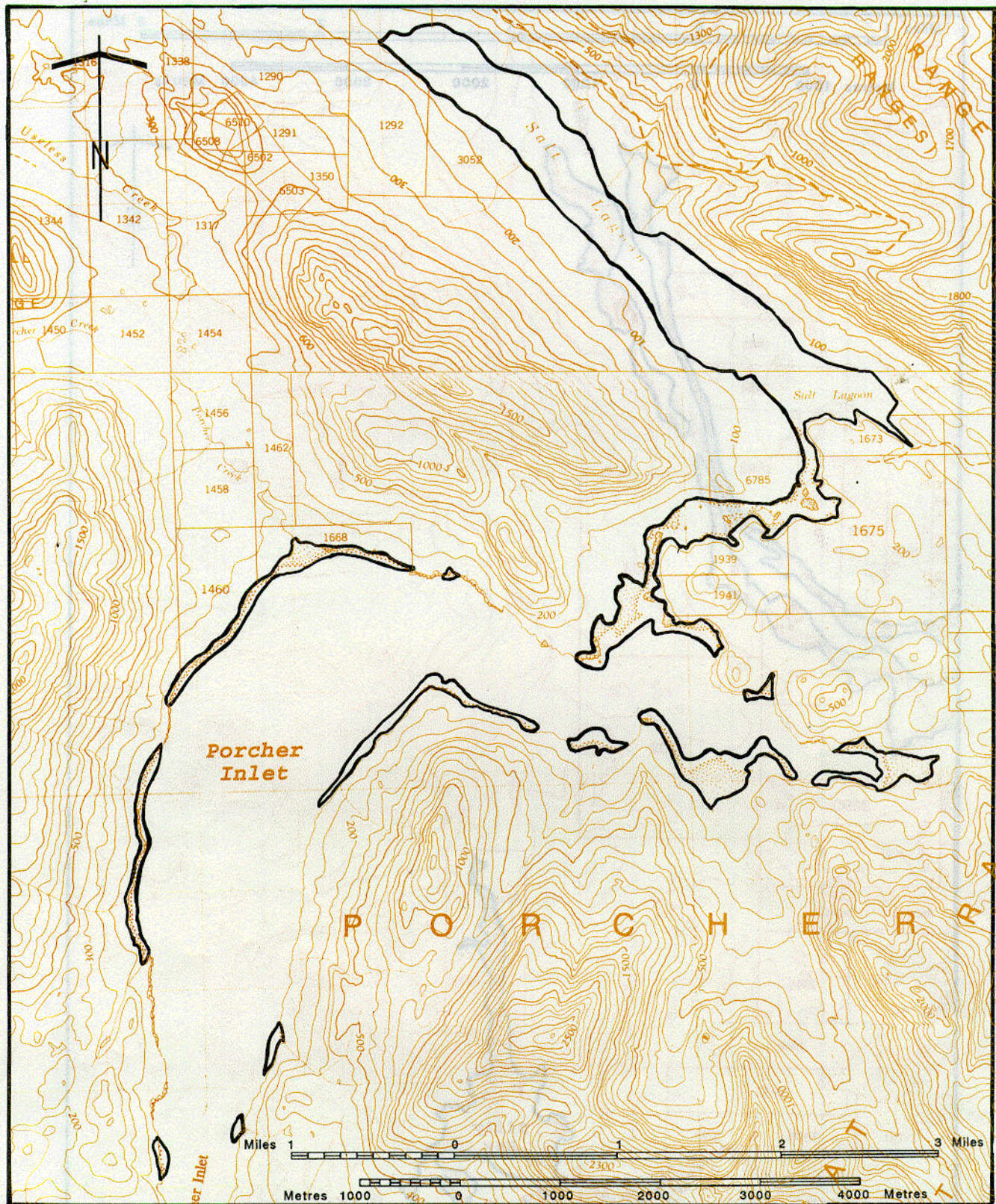
Map IIa: 6. Skeena Complex



Map IIb: 6. Skeena Complex



Map IIc: 6. Skeena Complex



Map IId: 6. Skeena Complex

6. Skeena Complex

Includes Big Bay, Moore Cove, Porcher Island, and Skeena wetlands below Ecstall.

Use: wintering and migrating

NTS No. 103 G/16, I/4, J/1, J/8

Status and size of critical habitat within Skeena Complex

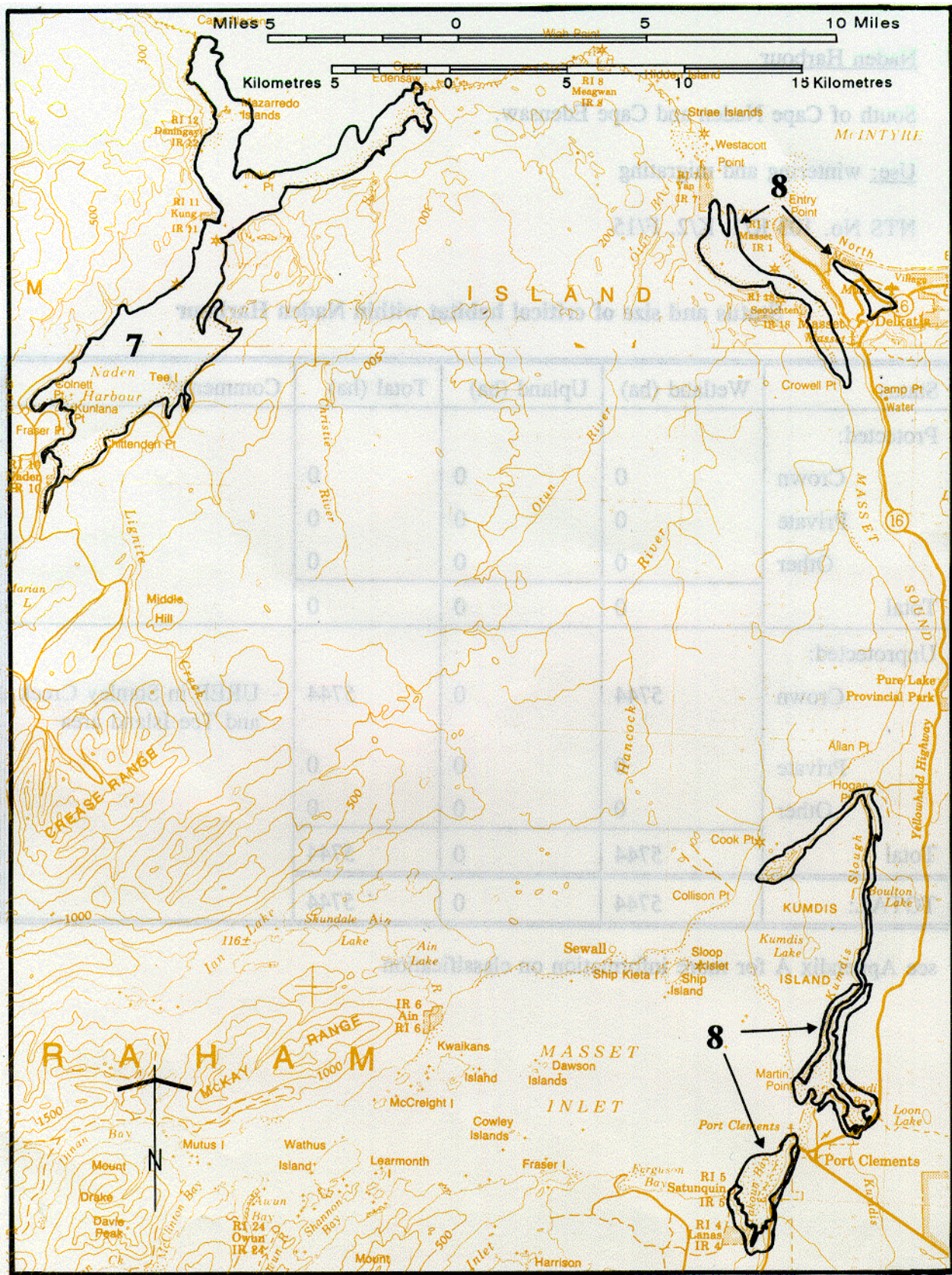
Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				
Crown	4125	0	4125	
Private	0	0	0	
Other	0	0	0	
Total	4125	0	4125	
TOTAL:	4125	0	4125	

QUEEN CHARLOTTE ISLANDS

Map III Naden Harbour

Delkatla/Kumdis

Map IV Skidegate Channel



Map III: 7. Naden Harbour

8. Delkatla/Kumdis

7. Naden Harbour

South of Cape Naden and Cape Edensaw.

Use: wintering and migrating

NTS No. 103 K/1, K/2, F/15

Status and size of critical habitat within Naden Harbour

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				- UREP in Stanley Creek and Tee Island area
Crown	5744	0	5744	
Private	0	0	0	
Other	0	0	0	
Total	5744	0	5744	
TOTAL:	5744	0	5744	

¹ see Appendix A for more information on classification

8. Delkatla/Kumdis

Masset Inlet from and including Delkatla Slough, Kumdis, and Yakoun estuaries.

Use: wintering and migrating

NTS No. 103 F/9, F/16, K/1

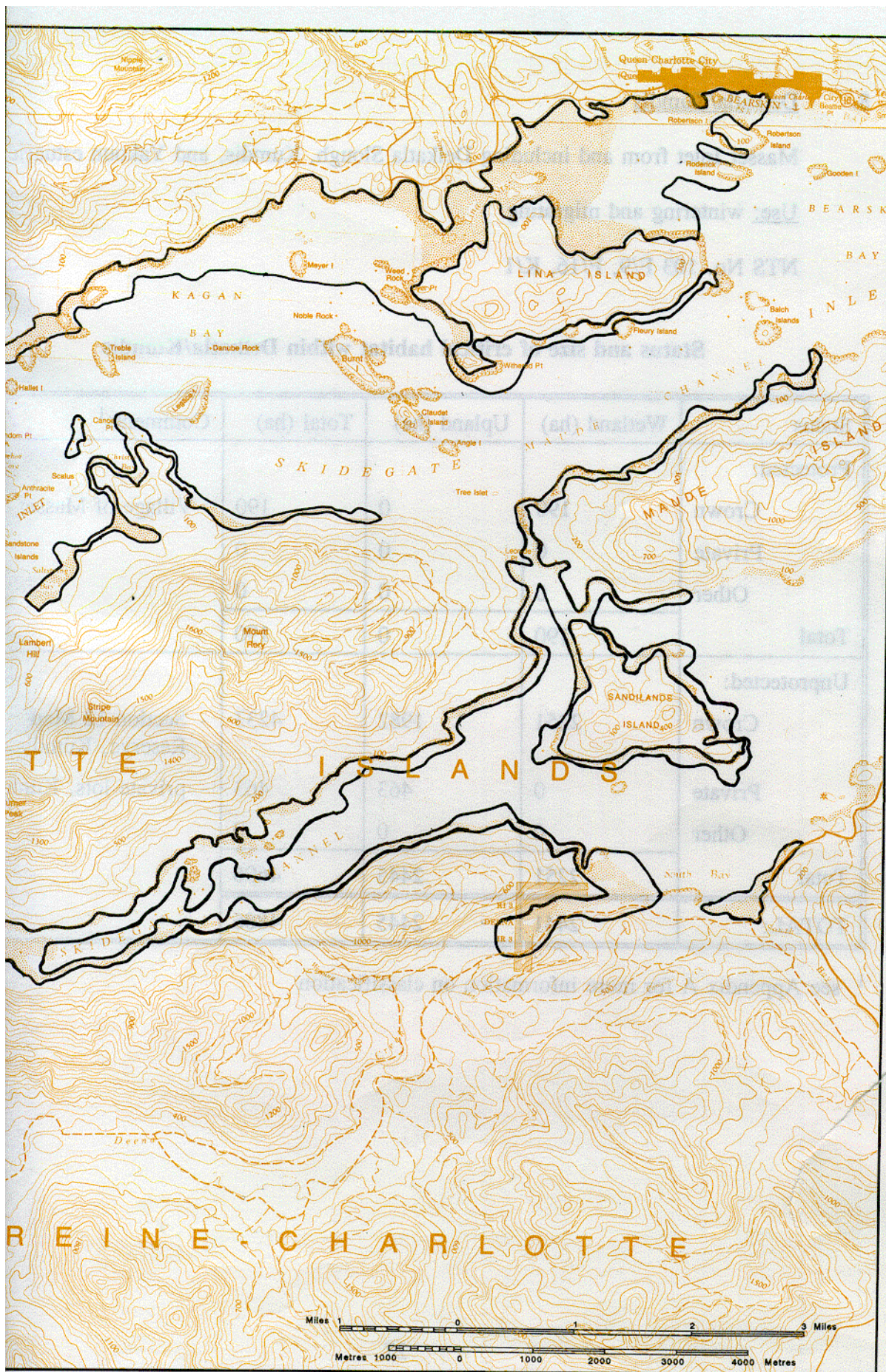
Status and size of critical habitat within Delkatla/Kumdis

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- Village of Masset
Crown	190	0	190	
Private	0	0	0	
Other	0	0	0	
Total	190	0	190	
Unprotected:				- Section 12 Map Reserve, Kumdis - private lots, Kumdis
Crown	2251	1982	4233	
Private	0	463	463	
Other	0	0	0	
Total	2251	2445	4696	
TOTAL:	2441	2445	4886	

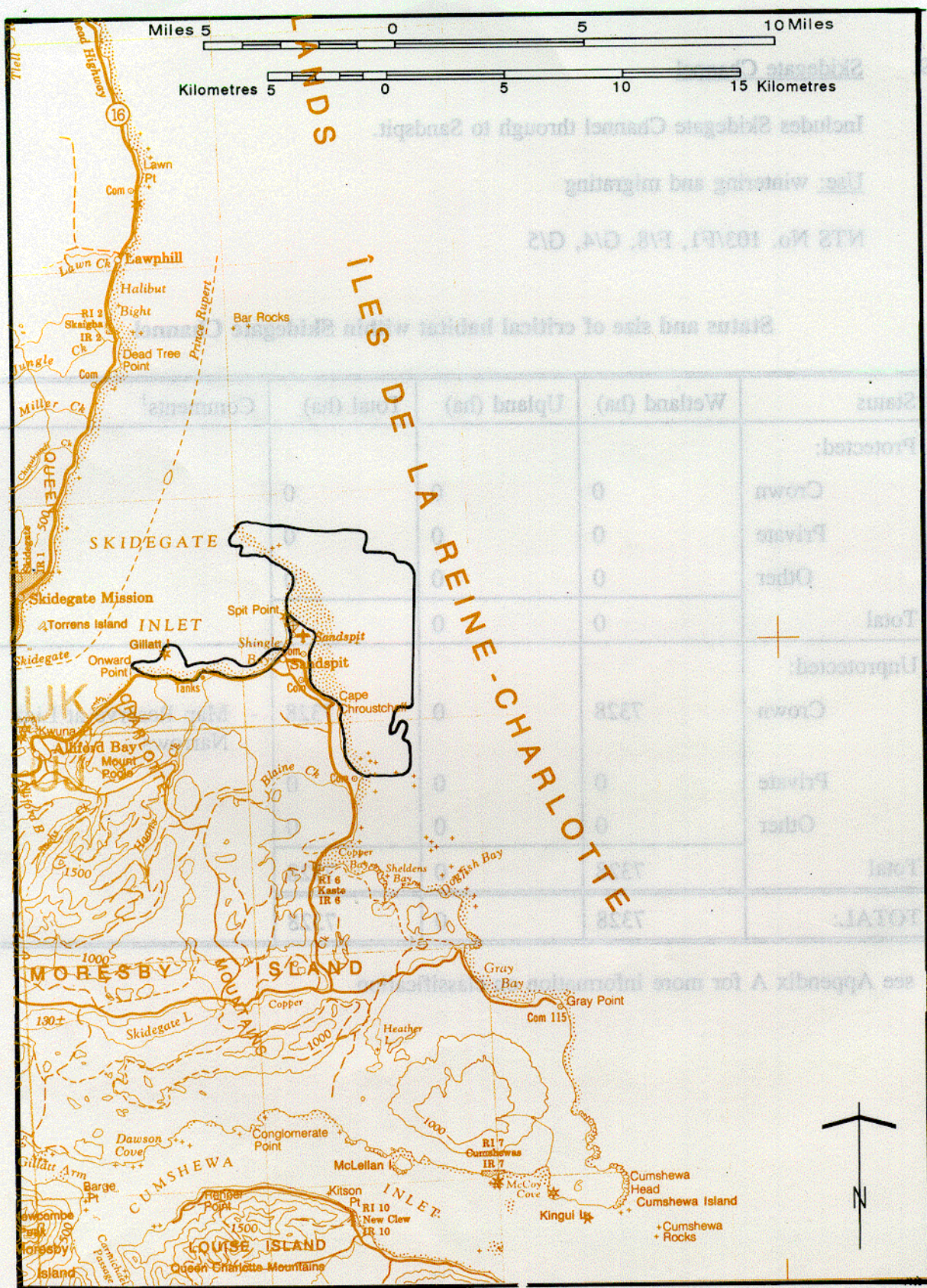
¹ see Appendix A for more information on classification



Map I



Va: 9. Skidegate Channel



Map IVb: 9. Skidegate Channel

9. Skidegate Channel

Includes Skidegate Channel through to Sandspit.

Use: wintering and migrating

NTS No. 103/F1, F/8, G/4, G/5

Status and size of critical habitat within Skidegate Channel

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				- Map Reserve at Lina Narrows
Crown	7328	0	7328	
Private	0	0	0	
Other	0	0	0	
Total	7328	0	7328	
TOTAL:	7328	0	7328	

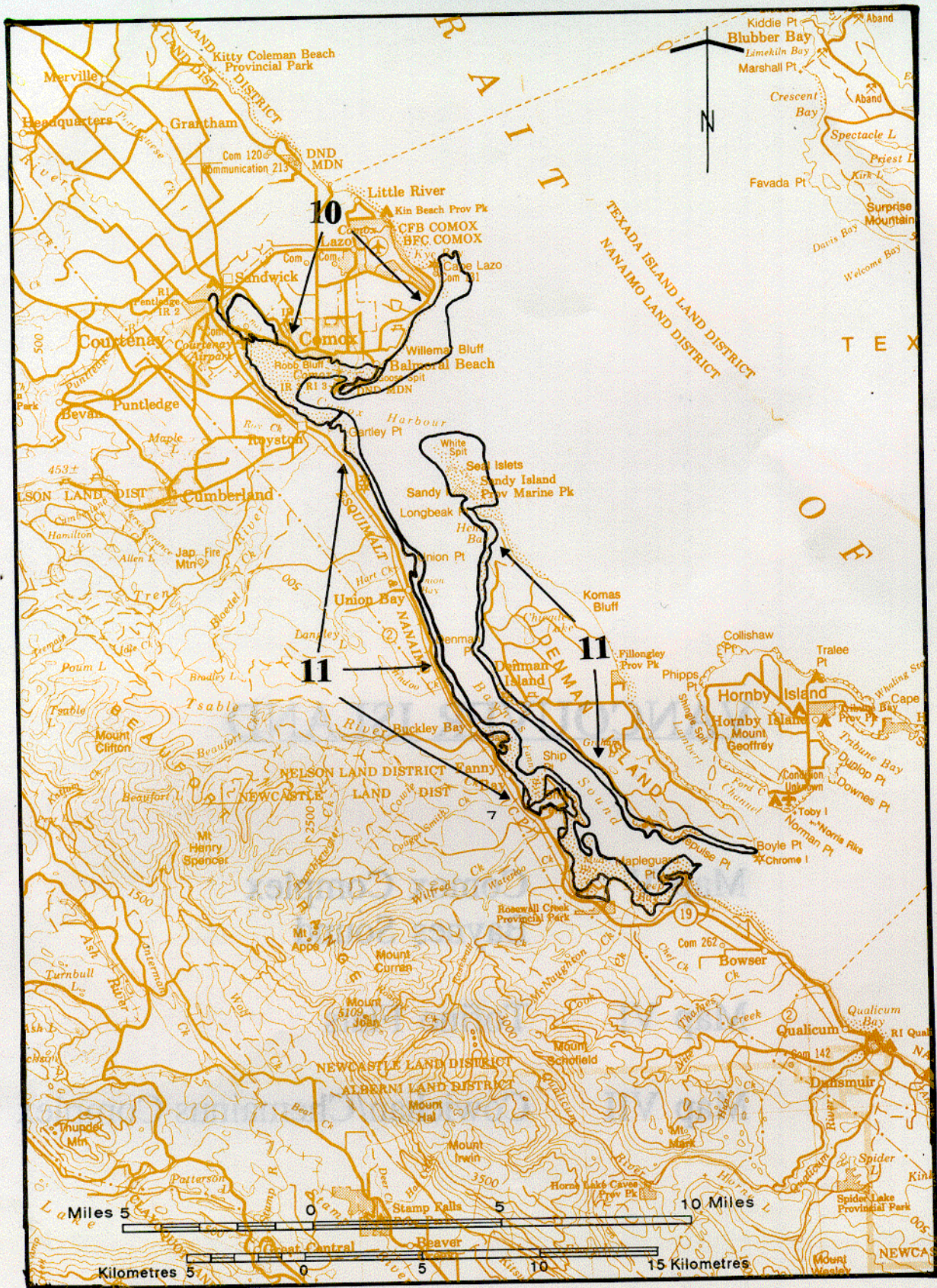
¹ see Appendix A for more information on classification

VANCOUVER ISLAND

Map V Comox Complex
 Baynes Sound

Map VI Tofino Flats

Map VII Cowichan/Chemainus Complex



Map V: 10. Comox Complex 11. Baynes Sound

10. Comox Complex

Wetlands include Cape Lazo to Goose Spit, Courtenay Estuary and surrounding wetlands. Uplands include farmlands adjacent to Courtenay River, lands owned by conservation organizations, and the old Courtenay sewage lagoon.

Use: wintering and migrating

NTS No. 92 F/10

Status and size of critical habitat within Comox Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- Section 101 - TNT
Crown	13	0	13	
Private	0	35	35	
Other	0	0	0	
Total	13	35	48	
Unprotected:				
Crown	1294	0	1294	
Private	7	263	270	
Other	0	0	0	
Total	1301	263	1564	
TOTAL:	1314	298	1612	

¹ see Appendix A for more information on classification

11. Baynes Sound

Includes south tip of Denman Island to Seal Islets.

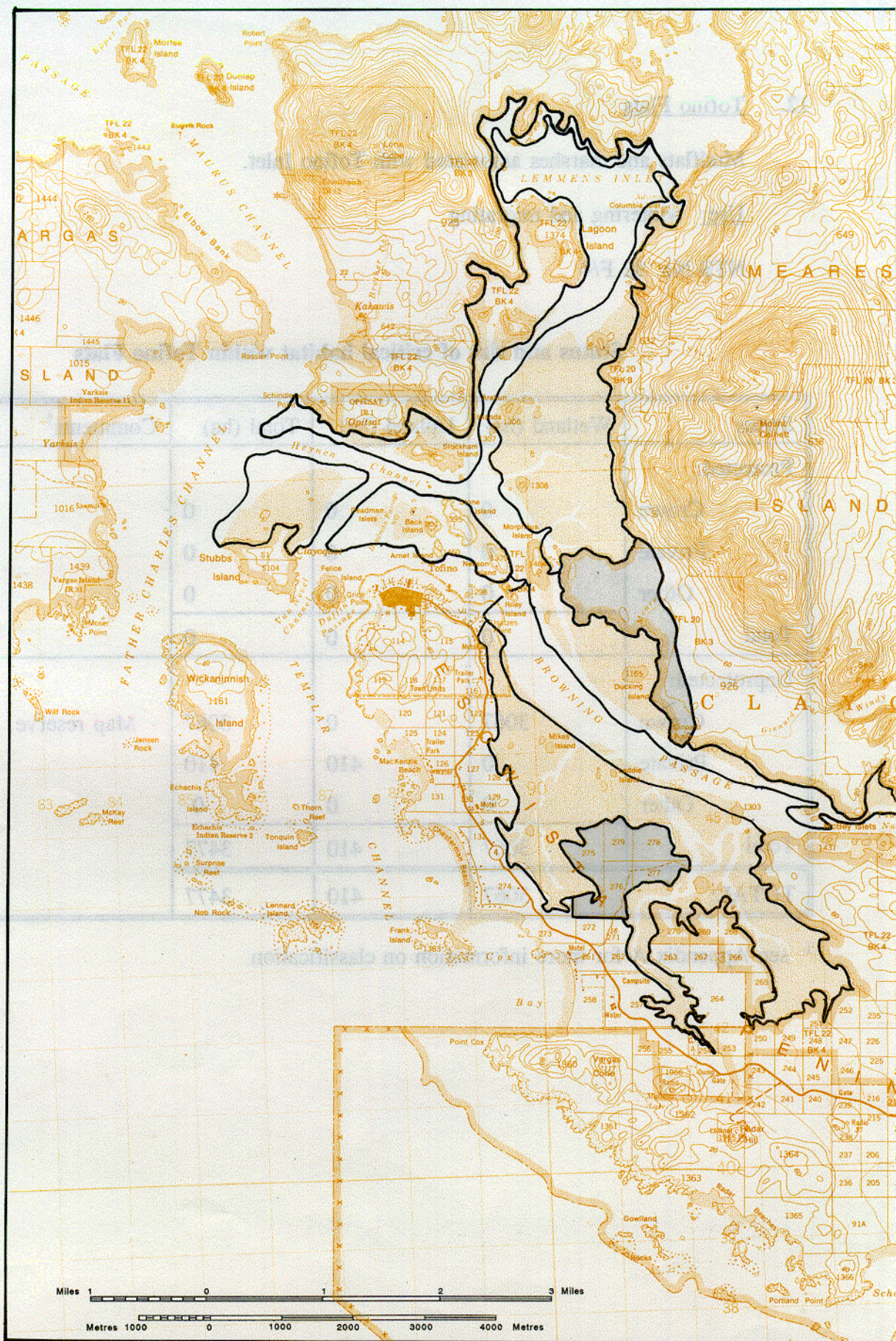
Use: wintering and migrating

NTS No. 92 F/7, F/10

Status and size of critical habitat within Baynes Sound

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				- Section 101 - TNT <i>et al.</i>
Crown	38	95	133	
Private	19	32	51	
Other	0	0	0	
Total	57	127	184	
Unprotected:				- from Pacific Estuary Conservation Program action plan
Crown	2301	0	2301	
Private	0	256	256	
Other	0	0	0	
Total	2358	383	2557	
TOTAL:	2358	383	2741	

¹ see Appendix A for more information on classification



Map VI: 12. Tofino Flats

12. Tofino Flats

Mudflats and marshes associated with Tofino Inlet.

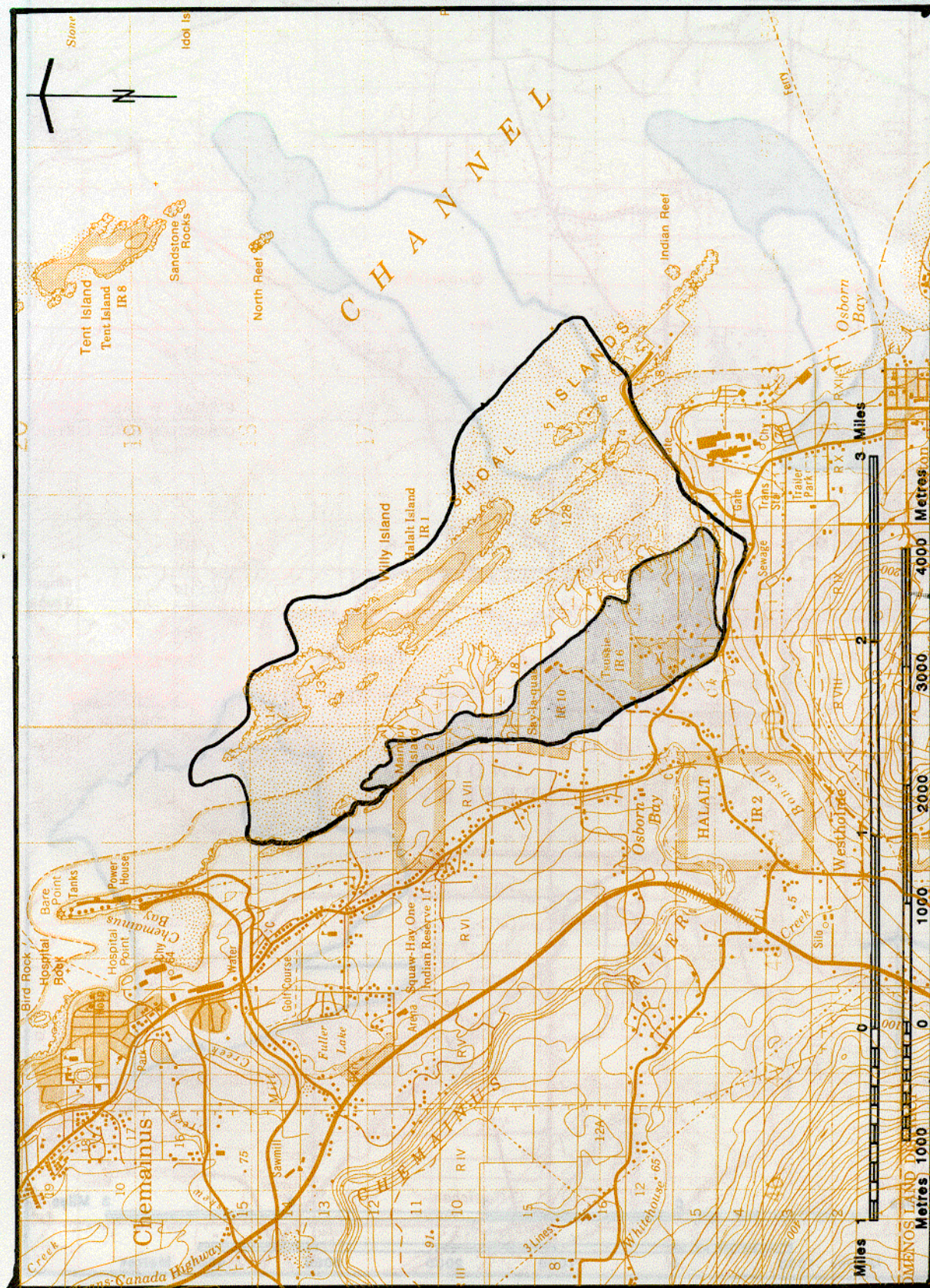
Use: wintering and migrating

NTS No. 92 F/4

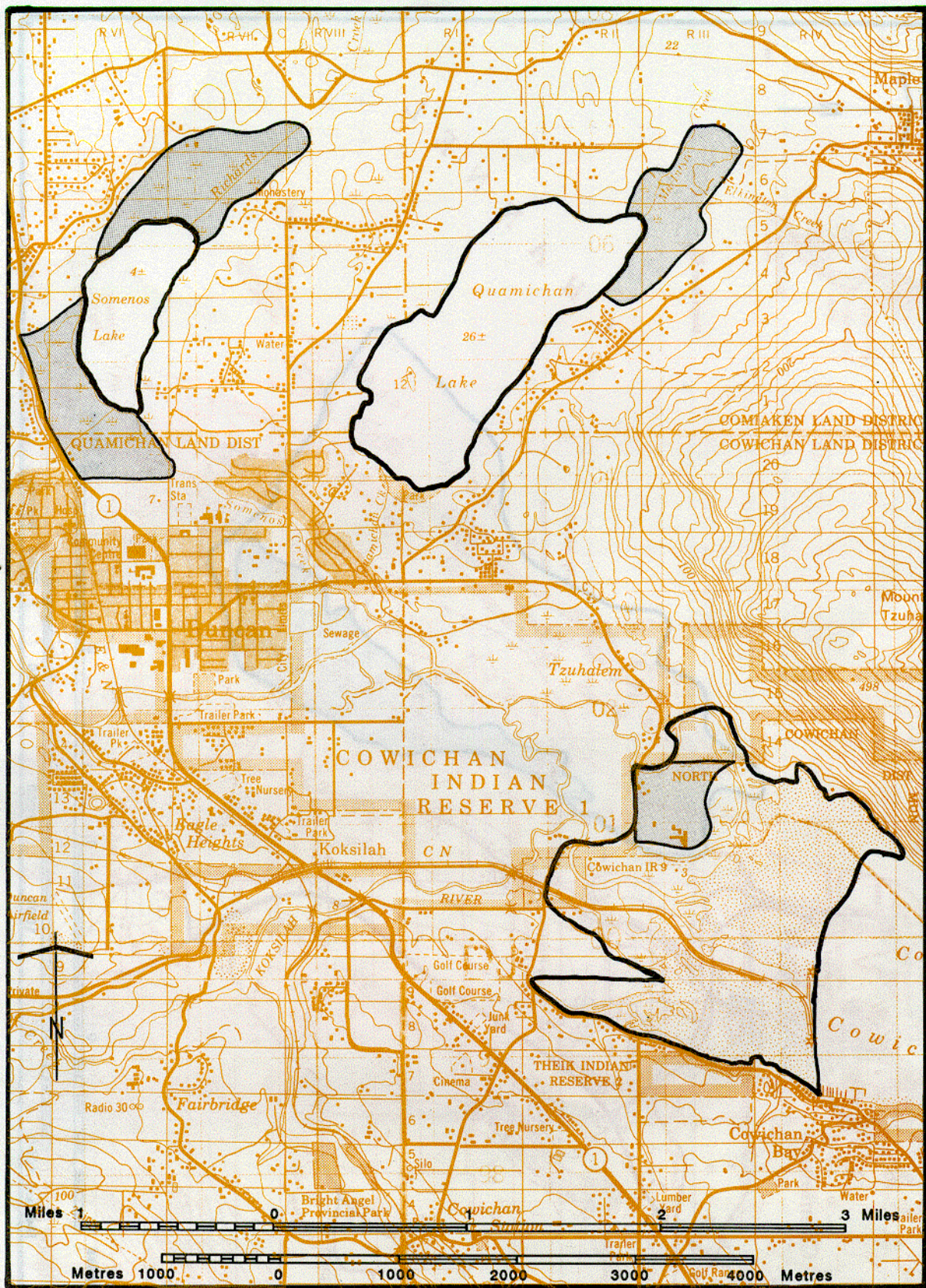
Status and size of critical habitat within Tofino Flats

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				- Map reserve, 1900 ha
Crown	3067	0	3067	
Private	0	410	410	
Other	0	0	0	
Total	3067	410	3477	
TOTAL:	3067	410	3477	

¹ see Appendix A for more information on classification



Map VIIa: 13. Cowichan/Chemainus Complex



Map VIIb: 13. Cowichan/Chemainus Complex

13. Cowichan/Chemainus Complex

Includes Cowichan and Chemainus estuaries, Somenos Lake and Quamichan Lake. Wetland portions include dyked intertidal areas and floodplain areas of Somenos Lake and Quamichan Lake.

Use: wintering and migrating

NTS No. 92 B/12, B/13

Status and size of critical habitat within Cowichan/Chemainus Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	252	0	252	- Section 101 and purchases - TNT/MOELP; Forest Museum
Private	105	0	105	
Other	0	0	0	
Total	357	0	357	
Unprotected:				
Crown	616	0	616	- most seasonal, tidal - Chemainus IR 10,6
Private	490	0	490	
Other	0	224	224	
Total	1106	224	1330	
TOTAL:	1463	224	1687	

¹ see Appendix A for more information on classification

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UNIT 2: SOUTHERN INTERIOR

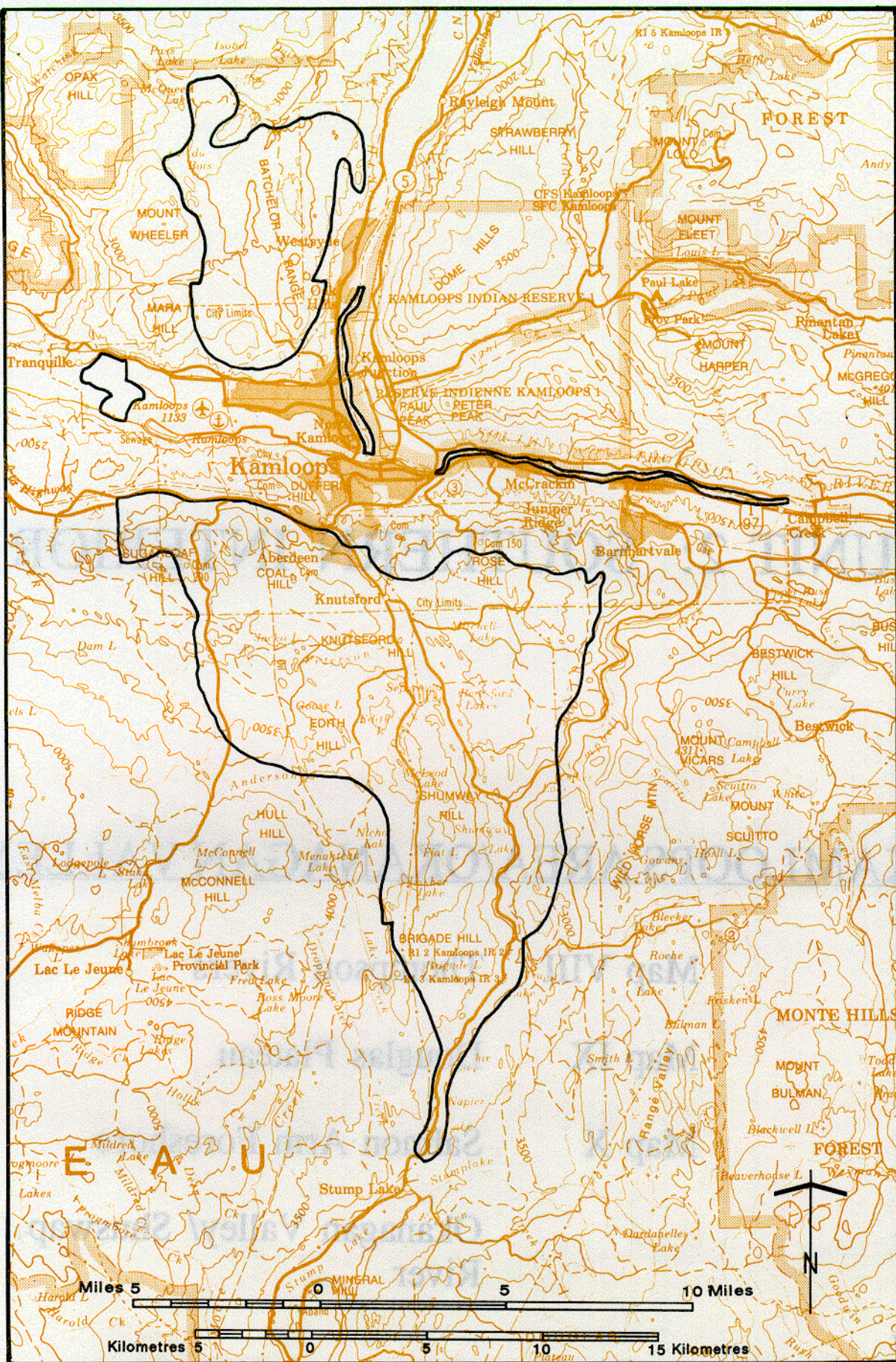
KAMLOOPS AREA/OKANAGAN VALLEY

Map VIII Thompson Rivers

Map IX Douglas Plateau

Map X Salmon Arm Foreshore

Okanagan Valley/ Shuswap
River



Map VIII: 14. Thompson Rivers

14. Thompson Rivers

Includes the Thompson River east of Kamloops Lake, junction of North and South Thompson, South Thompson to Little Shuswap Lake, and North Thompson to Westsyde; Bachelor Hills and Knutsford area south to the divide between Napier Lake and Stump Lake.

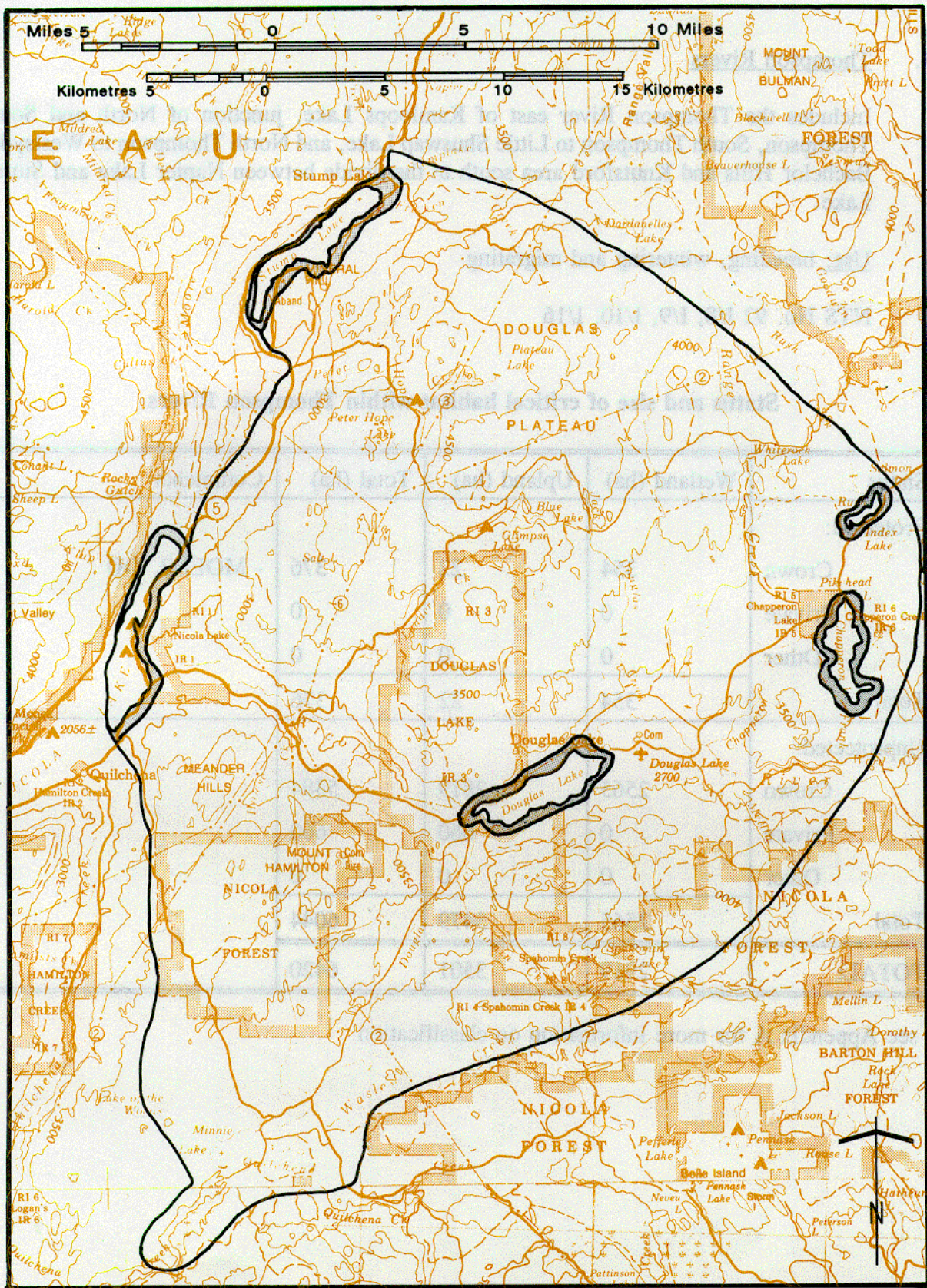
Use: breeding, wintering and migrating

NTS No. 92 I/8, I/9, I/10, I/16

Status and size of critical habitat within Thompson Rivers

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- MOELP, DU
Crown	354	22	376	
Private	0	0	0	
Other	0	0	0	
Total	354	22	376	
Unprotected:				
Crown	2565	2819	5384	
Private	0	660	660	
Other	0	0	0	
Total	2565	3479	6044	
TOTAL:	2919	3501	6420	

¹ see Appendix A for more information on classification



Map IX: 15. Douglas Plateau

15. Douglas Plateau

Includes Nicola Lake, Guichon Flats, Stump Lake, Chapperon Lake, Quilchena Creek and the wetlands under 4,000 feet within the polygon shown on the map.

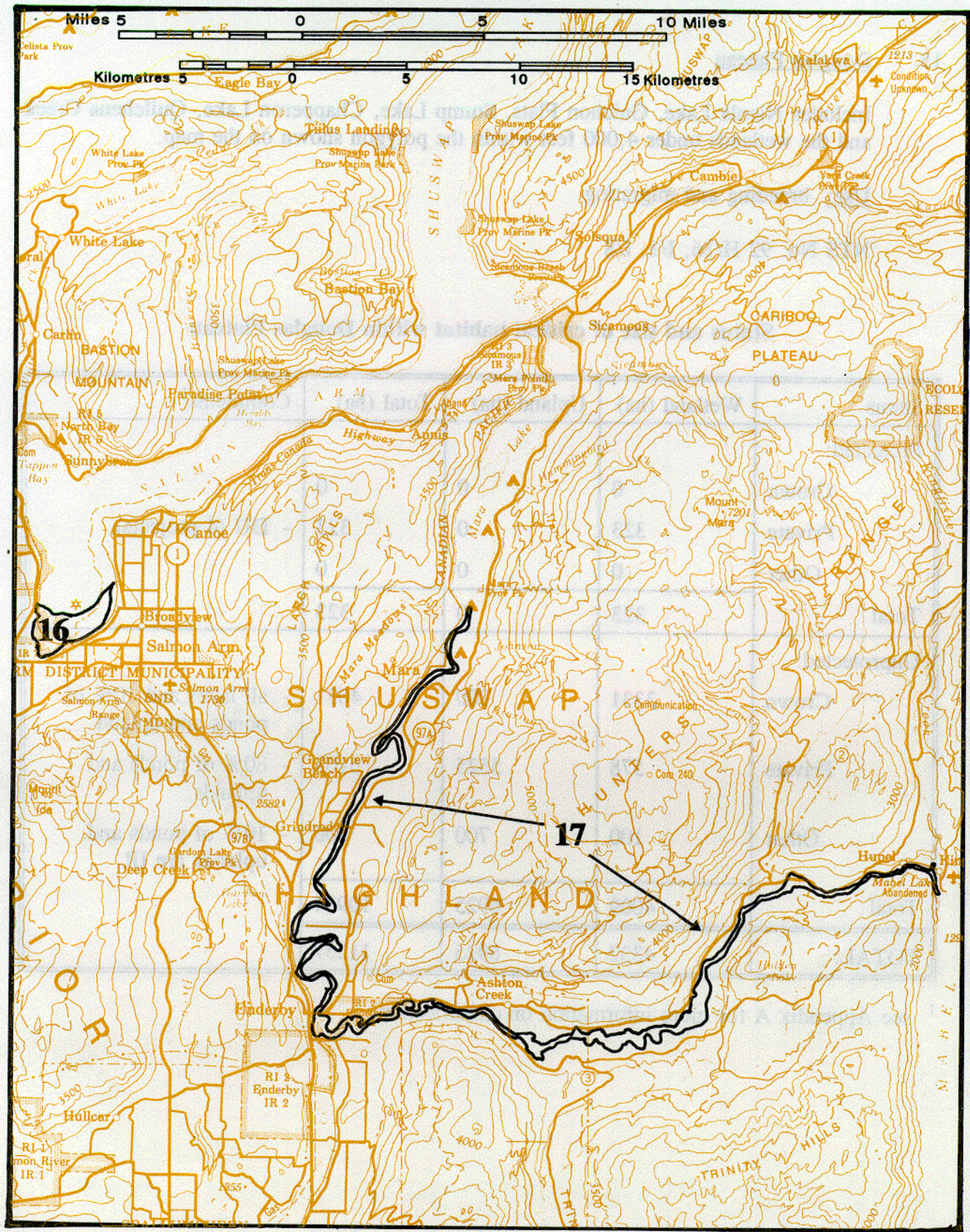
Use: breeding and migrating

NTS No. 92 H/16, I/1, I/8

Status and size of critical habitat within Douglas Plateau

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- DU (4 projects)
Crown	0	0	0	
Private	323	0	323	
Other	0	0	0	
Total	323	0	323	
Unprotected:				- all lakes and 10% of ponds and upland - 80% of ponds and uplands - 10% of ponds and uplands are IR
Crown	3331	700	4031	
Private	578	5525	6103	
Other	100	700	800	
Total	4009	6925	10934	
TOTAL:	4332	6925	11257	

¹ see Appendix A for more information on classification



Map Xa: 16. Salmon Arm Foreshore

17. Okanagan Valley/Shuswap River

16. Salmon Arm Foreshore

Includes the delta of Salmon River and northeast about three km along the shoreline from the public wharf; also includes the low-water mudflats.

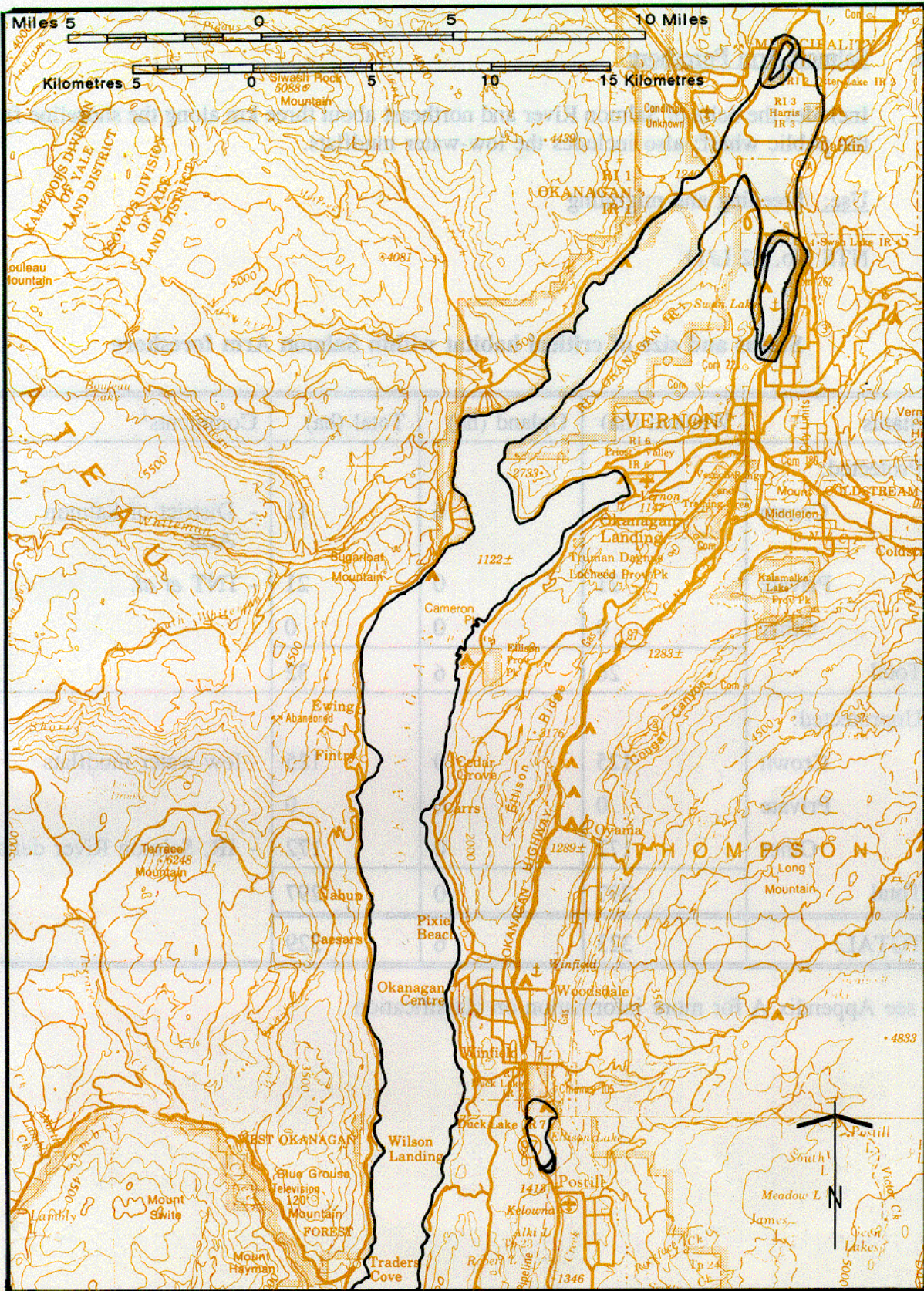
Use: breeding and migrating

NTS No. 82 L/11

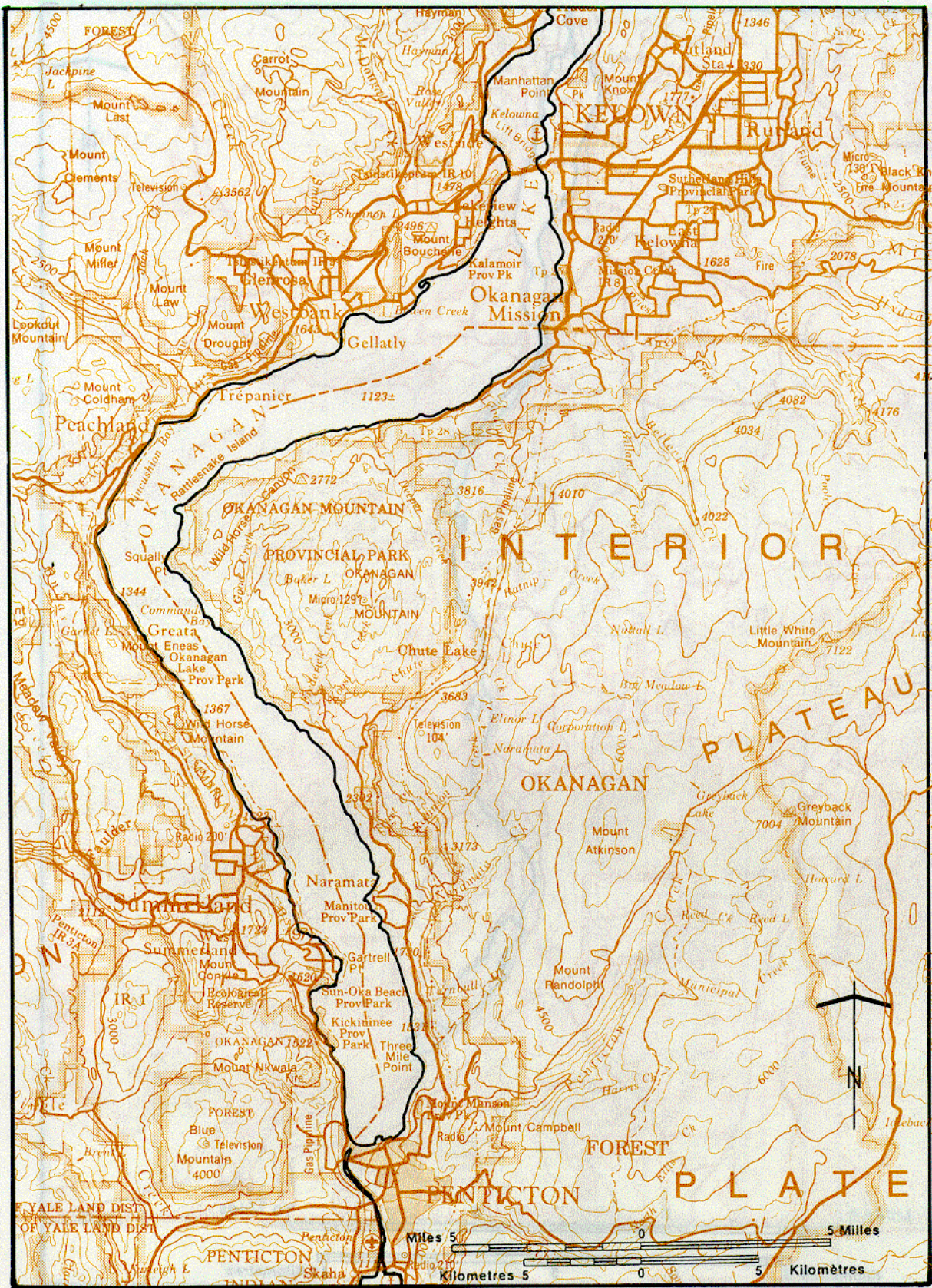
Status and size of critical habitat within Salmon Arm foreshore

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- District of Salmon Arm - TNT <i>et al.</i>
Crown	5	6	11	
Private	21	0	21	
Other	0	0	0	
Total	26	6	32	
Unprotected:				- low-water mudflats - IR, Salmon River delta
Crown	125	0	125	
Private	0	0	0	
Other	172	0	172	
Total	297	0	297	
TOTAL:	323	6	329	

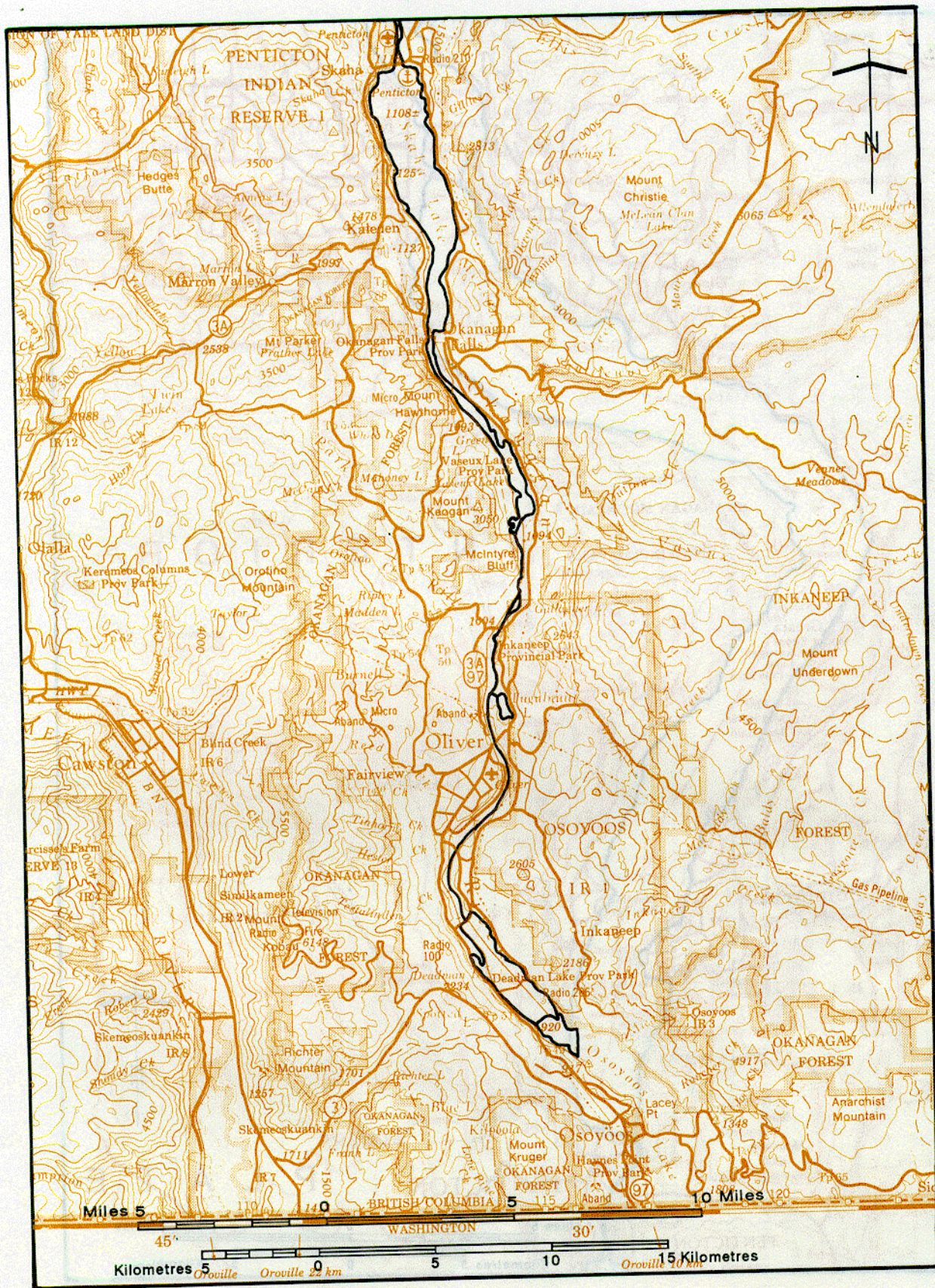
¹ see Appendix A for more information on classification



Map Xb: 17. Okanagan Valley/Shuswap River



Map Xc: 17. Okanagan Valley/Shuswap River



Map Xd: 17. Okanagan Valley/Shuswap River

17. Okanagan Valley/Shuswap River

Includes Okanagan Valley from north of Vernon to the United States border, excluding Kalamalka Lake and Woods Lake, and the Shuswap River from Mabel Lake to Mara Lake.

Use: breeding and migrating

NTS No. 82 E/4, E/5, E/12, E/13, E/14, L/3, L/4, L/6, L/10, L/11

Status and size of critical habitat within Okanagan Valley/Shuswap River

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- CWS, DU, and MOELP
Crown	819	68	887	
Private	0	0	0	
Other	0	0	0	
Total	819	68	887	
Unprotected:				- includes intermixed upland
Crown	5000	0	5000	
Private	40	570	610	
Other	0	0	0	
Total	5040	570	5610	
TOTAL:	5859	638	6497	

¹ see Appendix A for more information on classification

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CARIBOO/ CHILCOTIN

Map XI Springhouse/Alkali Lake Complex

Map XII Riske Creek Complex

Chilco Ranch

Stum Lake

Map XIII South Fraser Plateau

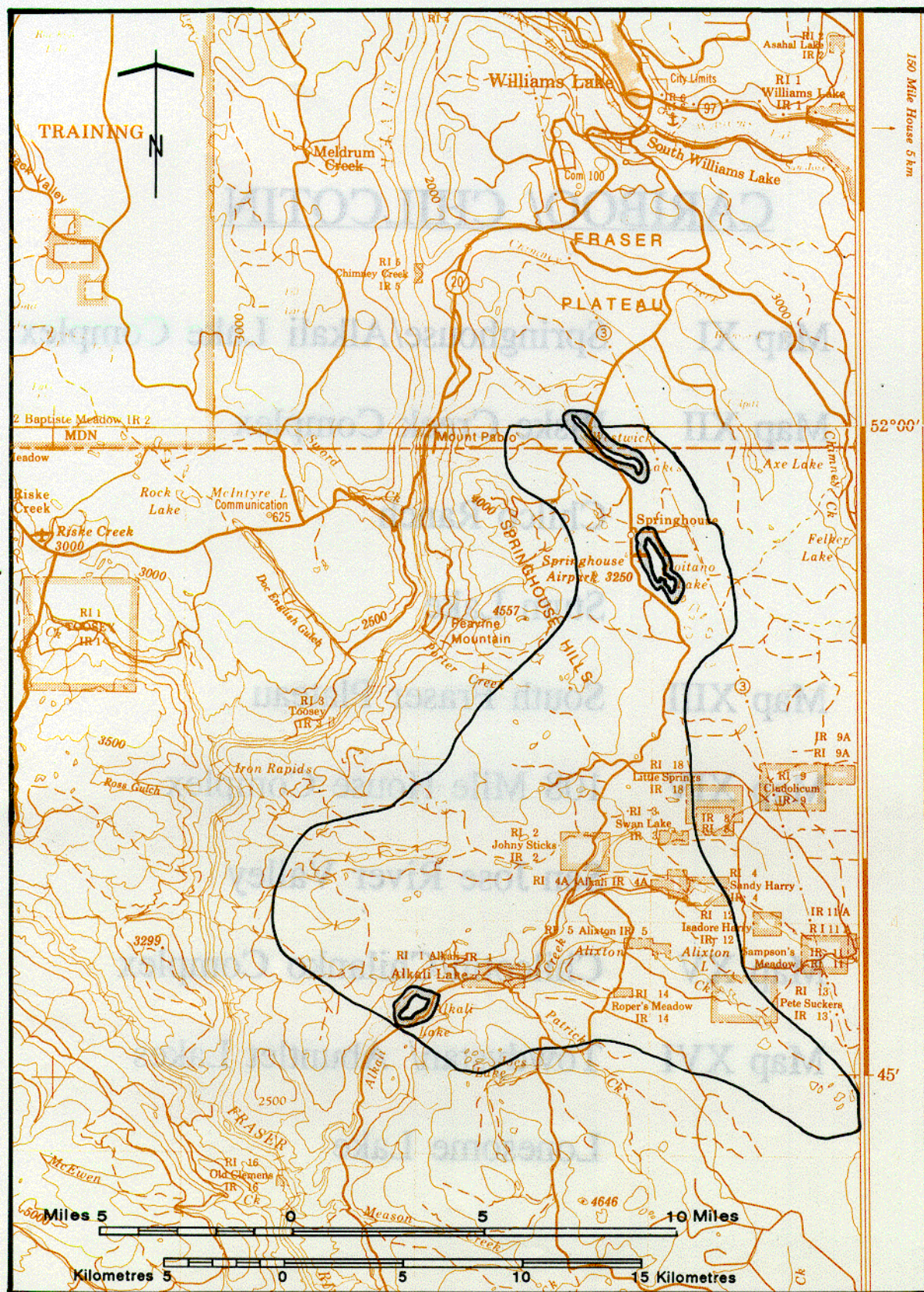
Map XIV 108 Mile House Complex

San Jose River Valley

Map XV Chilcotin/Chilanko Complex

Map XVI Towdystan/ Abuntlet Lakes

Lonesome Lake



Map XI: 18. Springhouse/Alkali Lake Complex

18. Springhouse/Alkali Lake Complex

Includes Westwick Lake to the north, Pete Sucker Lake chain to the southeast, Alkali Lake to the southwest, and to within 3-4 km of the Fraser River along the west side. Upland includes all small lakes and ponds within boundary on map.

Use: breeding and migrating

NTS No. 92 0/9, 0/16, 93 B/1

Status and size of critical habitat within Springhouse Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	153	30	183	- DU; Ecological Reserve
Private	90	0	90	- DU
Other	38	0	38	- DU
Total	281	30	311	
Unprotected:				
Crown	248	1335	1583	- some may be private
Private	285	755	1040	- includes Boitano Lake and upland
Other	92	405	497	- IR
Total	625	2495	3120	
TOTAL:	906	2525	3431	

¹ see Appendix A for more information on classification

19. Riske Creek Complex

Includes Military Reserve, Bald Mountain, and the strip of land between them.

Use: breeding and migrating

NTS No. 92 0/15, O/16, 93 B/1, B/2

Status and size of critical habitat within Riske Creek Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- DU (3 projects)
Crown	131	0	131	
Private	0	0	0	
Other	0	0	0	
Total	131	0	131	
Unprotected:				- Military Reserve: IR, 8 ha
Crown	1173	2541	3714	
Private	0	0	0	
Other	920	2475	3395	
Total	2093	5016	7109	
TOTAL:	2224	5016	7240	

¹ see Appendix A for more information on classification

20. Chilco Ranch

Includes elliptical area within black border indicated on map.

Use: breeding and migrating

NTS No. 92 O/14, O/15

Status and size of critical habitat within Chilco Ranch

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				- DU (1 project)
Crown	0	0	0	
Private	286	0	286	
Other	0	0	0	
Total	286	0	286	
Unprotected:				
Crown	0	0	0	
Private	0	858	858	
Other	0	0	0	
Total	0	858	858	
TOTAL:	286	858	1144	

21. Stum Lake

Includes area within black border surrounding upland perimeter of the lake.

Use: breeding

NTS No. 93 B/6

Status and size of critical habitat within Stum Lake

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				- Stum Lake Provincial Park
Crown	786	381	1167	
Private	0	0	0	
Other	0	0	0	
Total	786	381	1167	
Unprotected:				- IR
Crown	0	0	0	
Private	0	0	0	
Other	0	144	144	
Total	0	144	144	
TOTAL:	786	525	1311	



Map XIII: 22. South Fraser Plateau

22. South Fraser Plateau

The south end of the Fraser Plateau, bounded on the west by Big Bar Creek, Long Lake, and Wild Goose Lake; on the north by Clink Lake, then northeast to include the south end of Green Lake and all of Tin Cup Lake; on the east by the Rayfield River; and on the south side, west along latitude 51 15 then south to include Trurans Lake and northwest along road to include Little White Lake and Big Bar Lake.

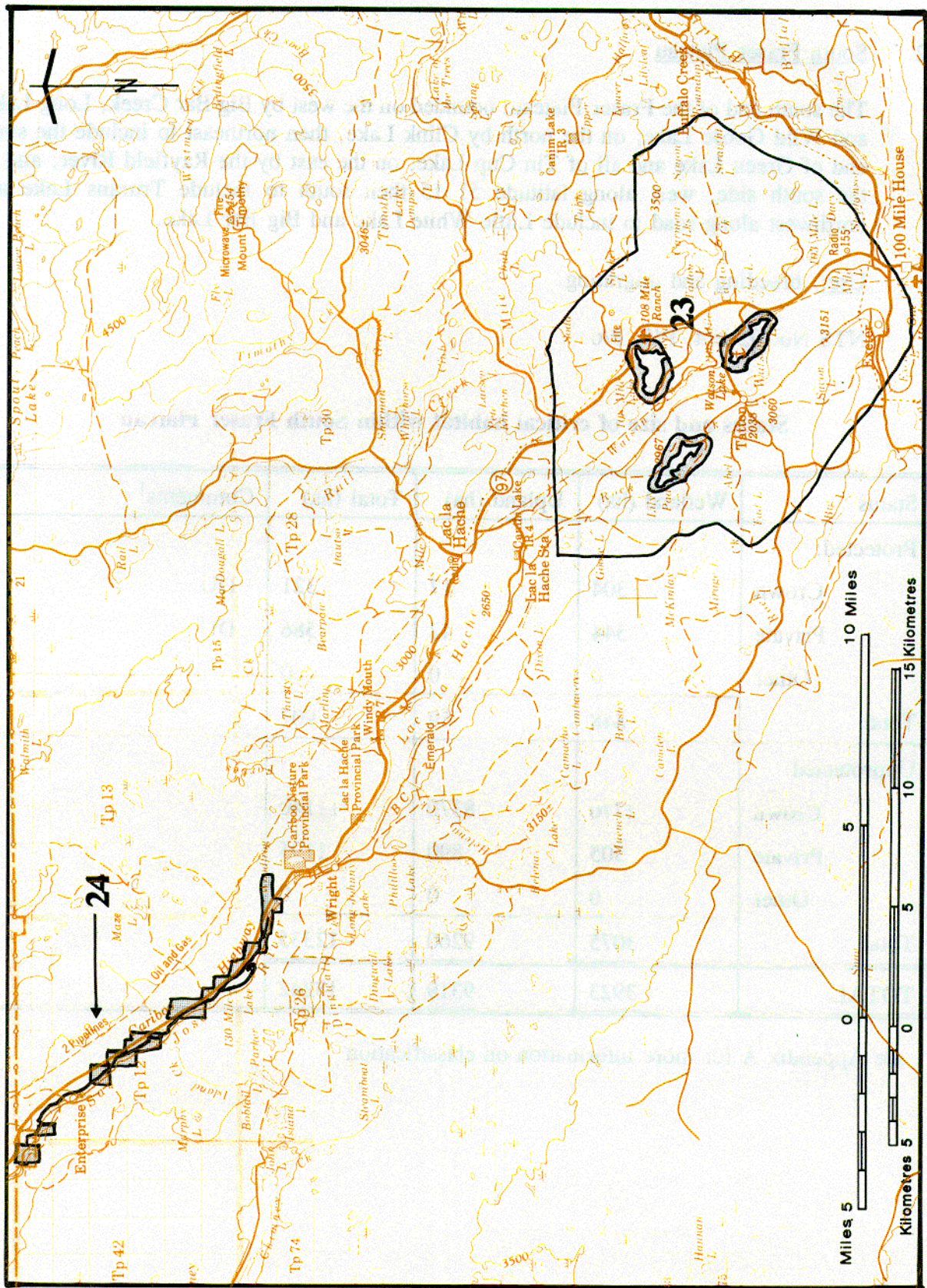
Use: breeding and migrating

NTS No. 92 P/4, P/5, P/6

Status and size of critical habitat within South Fraser Plateau

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	304	17	321	- DU
Private	544	42	586	- DU
Other	0	0	0	
Total	848	59	907	
Unprotected:				
Crown	2770	8370	11140	
Private	305	890	1195	
Other	0	0	0	
Total	3075	9260	12335	
TOTAL:	3923	9319	13242	

¹ see Appendix A for more information on classification



Map XIVa: 23. 108 Mile House Complex

24. San Jose River Valley

23. 108 Mile House Complex

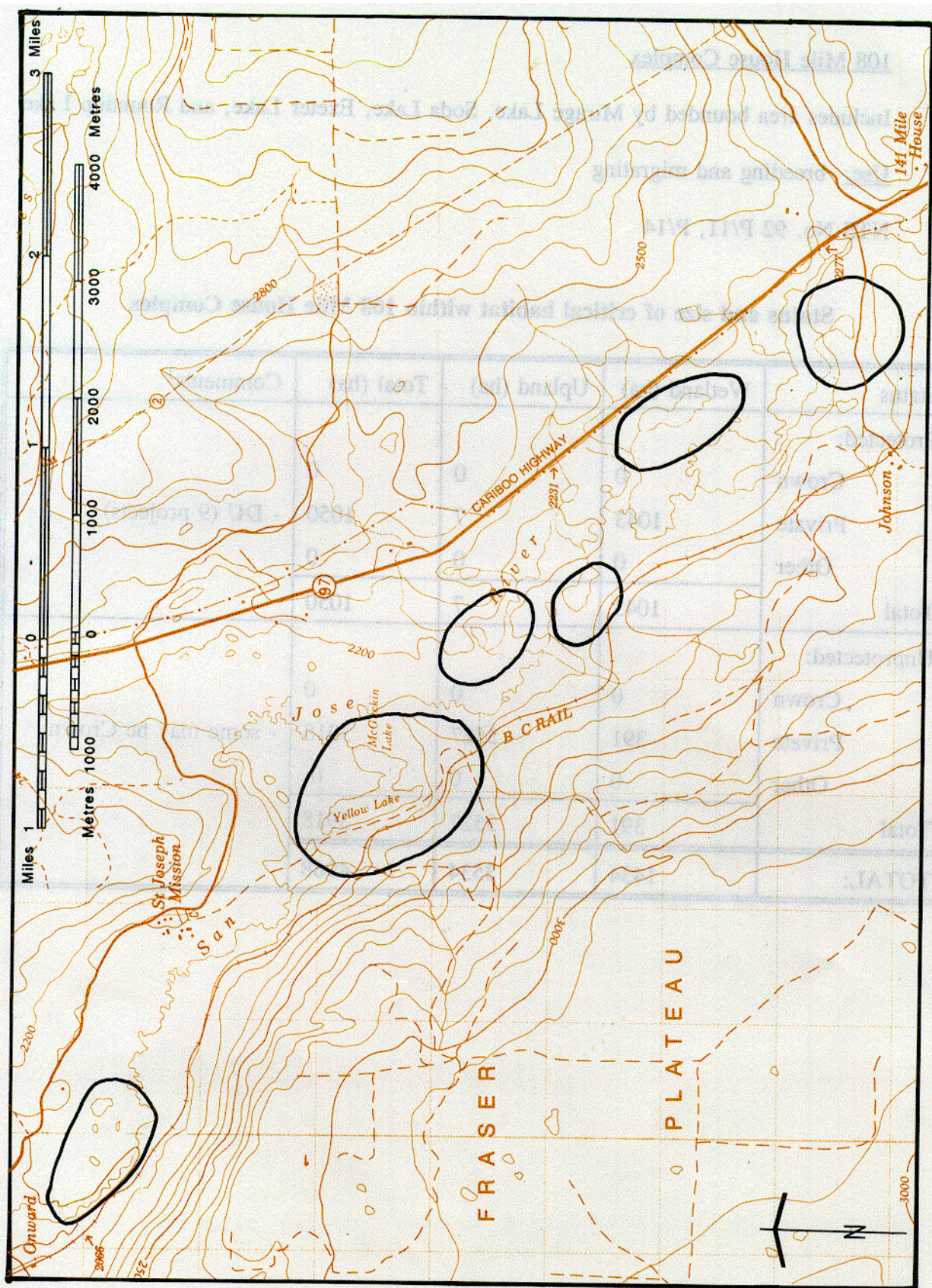
Includes area bounded by Mirage Lake, Soda Lake, Exeter Lake, and Roundup Lake.

Use: breeding and migrating

NTS No. 92 P/11, P/14

Status and size of critical habitat within 108 Mile House Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- DU (9 projects)
Crown	0	0	0	
Private	1043	7	1050	
Other	0	0	0	
Total	1043	7	1050	
Unprotected:				- some may be Crown
Crown	0	0	0	
Private	391	3527	3918	
Other	0	0	0	
Total	391	3527	3918	
TOTAL:	1434	3534	4968	



Map XIVb: 24. San Jose River Valley

24. San Jose River Valley

Includes area between Lac la Hache and Williams Lake.

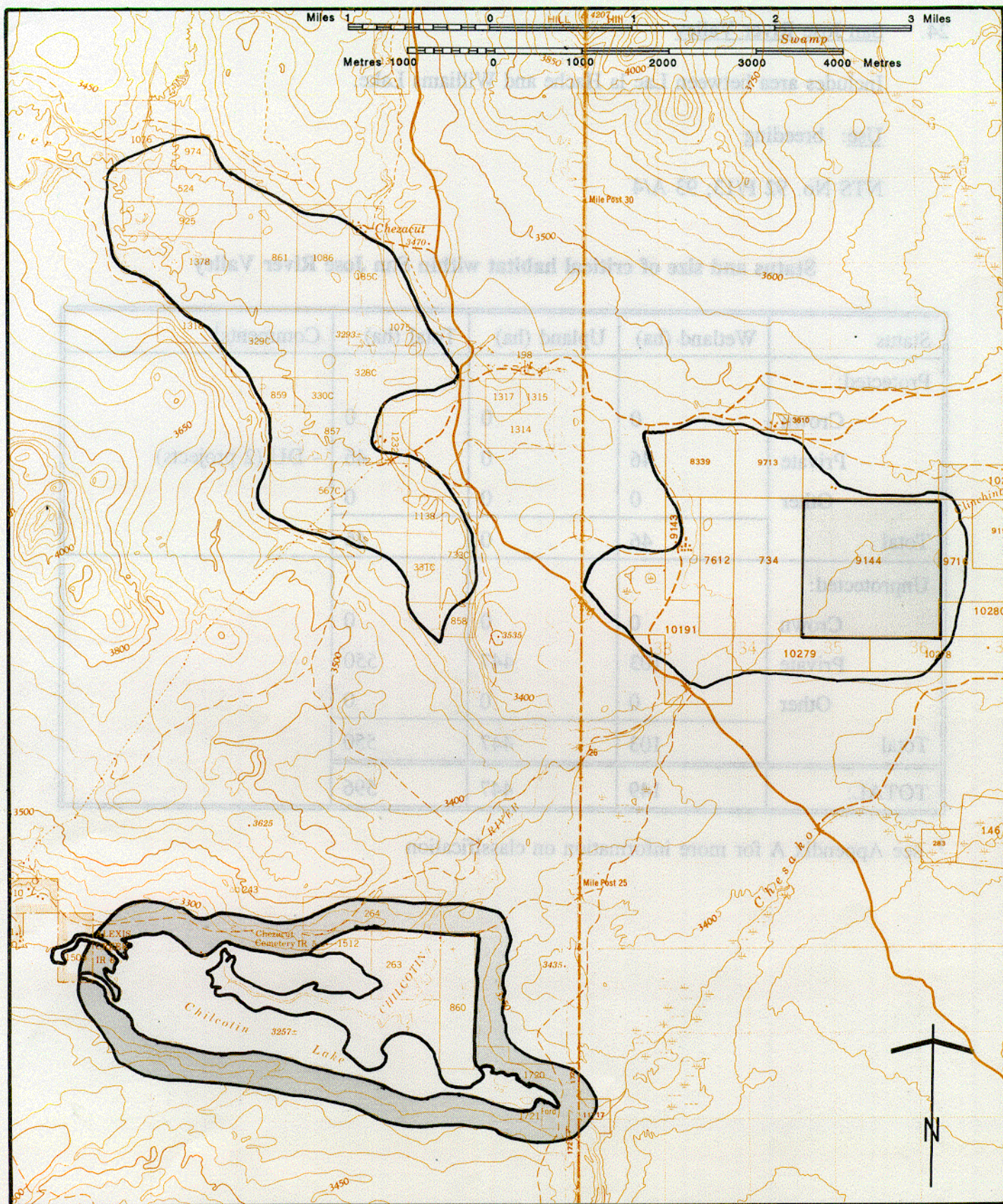
Use: breeding

NTS No. 92 P/13; 93 A/4

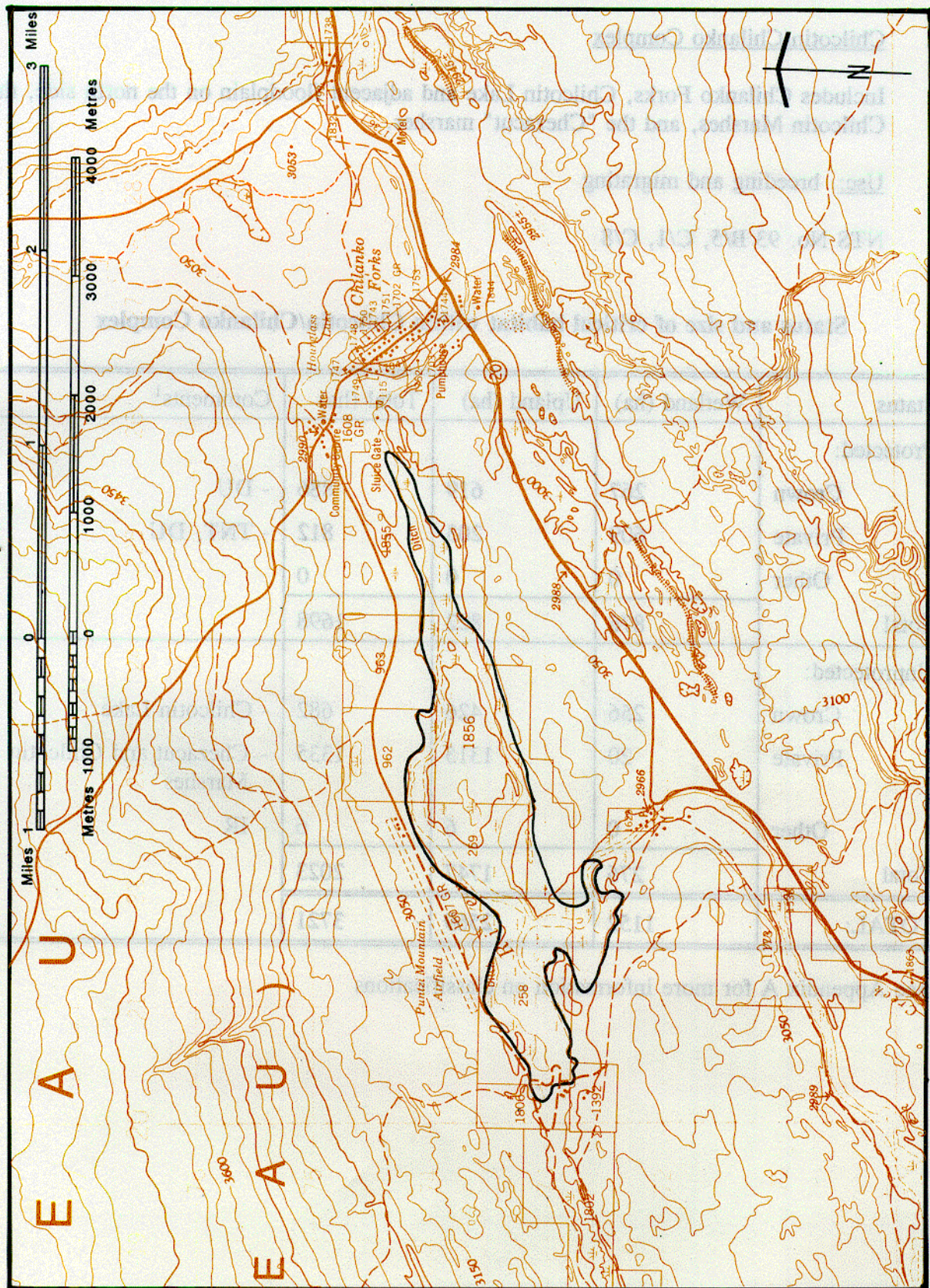
Status and size of critical habitat within San Jose River Valley

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- DU (2 projects)
Crown	0	0	0	
Private	46	0	46	
Other	0	0	0	
Total	46	0	46	
Unprotected:				
Crown	0	0	0	
Private	103	447	550	
Other	0	0	0	
Total	103	447	550	
TOTAL:	149	447	596	

¹ see Appendix A for more information on classification



Map XVa: 25. Chilcotin/Chilanko Complex



Map XVb: 25. Chilcotin/Chilanko Complex

25. Chilcotin/Chilanko Complex

Includes Chilanko Forks, Chilcotin Lake and adjacent floodplain on the north side, the Chilcotin Marshes, and the "Chezacut" marshes.

Use: breeding and migrating

NTS No. 93 B/5, C/1, C/8

Status and size of critical habitat within Chilcotin/Chilanko Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	267	619	886	- DU
Private	609	203	812	- TNT, DU
Other	0	0	0	
Total	876	822	1698	
Unprotected:				
Crown	256	426	682	- Chilcotin Lake
Private	20	1315	1335	- Chezacut and Chilcotin Marshes
Other	0	6	6	- IR
Total	276	1747	2023	
TOTAL:	1152	2569	3721	

¹ see Appendix A for more information on classifications

26. Towdystan/Abuntlet Lakes

Includes Towdystan Lake and surrounding uplands, the east half of Nimpo Lake, Anahim Lake, the Dean River and surrounding marshes up to and including Abuntlet Lake.

Use: breeding and migrating

NTS No. 93 C/6, C/11

Status and size of critical habitat within Towdystan/Abuntlet Lakes

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				
Crown	2000	98	2098	- upland at Towdystan Lake
Private	155	68	223	- upland at Towdystan Lake
Other	125	129	254	- IR; upland at Towdystan Lake
Total	2280	295	2575	
TOTAL:	2280	295	2575	

¹ see Appendix A for more information on classifications

27. Lonesome Lake

Includes only the lake.

Use: wintering

NTS No. 93 C/4, C/5

Status and size of critical habitat within Lonesome Lake

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- within Tweedsmuir Provincial Park
Crown	40	0	40	
Private	0	0	0	
Other	0	0	0	
Total	40	0	40	
Unprotected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
TOTAL:	40	0	40	

¹ see Appendix A for more information on classifications

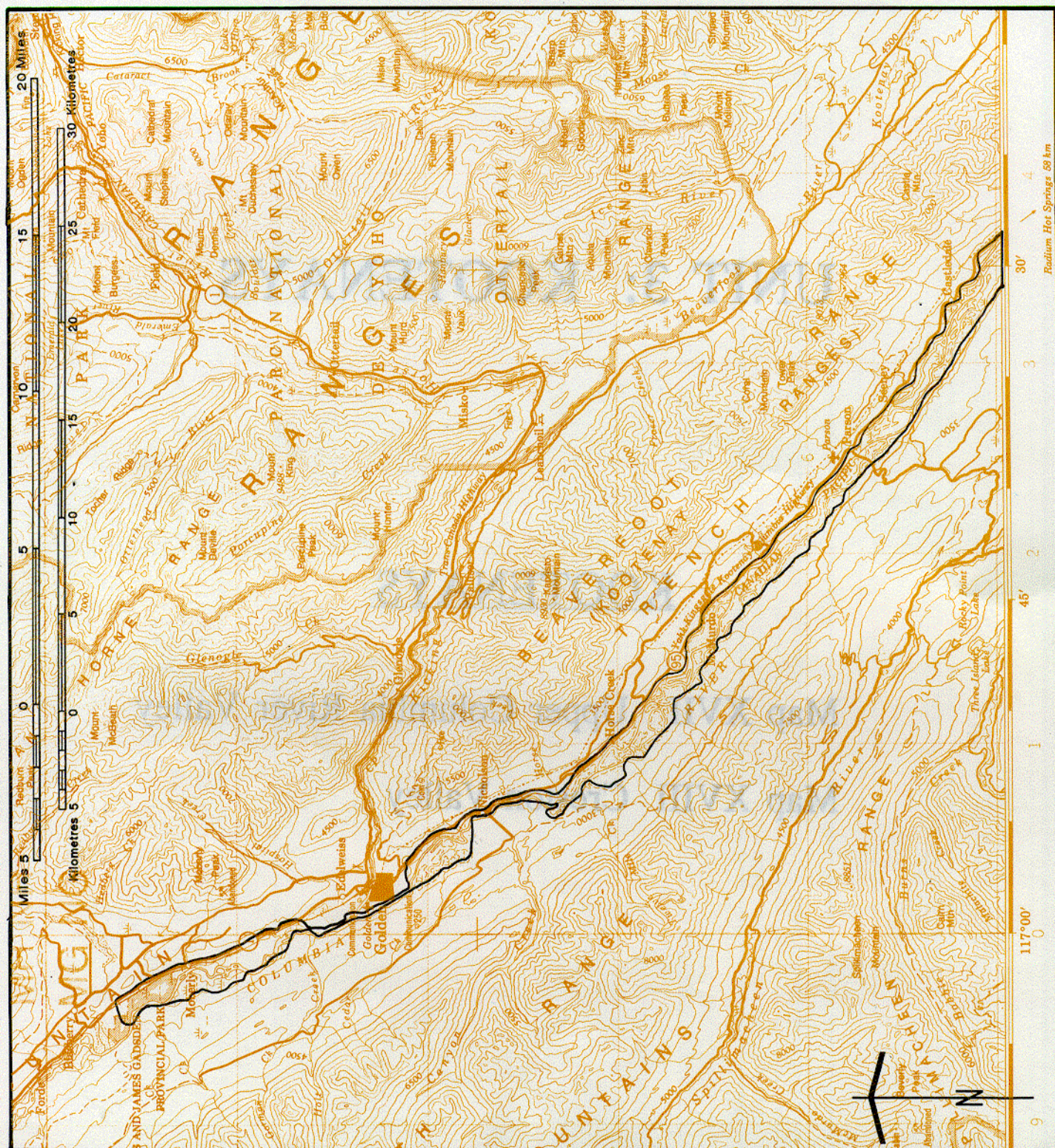
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UNIT 3: KOOTENAYS

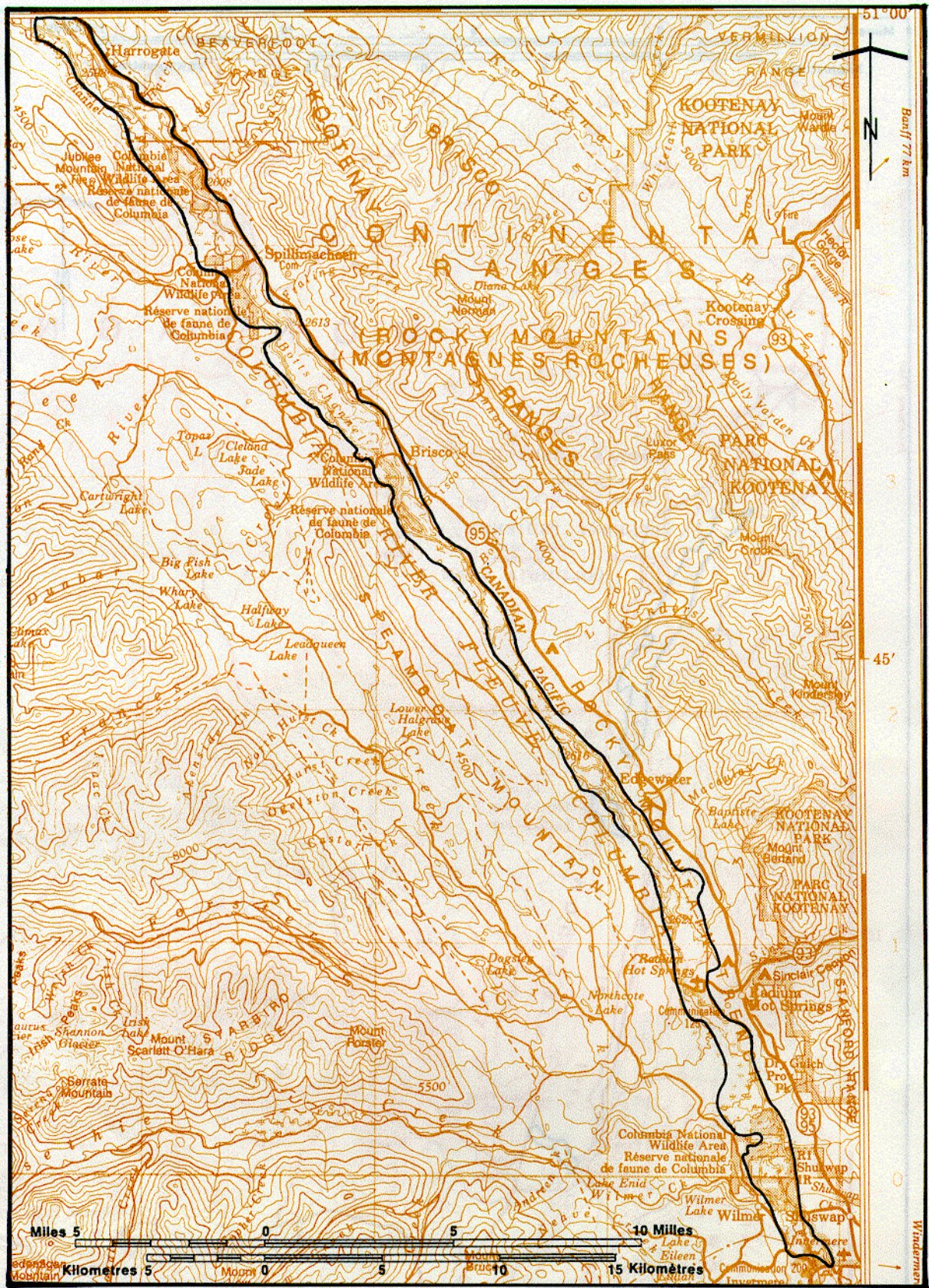
KOOTENAYS

Map XVII Upper Columbia River Valley

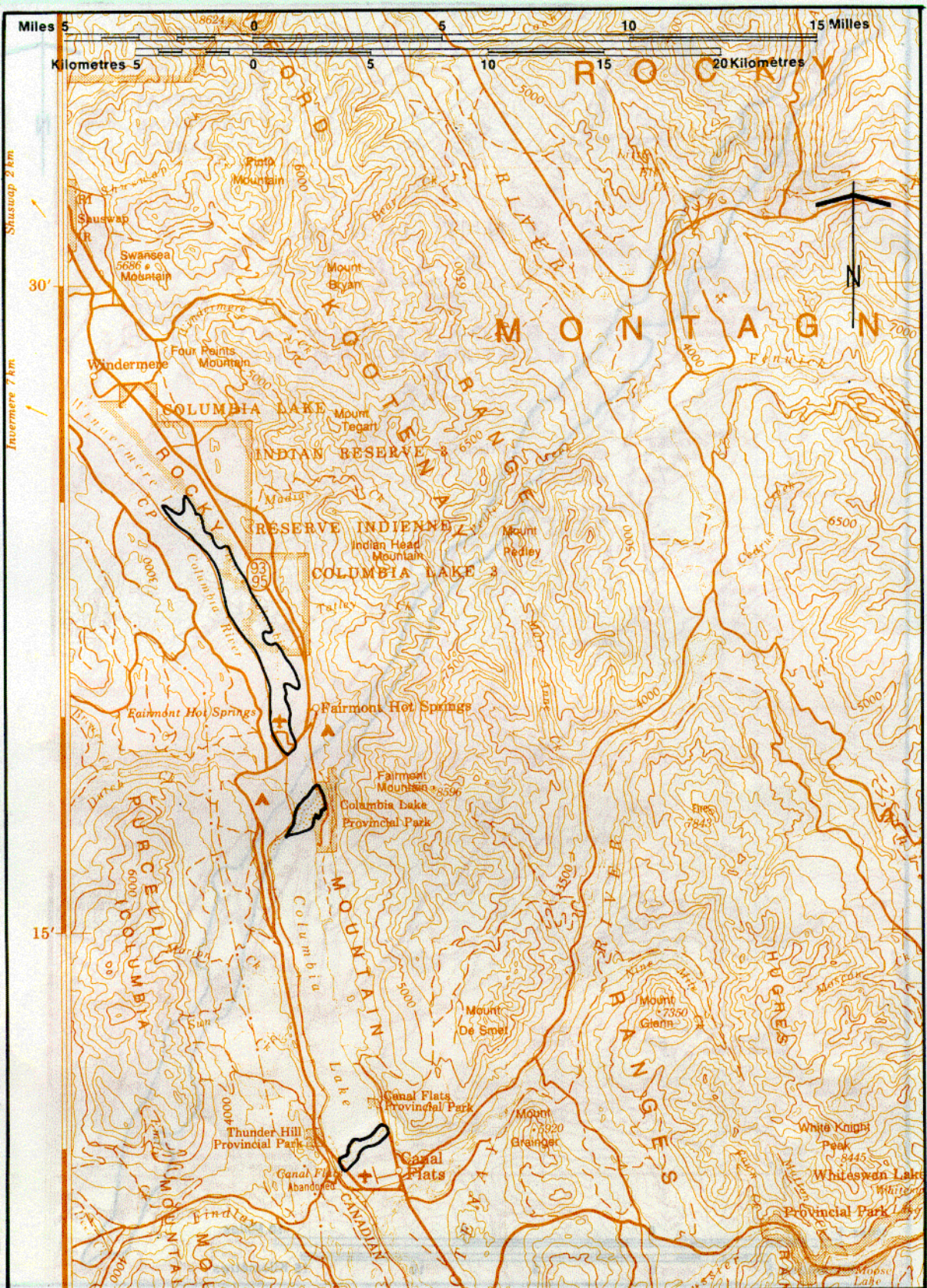
Map XVIII Creston Valley



Map XVIIa: 28. Upper Columbia River Valley



Map XVIIb: 28. Upper Columbia River Valley



Map XVIIc: 28. Upper Columbia River Valley

28. Upper Columbia River Valley

Includes Canal Flats to Blaeberry River.

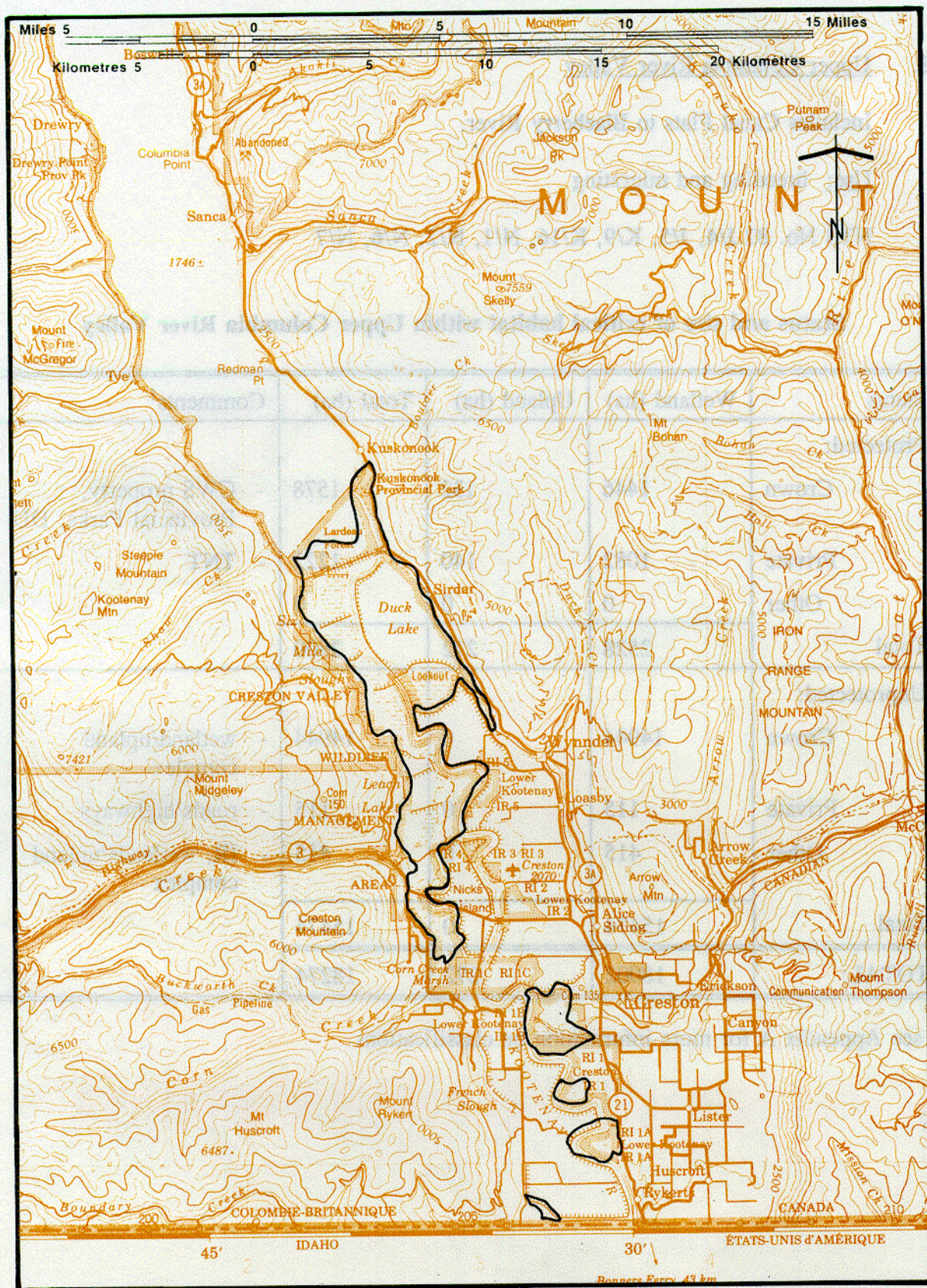
Use: breeding and migrating

NTS No. 82 J/4, J/5, K/9, K/16, N/1, N/2, N/6, N/7

Status and size of critical habitat within Upper Columbia River Valley

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				<ul style="list-style-type: none"> - CWS property, Provincial Parks, DU - TNT
Crown	1446	132	1578	
Private	1082	140	1222	
Other	0	0	0	
Total	2528	272	2800	
Unprotected:				<ul style="list-style-type: none"> - wetland/upland complex - roads/highways - IR, wetlands/upland complex
Crown	14944	0	14944	
Private	115	0	115	
Other	415	0	415	
Total	15474	0	15474	
TOTAL:	18002	272	18274	

¹ see Appendix A for more information on classifications



Map XVIII: 29. Creston Valley

29. Creston Valley

Includes area from United States border to Kootenay Lake.

Use: breeding and migrating

NTS No. 82 F/2, F/7

Status and size of critical habitat within Creston Valley

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- Crown Provincial (OIC), includes both wetland and upland - IR, DU
Crown	6880	0	6880	
Private	0	0	0	
Other	1201	292	1493	
Total	8081	292	8373	
Unprotected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
TOTAL:	8081	292	8373	

¹ see Appendix A for more information on classifications

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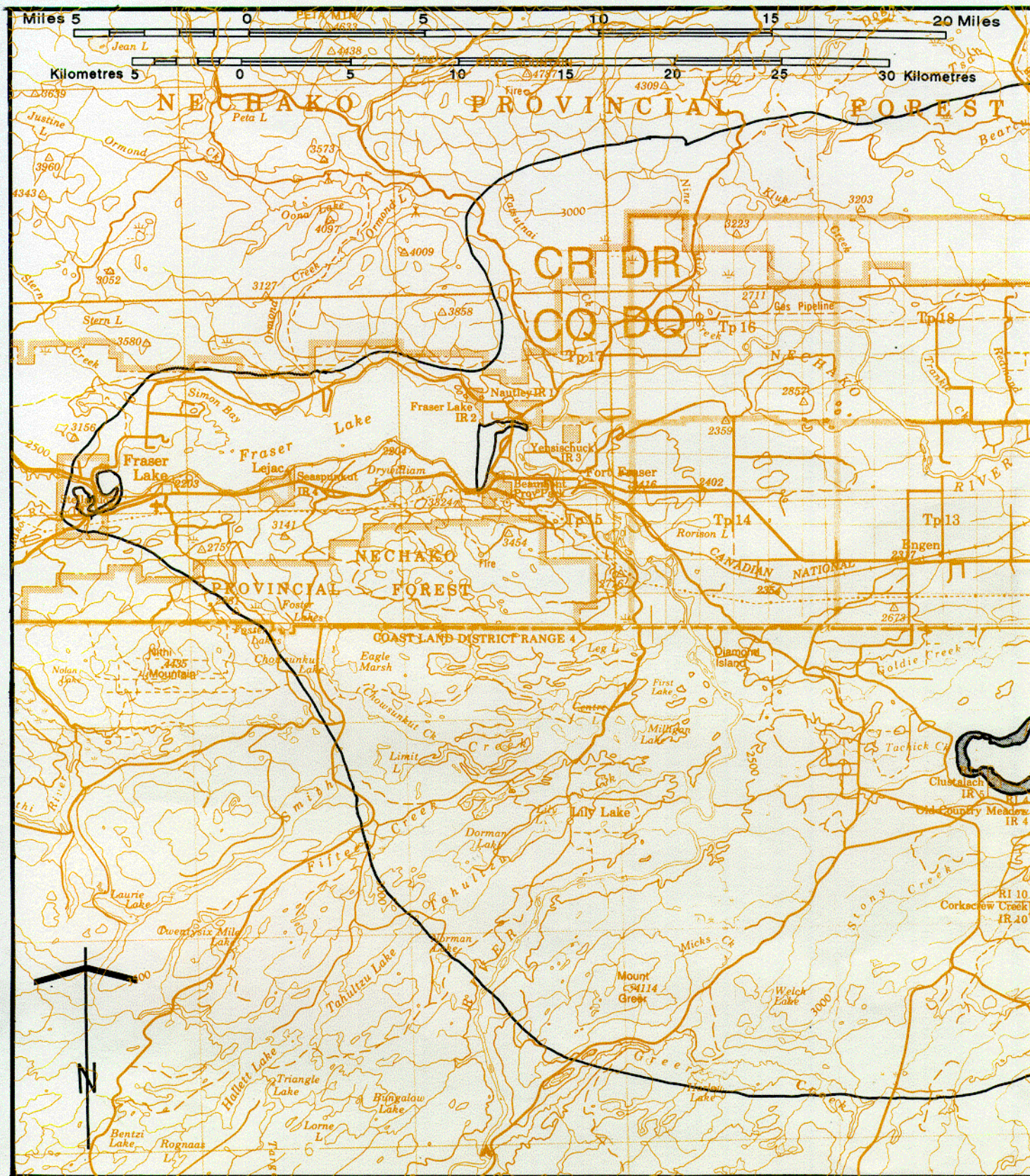
UNIT 4: CENTRAL INTERIOR

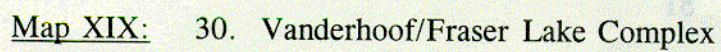
CENTRAL INTERIOR

Map XIX Vanderhoof/ Fraser Lake Complex

Map XX Stuart River

Map XXI Crooked River





30. Vanderhoof/Fraser Lake Complex

Includes elliptical area extending from Vanderhoof 20 km north and south, east to the Stuart River and mid Cluculz Lake, and west to Fraser Lake.

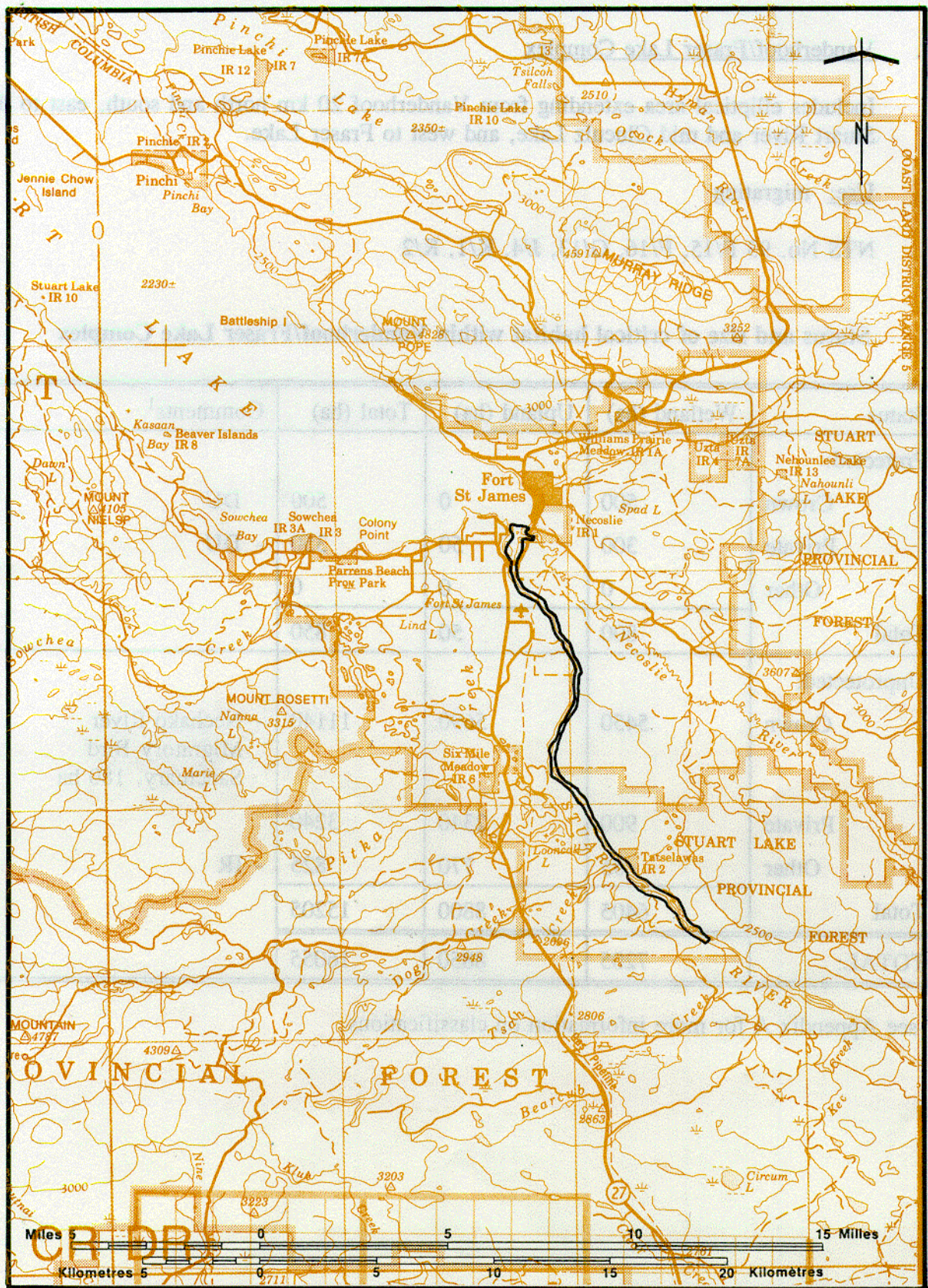
Use: migrating

NTS No. 93 F/15, F/16, G/13, J/4, K/1, K/2

Status and size of critical habitat within Vanderhoof/Fraser Lake Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				
Crown	500	0	500	- DU
Private	300	50	350	- DU
Other	0	0	0	
Total	800	50	850	
Unprotected:				
Crown	5450	5690	11140	- Nechako River Migratory Bird Sanctuary, 180 ha
Private	900	2340	3240	
Other	55	770	825	- IR
Total	6405	8800	15205	
TOTAL:	7205	8850	16055	

¹ see Appendix A for more information on classifications



Map XX: 31. Stuart River

31. Stuart River

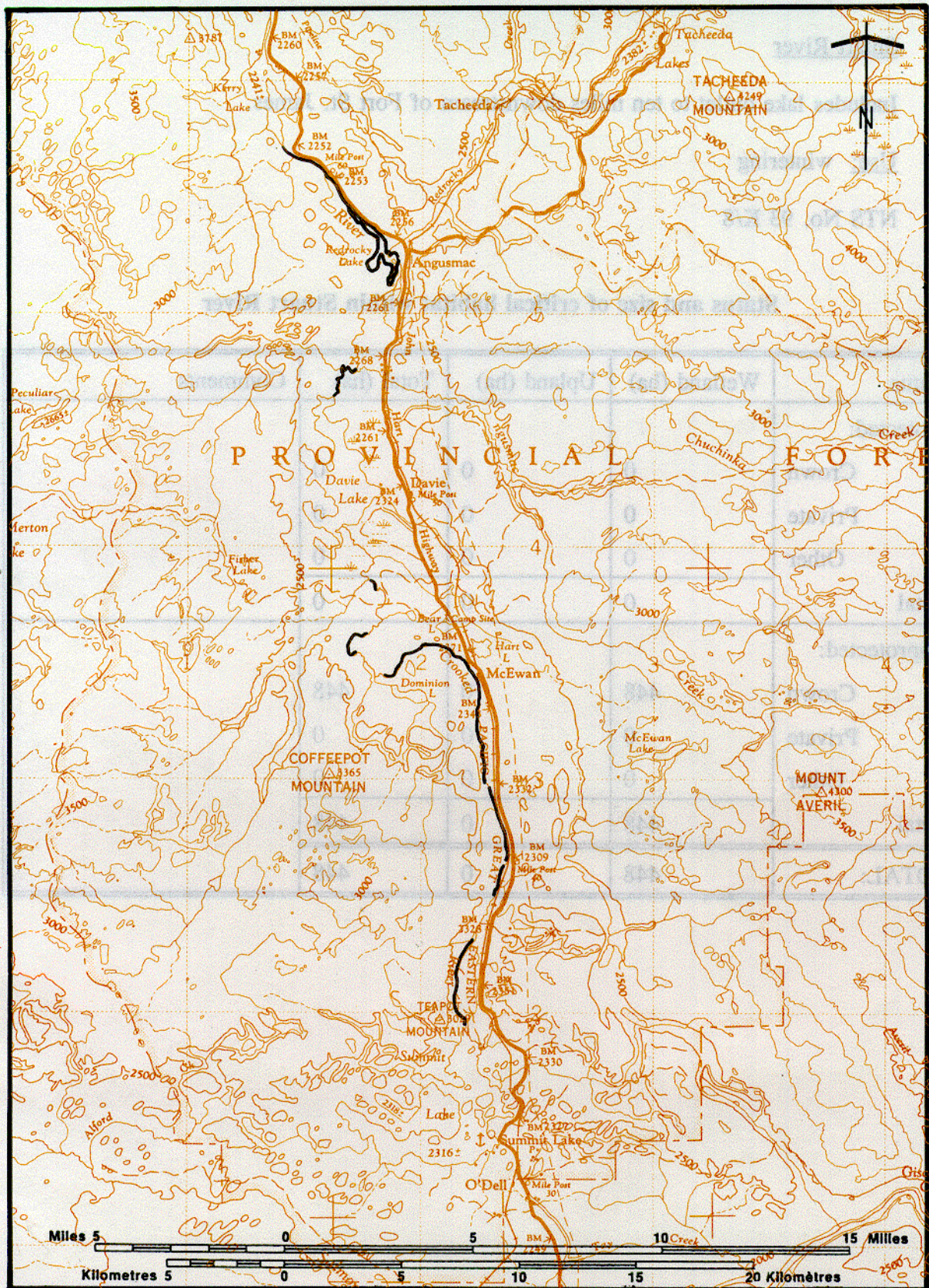
Includes lake outlet to ten miles downstream of Fort St. James.

Use: wintering

NTS No. 93 K/8

Status and size of critical habitat within Stuart River

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				
Crown	448	0	448	
Private	0	0	0	
Other	0	0	0	
Total	448	0	448	
TOTAL:	448	0	448	



Map XXI: 32. Crooked River

32. Crooked River

Includes portions of Crooked River between Kerry Lake and Summit Lake.

Use: wintering

NTS No. 93 J/7, J/10

Status and size of critical habitat within Crooked River

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				
Crown	329	0	329	
Private	0	0	0	
Other	0	0	0	
Total	329	0	329	
TOTAL:	329	0	329	

UNIT 5: NORTHERN INTERIOR

NORTHERN INTERIOR

Map XXII Liard River
Irene Lake & Torpid Creek

Map XXIII Triangle Lake

Map XXIV Upper Teslin River



Map XXIIa: 33. Liard River

33. Liard River

Includes area from Lower Post to Toad River, excluding islands.

Use: migrating

NTS No. 94 M/8, M/9, M/10, M/11, M/12, M/13, M/14, N/5, N/6, N/7, 104 P/16

Status and size of critical habitat within Liard River

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				- 295 km of river
Crown	12389	0	12389	
Private	0	0	0	
Other	0	0	0	
Total	12389	0	12389	
TOTAL:	12389	0	12389	



Map XXIIc: 33. Liard River 34. Irene Lake and Torpid Creek

34. Irene Lake and Torpid Creek

Includes the lake, creek, and associated wetlands.

Use: migrating

NTS No. 94 N/7, N/8

Status and size of critical habitat within Irene Lake and Torpid Creek

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				
Crown	3271	0	3271	
Private	0	0	0	
Other	0	0	0	
Total	3271	0	3271	
TOTAL:	3271	0	3271	



Map XXIII: 35. Triangle Lake

35. Triangle Lake

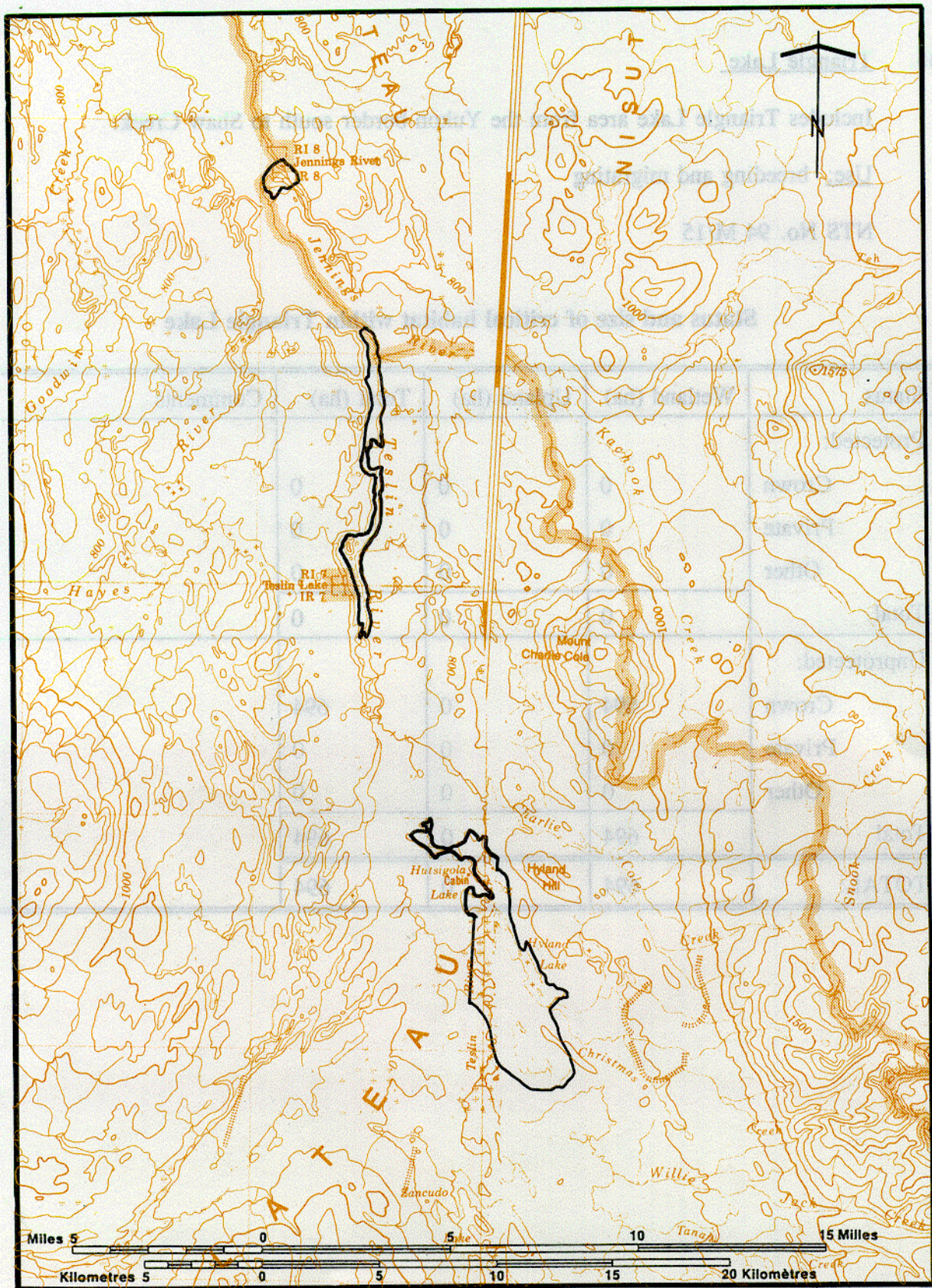
Includes Triangle Lake area from the Yukon border south to Shaw Creek.

Use: breeding and migrating

NTS No. 94 M/15

Status and size of critical habitat within Triangle Lake

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				
Crown	694	0	694	
Private	0	0	0	
Other	0	0	0	
Total	694	0	694	
TOTAL:	694	0	694	



Map XXIV: 36. Upper Teslin River

36. Upper Teslin River

Includes Jennings River delta, Teslin River (Lake Arm), Hutsigola Lake to Hyland Lake.

Use: migrating and breeding

NTS No. 104 N, 104 O

Status and size of critical habitat within Upper Teslin River

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				
Crown	3270	0	3270	
Private	0	0	0	
Other	0	0	0	
Total	3270	0	3270	
TOTAL:	3270	0	3270	

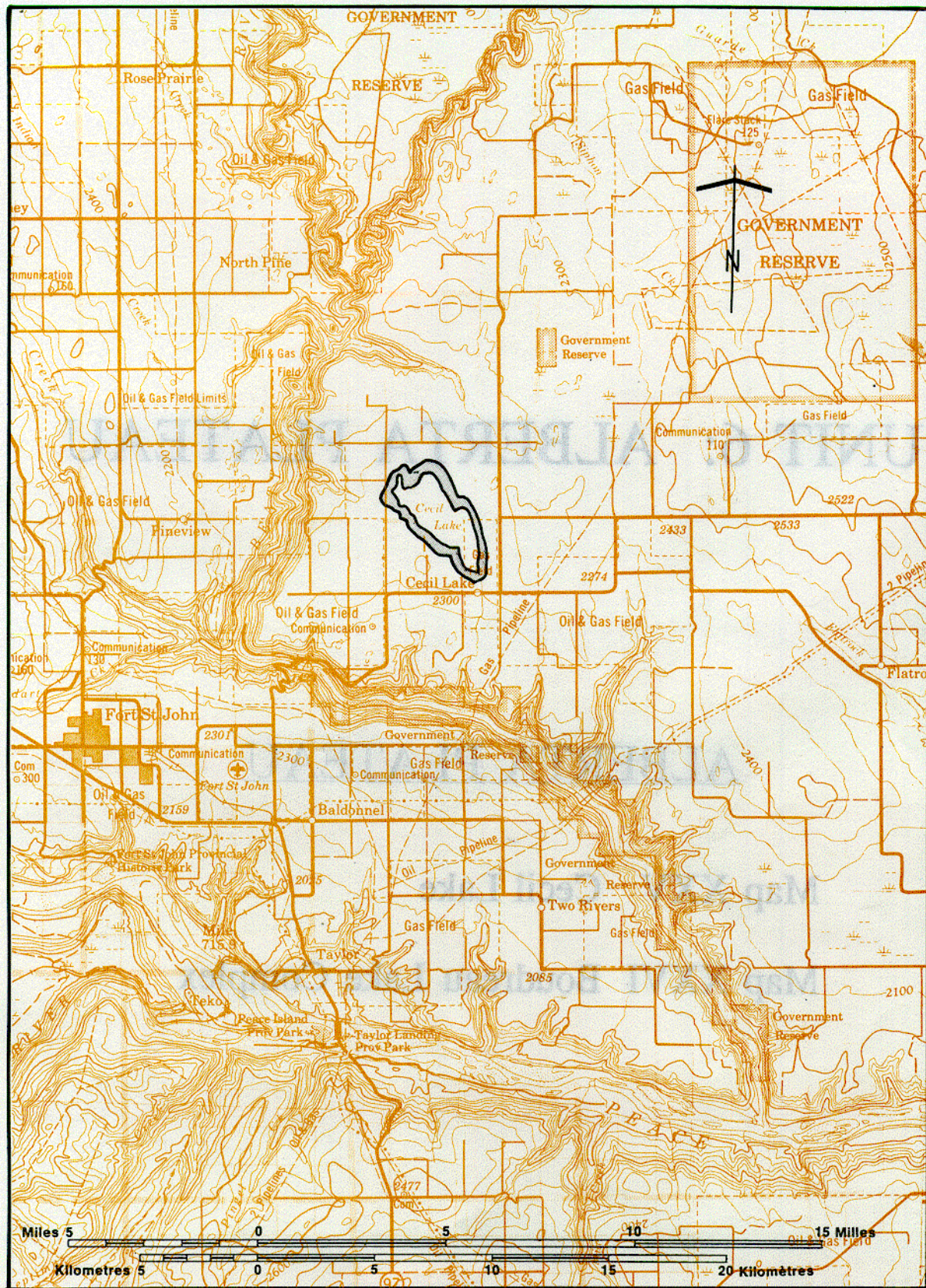
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UNIT 6: ALBERTA PLATEAU

ALBERTA PLATEAU

Map XXV Cecil Lake

Map XXVI Boudreau Lake Complex



Map XXV: 37. Cecil Lake

37. Cecil Lake

Includes Cecil Lake and uplands.

Use: breeding and migrating

NTS No. 94 A/7

Status and size of critical habitat within Cecil Lake

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments ¹
Protected:				- MOE - DU
Crown	0	200	200	
Private	716	0	716	
Other	0	0	0	
Total	716	200	916	
Unprotected:				
Crown	0	0	0	
Private	0	400	400	
Other	0	0	0	
Total	0	400	400	
TOTAL:	716	600	1316	

¹ see Appendix A for more information on classifications



Map XXVI: 38. Boudreau Lake Complex

38. Boudreau Lake Complex

Complex is bounded by Moberly Lake and Moberly River, Pine River, and Peace Rivers.

Use: breeding and migrating

NTS No. 93 P/13, 94 A/3, A/4

Status and size of critical habitat within Boudreau Lake Complex

Status	Wetland (ha)	Upland (ha)	Total (ha)	Comments
Protected:				
Crown	0	0	0	
Private	0	0	0	
Other	0	0	0	
Total	0	0	0	
Unprotected:				
Crown	1420	2400	3820	
Private	0	0	0	
Other	0	0	0	
Total	1420	2400	3820	
TOTAL:	1420	2400	3820	

LITERATURE CITED

- British Columbia Waterfowl Technical Committee. 1989. Cooperative Waterfowl Management Plan for British Columbia. Environment Canada.
- Canadian Wildlife Service. 1986. North American Waterfowl Management Plan: a Strategy for Cooperation. Catalogue No. CW66-80/1986E.
- Canadian Wildlife Service. 1992. Migratory Bird Habitat Conservation Strategy, Pacific and Yukon Region. Unpublished.

APPENDIX A

Additional notes on classification of some Habitat Complexes

1. Boundary Bay Complex
 - Wetlands (protected)
 - Crown Provincial (MOELP) Section 101, 55.3 ha
 - Crown Provincial lot 495 Mud Bay, 58.7 ha
 - Unsurveyed intertidal areas within Crown Provincial reserves managed for wildlife
 - Crown Federal (CWS), 22.9 ha
 - TNT, 25.1 ha
 - Uplands
 - TNT *et al.* 58.7 ha
 - private, 31.23 ha - unprotected outside dyke
2. Roberts Bank
 - Wetlands (unprotected)
 - Crown Provincial (Right-of-way reserves) OIC, including ferry jetty
 - Crown Provincial (MOELP) OIC 2374/61, 11,000 ha (less area of OICs 452/74 and 994/74)
 - Crown Federal (fee simple), 158.1 ha superport jetty
3. Sturgeon Bank
 - Wetlands
 - Crown Provincial (MOELP) lots, 127.35 ha
 - Reserve OIC 908, notation of interest for fish and wildlife management
 - OIC 184/81 greenbelt reserve, environmental sensitivity (MOELP and Environment Canada)
 - Crown Federal (airport), 31.6 ha; North Arm jetty, 23.9 ha
 - Public Works Canada, 1.5 ha
 - private, 74 ha
 - Uplands (Iona Island)
 - Greater Vancouver Sewerage and Drainage District, 270.6 ha
 - Canfor Forest Products, 38.6 ha
 - Musqueam Indian Reserve No. 3, 24 ha.

4. South Arm Marshes & Islands
 - as of July 1993 all islands except Gunn and Williamson are protected
- Uplands

 - TNT *et al.* Kirkland Island, 111.7 ha
5. Pitt Complex
 - Wetlands

 - Crown Provincial, Pitt Wildlife Management Area (WMA) by OIC 1154 under the Wildlife Act, 2782 ha
 - Crown Provincial, Widgeon Slough channels, greater than 100 ha
 - Crown Provincial Ecological Reserve No. 99, 38 ha
 - TNT, 370 ha (1992 purchase)
 - TNT, Widgeon Valley NWA, 100 ha
 - TNT, Addington Point, 26 ha
 - GVRD, 33 ha
 - private (south of Koerner Pass), 400 ha
 - Uplands

 - TNT, Widgeon Valley NWA, 25 ha
 - Crown Provincial Ecological Reserve No. 99, 50 ha
 - TNT, 208 ha (1992 purchase)
7. Naden Harbour
 - Wetlands

 - Crown Provincial, UREP reserve in Stanley Creek and Tee Island areas, 500 ha
8. Delkatla/Kumdis
 - KUMDIS
 - Wetlands

 - Crown Provincial (MOELP) Section 12 Map Reserve for environmental concerns over most of Graham Island portion of wetland complex, 640 ha
 - Uplands (lots adjacent to slough)

 - Crown Provincial (mostly timber licences), 1981.9 ha
 - Private, 463.1 ha
 - STURGESS
 - Uplands

 - UREP reserve on west side Masset Harbour/Sound and Maast Island

DELKATLA

Wetlands/Uplands

- Village of Masset, originally 190 ha

YAKOUN

Wetlands

- Crown Provincial, most vacant unsurveyed

Uplands

- Crown Provincial, UREP Reserve, 2.3 ha

9. Skidegate Channel

Wetlands (Lina Narrows)

- Crown Provincial Map Reserve, estimate 250 ha mudflat

10. Comox Complex

Wetlands

- Crown Provincial unsurveyed
- Crown Provincial Section 101 application for green belt, 12.8 ha

Uplands

- TNT, Millard Creek South, 5.1 ha; Lot 325, Section 1, 19 ha
- private- Millard Creek North, 2.8 ha
- sewage lagoon, 6.6 ha; agricultural land, 533 ha

11. Baynes Sound

Wetlands

- Crown Provincial - notation of interest for fish and wildlife on 2650 ha unsurveyed tidal waters
- Section 101 Reserve, 26 ha (Mud Bay)
- Section 101, 11.8 ha (Fanny Bay)
- TNT, 19.3 ha (Fanny Bay)
- private leases (unprotected) - shake mill, 4.8 ha; oyster leases, 150.8 ha

Uplands

- Crown Federal, (Department Fisheries & Oceans), 60.5 ha.

	<u>Private</u> ¹	<u>Crown Provincial</u>
Deep Bay	208.13 ²	
Mud Bay/Rosewall Creek	0.4	0.35
Little Bay	5.6	
Fanny Bay	26.1	34.2
Tsable River	47.67 ²	

¹ protected by TNT *et al.*

² unprotected uplands from Pacific Estuary Conservation Program action plan 1988

12. Tofino Flats

Wetlands

- Crown Provincial reserves renewed biannually, 1900 ha

Uplands (none protected)

- Crown Provincial, includes Timber Licenses
- private lands around Duckling Island, 235 ha
- private lands of interest (strategic location), 175.1 ha at Maltby Slough and inlet to the east

13. Cowichan/Chemainus Complex

CHEMAINUS

- Crown Provincial log storage leases (size unknown)
- private dyked and undyked foreshore, 264.05 ha
- IR 10 and 6 (upland), 73 ha

COWICHAN

- Crown Provincial Section 101 application Lot 160, 160.3 ha
- Crown Provincial Section 101, 7.3 ha (Mariner's Island)
- Crown Provincial Lot 160 unsurveyed channels, 10.4 ha
- Crown Provincial purchase, 15.2 ha (Blacklie)
- TNT *et al.*, 56.4 ha
- private industrial Lot 160, 135.7 ha (not possible to protect)

SOMENOS

- Crown Provincial (Lots J,K,L Forestry Museum), 40.9 ha (DU agreement)
- Crown Provincial OIC reserves, 28 ha
- TNT, 22.1 ha and 26 ha with MOELP at south end
- private, 40.49 ha on west side of properties
- Richards Creek lowlands, 100 ha

QUAMICHAN

- MacIntyre Creek lowlands, 85 ha

14. Thompson Rivers

- Tranquille WMA, approximately 253 ha OIC administered by MOELP

- DU, 5 projects on Crown land, 101 ha wetland, 21.9 ha upland

Uplands

- Tranquille Farm, 540 ha (private)
- river side fields = 10% of river area, 120 ha
- perimeter of upland ponds, area = 3x pond areas

16. Salmon Arm Foreshore

- TNT, 20.9 ha wetland (DU project on TNT property)
- Salmon Arm District 11 ha, half wetland
- drawdown mudflats (vacant Crown), 125 ha

17. Okanagan Valley/
Shuswap River

- DU - two projects on 42 ha of CWS wetland and 46 ha upland at Vaseux Lake; Swan Lake, 457 ha; McCall Lake, 4.8 ha; Oxyoos Oxbows, 22.1 ha wetland, 32.7 ha upland (all Crown projects)
- MOELP Vaseux Lake WMA, 282 ha
- Internal uplands (including sections along lake edge) included with wetlands; adjacent upland not considered except at Swan Lake and Otter Lake, Mission Flats (Vernon) and 50 m along each side of the Shuswap River

18. Springhouse/Alkali
Lake Complex

- Alkali Lake Wildlife Sanctuary, 93 ha
- DU - three projects, 188 ha of wetland
- Ecological Reserve # 35 on Westwick Lake, 30 ha

19. South Fraser Plateau

- DU - nine projects, 847.2 ha of wetland (about 36% private, 64% Crown); 17.1 ha Crown upland, 42.2 ha private upland
- estimate 90% of upland and unprotected wetland = unprotected Crown; remaining 10% = unprotected private

24. Chilcotin/Chilanko
Complex

- TNT, Chilanko Lake, 129.54 ha of floodplain marsh to north of lake; Chilcotin Marshes, 469.53 ha (267 wetland + 203 upland); Chilanko Forks, 212.1 ha wetland
- DU, Chilcotin Lake, 343.98 ha including TNT and Crown areas (Total Crown lake

- and river marshes = 470 ha); Chilanko Forks, 265 ha wetland, 619 ha upland; Chilcotin Marshes, 267.3 ha wetland (Oct/90 preconstruction value)
 - private unprotected "Chezacut" Marshes, 20 ha open water and 1050 ha seasonally flooded marsh, river and dry farmland
 - Chilcotin Marsh Lot 9144, 265 ha of unprotected private upland
 - unprotected upland around Chilcotin Lake, 426 ha Crown and 61 ha IR
28. Upper Columbia River Valley
- DU projects; two at Moberly Marsh and two at Bummer flats, total 391.2 ha wetlands and 131.6 ha uplands
 - TNT - three parcels including wetlands and upland forest, wetland portions, and some uplands included in DU projects
 - Crown Federal, Wilmer NWA, one parcel, 400 ha
 - Moberly Marsh Provincial Class 1 Park
 - Crown Provincial - UREP reserve on all land subject to flooding from Canal Flats to Golden.
29. Creston Valley
- Crown Provincial - Creston Valley Wildlife Management Authority by OIC, 6880 ha
 - DU - six projects on lower Kootenay River, 2057 ha wetland and 88 ha upland on Creston Valley Wildlife Management Authority property
30. Vanderhoof/Fraser Complex
- Nechako River Migratory Bird Sanctuary, 180 ha
 - DU; 21 projects on private land = 800 ha wetland, 50 ha upland; surrounding uplands approximately 60% private and 40% Crown (of wetland, 200 ha assumed to be not shown on maps and were added to wetland total)
 - overall ownership on surveyed blocks (on 1:50 000 NTS map) estimated at 50:50 private:Crown for wetlands and uplands

- Fraser Lake (Crown) - surrounded by IR; used by Canada Geese; arbitrary amount included = 200 ha

37. Cecil Lake

- DU - project, 716 ha, no water licence or water control structure
- MOELP, estimated 200 ha of upland surrounding lake

APPENDIX B

Glossary

B.C.	British Columbia
BCE	British Columbia Environment (of MOELP)
CWS	Canadian Wildlife Service
DU	Ducks Unlimited Canada
GVRD	Greater Vancouver Regional District
IR	Indian Reserve
MOELP	B.C. Ministry of Environment, Lands and Parks
NWA	National Wildlife Area (federal)
OIC	Order-in-Council
TNT	The Nature Trust of British Columbia
UREP	Use, Recreation and Enjoyment of the Public
WMA	Wildlife Management Area (provincial)