Canada Alberta Northwest Territories

Northern River Basins Study











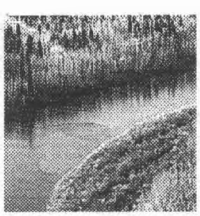



Prepared for the
Northern River Basins Study
under Project 2362-B1

by
Mark Wayland and Todd Arnold
Canadian Wildlife Service

NORTHERN RIVER BASINS STUDY PROJECT REPORT NO. 6

A SURVEY OF BIRDS
WAPITI, PEACE AND ATHABASCA RIVERS
JUNE AND JULY, 1992

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PREFACE:

The Northern River Basins Study was initiated through the "Canada-Alberta-Northwest Territories Agreement Respecting the Peace-Athabasca-Slave River Basin Study, Phase II - Technical Studies" which was signed September 27, 1991. The purpose of the Study is to understand and characterize the cumulative effects of development on the water and aquatic environment of the Study Area by coordinating with existing programs and undertaking appropriate new technical studies.

This publication reports the method and findings of particular work conducted as part of the Northern River Basins Study. As such, the work was governed by a specific terms of reference and is expected to contribute information about the Study Area within the context of the overall study as described by the Study Final Report. This report has been reviewed by the Study Science Advisory Committee in regards to scientific content and has been approved by the Study Board of Directors for public release.

It is explicit in the objectives of the Study to report the results of technical work regularly to the public. This objective is served by distributing project reports to an extensive network of libraries, agencies, organizations and interested individuals and by granting universal permission to reproduce the material.

NORTHERN RIVER BASINS STUDY
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Whereas the above publication is the result of a project conducted under the Northern River Basins Study and the terms of reference for that project are deemed to be fulfilled,
IT IS THEREFORE REQUESTED BY THE STUDY OFFICE THAT;
this publication be subjected to proper and responsible review and be considered for release to the public.

(Dr. F.J. Wrona, Ph.D., Science Director) — (Date) 2 June 93

Whereas it is an explicit term of reference of the Science Advisory Committee "to review, for scientific content, material for publication by the Board",
IT IS HERE ADVISED BY THE SCIENCE ADVISORY COMMITTEE THAT;
this publication has been reviewed for scientific content and that the scientific practices represented in the report are acceptable given the specific purposes of the project and subject to the field conditions encountered.
SUPPLEMENTAL COMMENTARY HAS BEEN ADDED TO THIS PUBLICATION: [ ] Yes [ ] No

(Dr. P. A. Larkin, Ph.D., Chair) — (Date) 11 June 93

Whereas it is the duty of the Operations Committee to attend to the day-to-day management of the Study on behalf of the Study Board,
IT IS THEREFORE RECOMMENDED BY THE OPERATIONS COMMITTEE THAT;
this publication be released to the public and it is reported that
THIS PUBLICATION HAS BEEN REVIEWED BY THE HEALTH ASSESSMENT COMMITTEE AND SUBSEQUENTLY FORWARDED TO APPROPRIATE HEALTH AUTHORITIES: [ ] Yes [ ] No

Whereas the Study Board is satisfied that this publication has been reviewed for scientific content and for immediate health implications,
IT IS HERE APPROVED BY THE BOARD OF DIRECTORS THAT;
this publication be released to the public, and that this publication be designated for: **[ ] STANDARD AVAILABILITY [ ] EXPANDED AVAILABILITY**

(Bev Burns, Co-chair) — (Date) 12/6/93

(Peter Melnychuk, Co-Chair) — (Date) 22/06/93

A SURVEY OF BIRDS
WAPITI, PEACE AND ATHABASCA RIVERS
JUNE AND JULY, 1992

STUDY PERSPECTIVE

> ***Related Study Questions***
>
> *11) Have the riparian vegetation, riparian wildlife and domestic livestock in the river basins been affected by exposure to organochlorines or other toxic compounds?*
>
> *12) What native traditional knowledge exists to enhance the physical science studies in all areas of enquiry?*

Contaminants, their origin, movement, accumulation and effects in the aquatic ecosystem of the Peace, Athabasca and Slave rivers, are a major area of concern for the Northern River Basins Study. A number of wildlife species are dependent on these aquatic ecosystem. The mobility of wildlife species increases the complexity of identifying the source of contamination and its consequence, particularly on species that migrate away from these aquatic systems. Some of these variables can be controlled by selecting species and life stages that would allow investigators to distinguish the contaminants contributed by the Peace, Athabasca and Slave aquatic ecosystem from other, sometimes more distant, sources.

In advance of any field collection is the need to identify and determine the relative abundance of bird species utilizing the riverine environment of the Peace, Athabasca and Slave rivers. This report chronicles the field survey established to describe the composition of bird (avian) use within these aquatic ecosystem and the identification of a species useful for contaminant investigation.

This bird survey established the groundwork for any follow-up surveys to monitor change in the bird community and their use of the Peace, Athabasca and Slave rivers. A number of bird species were recommended for further examination as to their utility for monitoring the effect of contamination and habitat change. From this survey, young-of-the-year mergansers were recommended as the species of choice for contaminant surveys. Contaminant results from the merganser survey will be reported upon in a subsequent Northern River Basins Study report.

EXECUTIVE SUMMARY

The purpose of this report is to document the distribution and abundance of birds on the Peace and Athabasca River systems. This information is essential for the selection of appropriate sentinel species for monitoring levels and effects of contaminants in wildlife on these river systems. Therefore it is pertinent to the Northern River Basins Study (NRBS) objectives related to documenting levels and effects of contaminants in aquatic life and riparian wildlife (NRBS - questions 1a, 4a, and 11).

A review of the available literature revealed that information regarding bird distribution and abundance on these river systems was limited to the Peace-Athabasca delta (P-A delta) and to the lower reaches of the Athabasca River, mainly below Fort McMurray. Moreover, much of the information was limited to waterfowl which are not very good indicator species for studies of bioaccumulable contaminants because of their omnivorous feeding habits. Therefore, it was deemed necessary to conduct aerial surveys at selected sites on the mainstem rivers as well as in the P-A delta which is an extremely important site for migratory birds and other wildlife. The surveys were flown between June 30 and July 8, 1992 to coincide with the breeding season for most species of birds. The emphasis was placed on the breeding season because it was recognized that studies of contaminants levels and effects in birds should focus on young, pre-fledged birds to avoid the confounding factor of contamination on the wintering grounds or on migratory routes. The mainstem river sites were as follows: approximately 100 km upstream from Fort McMurray and 100 km downstream from the SUNCOR plant on the Athabasca River and the same distances up and downstream from bleached kraft pulp and paper mills at the following sites; on the Athabasca River at Hinton and Athabasca, on the Wapiti River at Grand Prairie and on the Peace River at Peace River. In addition, local or traditional knowledge was tapped by telephone inquiries directed towards organizations and individuals who were known to have some knowledge of these river systems, including the P-A delta.

Surveys on the mainstem rivers covered 1700 km of shoreline. Birds were not abundant on the mainstem rivers. In particular, nesting and brood-rearing birds were rare. Thirty-five species of birds were observed; however, an average of only 3.9 species were seen per 10 km section of river. The most frequently encountered species were "unidentified" sandpipers, Common Goldeneye, Mallard, Common Merganser, "unidentified" gull, Canada Goose and Bald Eagle. Use of the mainstem rivers by breeding birds and their young was exceedingly low. In particular, fish-eating species which are considered to be among the best indicators of bioaccumulable pollutants because of their high position within the aquatic food web, were low in abundance. Common Merganser (a fish-eating species) chicks were present both up and downstream only at the Grand Prairie site. Only 4 active Bald Eagle (another fish-eating species) nests were encountered on the mainstem river sites. Colonies of breeding herons, cormorants or gulls were not seen. Among the non-fish-eating species, pre-fledged young were most common for the Canada Goose and the Mallard. However, the omnivorous and partially terrestrial food habits of these species diminishes their value as indicators of aquatic, bioaccumulable contaminants.

Surveys in the P-A delta revealed a large number and high density of waterfowl species. Surveys were flown over 940 km of shoreline in the P-A delta. Thirty two species were recorded with an average of 25.1 fledged birds/km. Broods were less common, averaging 0.07/km. However, our survey technique in the P-A delta, using a fixed-wing aircraft, likely underepresented the absolute numbers of waterfowl broods. In terms of relative importance, broods of Mallard, American Coot, American Widgeon and Lesser Scaup were most frequently encountered. With the exception of the Lesser Scaup, these species are omnivorous during the brood period, rendering them ineffective as monitors of bioaccumulable contaminants. The Lesser Scaup which consumes primarily aquatic invertebrates, especially amphipods, may be of greater value in this regard. Fish-eating species were not abundant in the P-A delta. This was especially true for breeding members of those

species. Two active Bald Eagle nests were seen on the P-A delta.

Local or traditional knowledge contributed a great deal to this study, especially for covering areas which were not included in the surveys. Through this knowledge-base, we learned of a well-known White Pelican colony on the Slave River, 2 Great-Blue Heron colonies, including one on the Athabasca River near SUNCOR which is currently inactive, 4 osprey nests on the upper Athabasca, 2 of which were confirmed by our surveys, 18 Bald Eagle nests, one of which was confirmed by our surveys and two of which we failed to confirm and a common tern nesting colony on Lake Claire in the P-A delta.

The generally low abundance of most species of birds along the mainstem rivers suggests that directed studies aimed at one or two species of birds, will encounter substantial problems in obtaining adequate sample sizes. Species that may be well-suited to such studies include Common Mergansers, Common Goldeneyes, sandpipers, gulls and Bald Eagles, but even these species would require enormous study areas in order to obtain adequate sample sizes. Nevertheless, because Bald Eagle nests are conspicuous and because our survey data and traditional knowledge indicates that this species nests in low densities throughout these drainage basins, it is conceivable that it might be a suitable species for a basinwide monitoring program. This conclusion is tentative and depends largely on the ability of the current analytical chemistry technology for detecting levels of trace organochlorines such as dioxins and furans in blood samples as well as on the validity of the traditional knowledge that emerged for this species. We emphasize that this species would be suitable, at best, for a basinwide survey of contaminants levels because of its low density. For studies aimed at assessing the level and effects of contaminants at sites far downstream from known point sources of contaminants, the White Pelican colony on the Slave River should be considered. However, because this species is protected by the Government of Alberta, the NRBS would have to obtain special permission from the government before embarking upon research that would necessitate visits to the colony during the breeding season.

Permission would likely hinge on the development of techniques or equipment that would reduce the human disturbance factor to zero. In addition, a suitable control colony would have to be monitored. The Common Tern colony on Lake Claire in the P-A delta may also provide a valuable indication of contaminants in fish-eating wildlife at sites far downstream from point sources. This colony would also provide a picture of contaminants exposure of fish-eating birds in the P-A delta. As with the pelican colony, a suitable control colony would be required. If the P-A delta is to be a focal point for NRBS studies of wildlife, then waterfowl should be considered, if only because of their overwhelming numerical dominance of the aquatic bird fauna in that area. Finally, the emphasis in this study was on large, conspicuous species that are easily seen during aerial surveys. It must be recognized that our techniques were not effective for many small passerine and shorebird species. The utility of such species for site-specific studies should not be ruled out.

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1.0 INTRODUCTION

Among the 16 guiding questions that the Northern River Basins Study (NRBS) is intended to address, questions 1, 4(a) and 11 specifically refer to assessing contaminants levels in and effects on aquatic biota and riparian wildlife. Question 1a asks "How has the aquatic ecosystem, including fish and/or other aquatic organisms been affected by exposure to organochlorines or other toxic compounds?". Because many species of wildlife rely on aquatic organisms for their food, they, too, must be considered to be aquatic. Question 4a asks "Describe the contents and nature of the contaminants entering the system and describe their distribution and toxicity in the aquatic ecosystem with particular reference to water, sediments, and biota?". Again, because wildlife feed on many aquatic organisms, they must surely be considered as part of that ecosystem. Finally, question 11 asks "Have the riparian vegetation, riparian wildlife and domestic livestock in the river basins been affected by exposure to organochlorines or other toxic compounds?".

Among the different groups of wildlife, birds are often sensitive indicators of environmental perturbations. Environmental concerns about DDT, for example, were first manifested because of perceived effects on bird populations (Carson 1962). Because birds often occur near or at the top of food chains where lipophilic contaminants bioaccumulate and because they are a highly conspicuous and valued component of the fauna, they can be appropriate and useful for addressing questions related to ecosystem integrity and cumulative effects of a host of lipophilic contaminants. Indeed, studies of Herring gulls (Larus argentatus) on the Great Lakes and Great-blue herons (Ardea herodias) in British Columbia have demonstrated levels of lipophilic contaminants in their eggs many times higher than those in their food base (Norstrom et al. 1978, Fox and Weseloh 1987, Elliott et al. 1989). Moreover toxic effects of lipophilic contaminants on several fish-eating species of birds have been observed (Fox and Weseloh 1987, Government of Canada 1991).

By building a wildlife component into their water quality program, the NRBS has recognized the utility of wildlife in addressing questions related to the biomagnification of certain contaminants through ecosystems. Unfortunately, outside of a few specific areas, such as the Peace-Athabasca delta (P-A delta) and the lower reaches of the Athabasca River near Fort McMurray (Boyd 1971, Nieman and Dirshl 1973, Hennan 1973, Erickson 1974, Beaver and Ballantyne 1979, Hennan and Munson 1979, Munson et al. 1980), the distribution, abundance and social status of birds on these river systems are poorly known. Moreover, on the P-A delta, where most of the studies have been done, the data is limited mainly to waterfowl and exludes other species. The scarcity of this information makes it extremely difficult to plan and implement studies of contaminant levels in and effects on birds on these river systems.

Therefore, in order to bridge this information gap so that an effective contaminants program can be developed for birds on these river systems, the NRBS requested information on their distribution and abundance on the mainstem rivers and in the P-A delta. This report summarizes our efforts to obtain this information.

2.0 METHODS

Two approaches were used in order to determine bird distributions and abundances. The first and most concerted approach consisted of bird surveys conducted on selected stretches of the mainstem rivers and in the P-A delta. The second approach consisted of tapping local or traditional knowledge of birds on these rivers.

Surveys were done upstream and downstream from sites considered to be potential major sources of pollutants as well as in the P-A delta which is a major site for sediment deposit as well as an extremely important wildlife area. The mainstem river sites included 1) the town of Athabasca near the ALPAC site, 2) the town of Hinton (Weldwood site), 3) Grand Prairie (Proctor and Gamble), 4) Peace River near Daishowa and 5) upstream from Fort McMurray and

downstream from SUNCOR (Fig. 1). At Athabasca and Peace River, the dividing lines between upstream and downstream sections were the townsites rather than the millsites. We recognize that this approach underrepresented the amount of river surveyed downstream from these two mill sites.

Aerial surveys on the mainstem rivers were done with a Bell 206 Jet Ranger helicopter travelling up and down each shoreline at an elevation of approximately 100 m at an airspeed of 100 to 120 km per hour. Shorelines of islands were also surveyed. In planning these surveys, 4 hours of flying time were alotted for each site. This enabled approximately 400 km of shoreline to be surveyed at each site. The one exception was at Athabasca where only 3 hours were alotted to the survey because the charter service charged 1 hour ferrying time from Slave Lake to Athabasca. At each survey site, the upstream and downstream portions were divided into sections, each section consisting of approximately 20 km of shoreline including both banks of the river as well as island shorelines (Figs. 2-6). Shoreline distances were originally measured on 1:250,000 topographic maps in order to delineate sections. Bird sightings were plotted on overlays of aerial photos. Attempts were made to determine species, age and social status (breeding pair, flocked non-breeding birds, brood, nestling, etc.). Data were coded according to species code, American Ornithologists' Union species numeric code (Appendix 1), site, section (U1, U2, U3, etc., D1, D2, D3, etc.), social status, age, habitat where the birds were seen (Appendix 2), survey date, time and weather conditions. The raw data for the mainstem river surveys is presented in Appendix 13.

In addition to supplying data on birds, we have also examined several habitat features on the mainstem river sites. Our approach to doing this was to consider each section at each site (i.e. - U1, U2, U3, ..., D1, D2, D3, ...) as a habitat unit. We then used 1:60,000 aerial photos and 1:250,000 topographic maps to make measurements of the following habitat variables: 1) mean river width, here defined as the mean of the width of the river recorded at three equidistant locations for a particular section; 2) total

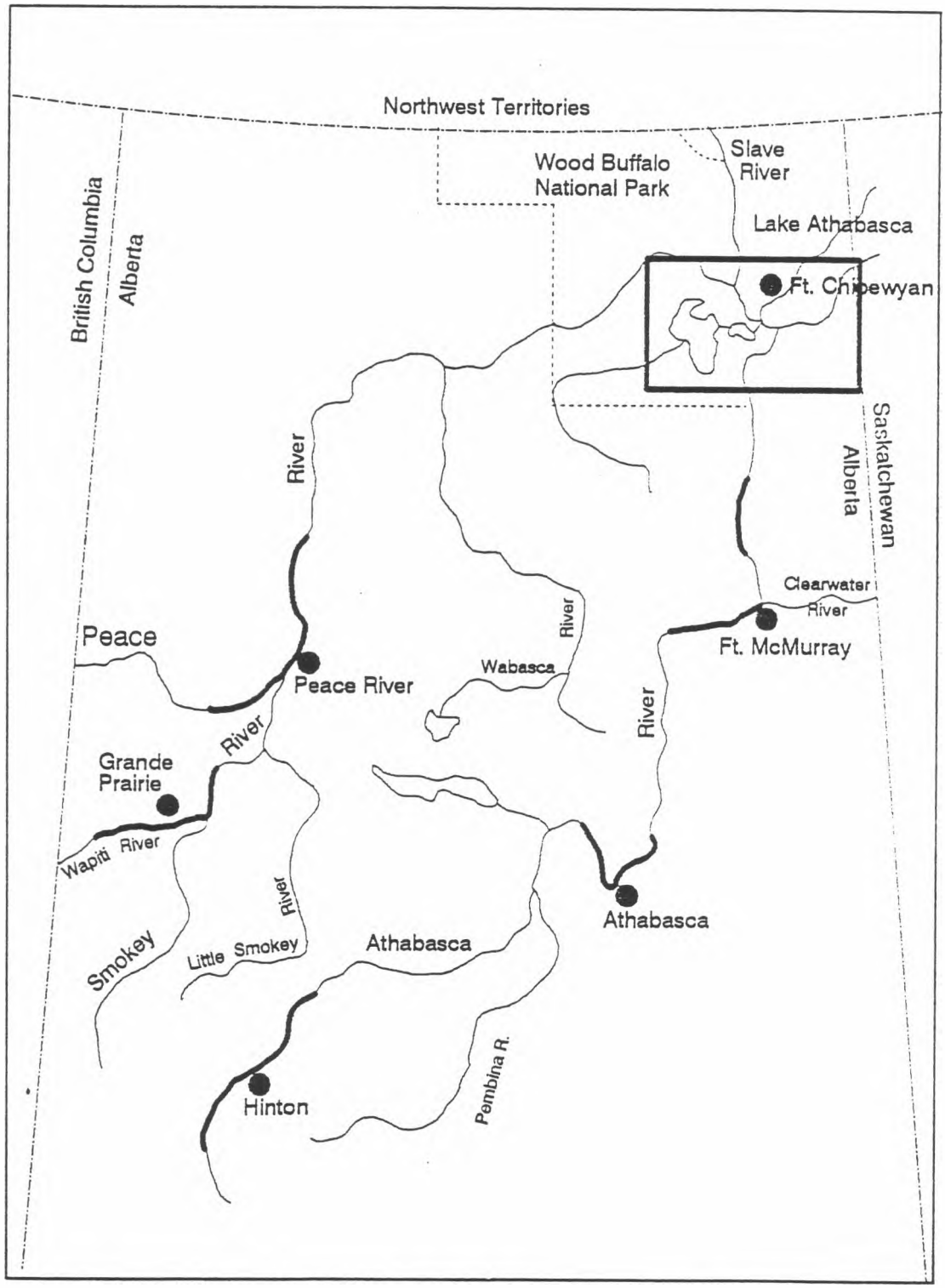

Fig. 1. Survey site locations on the Peace and Athabasca River systems.

Fig. 2. Detail of Athabasca bird survey site.

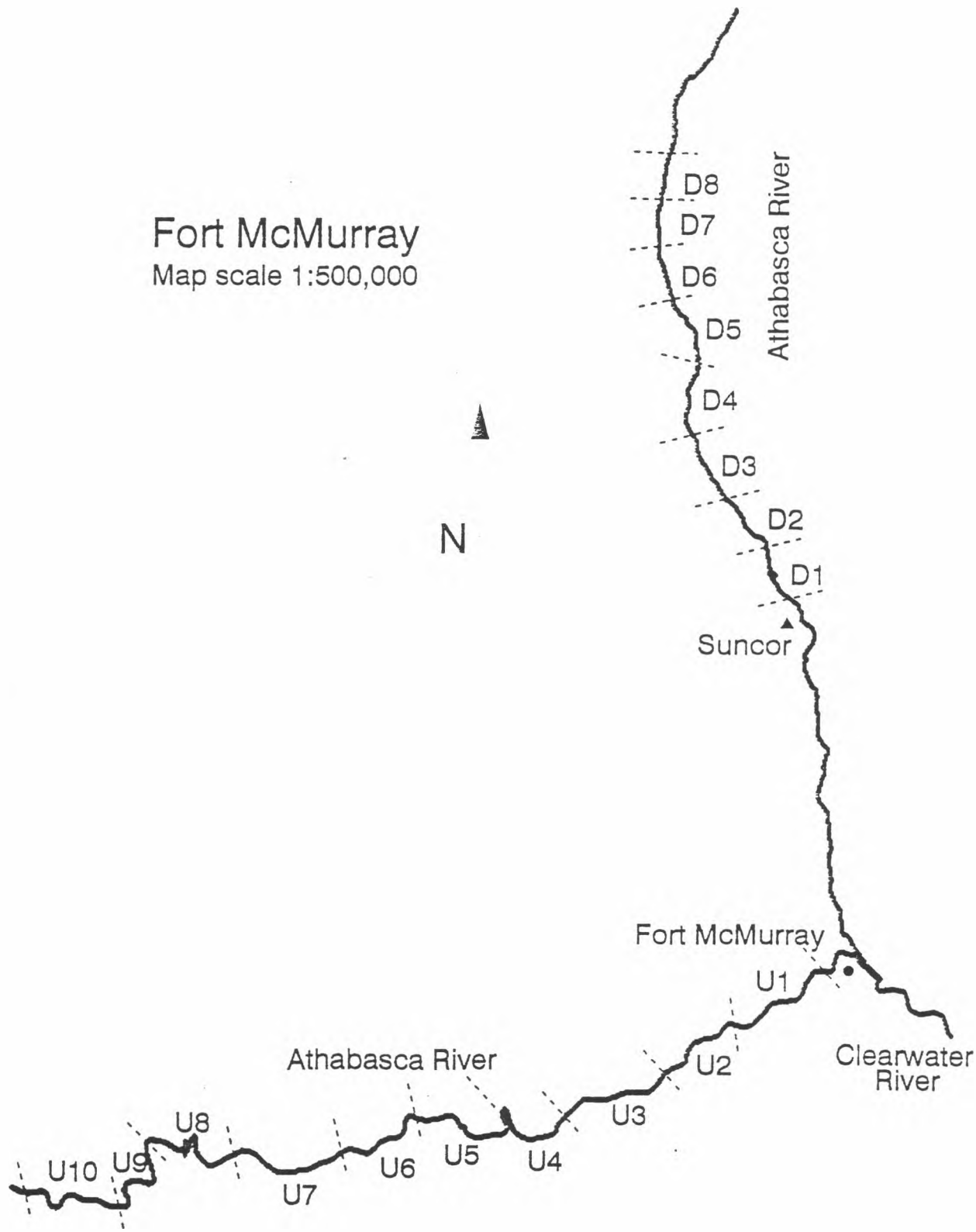

Fig. 3. Detail of Fort McMurray bird survey site.

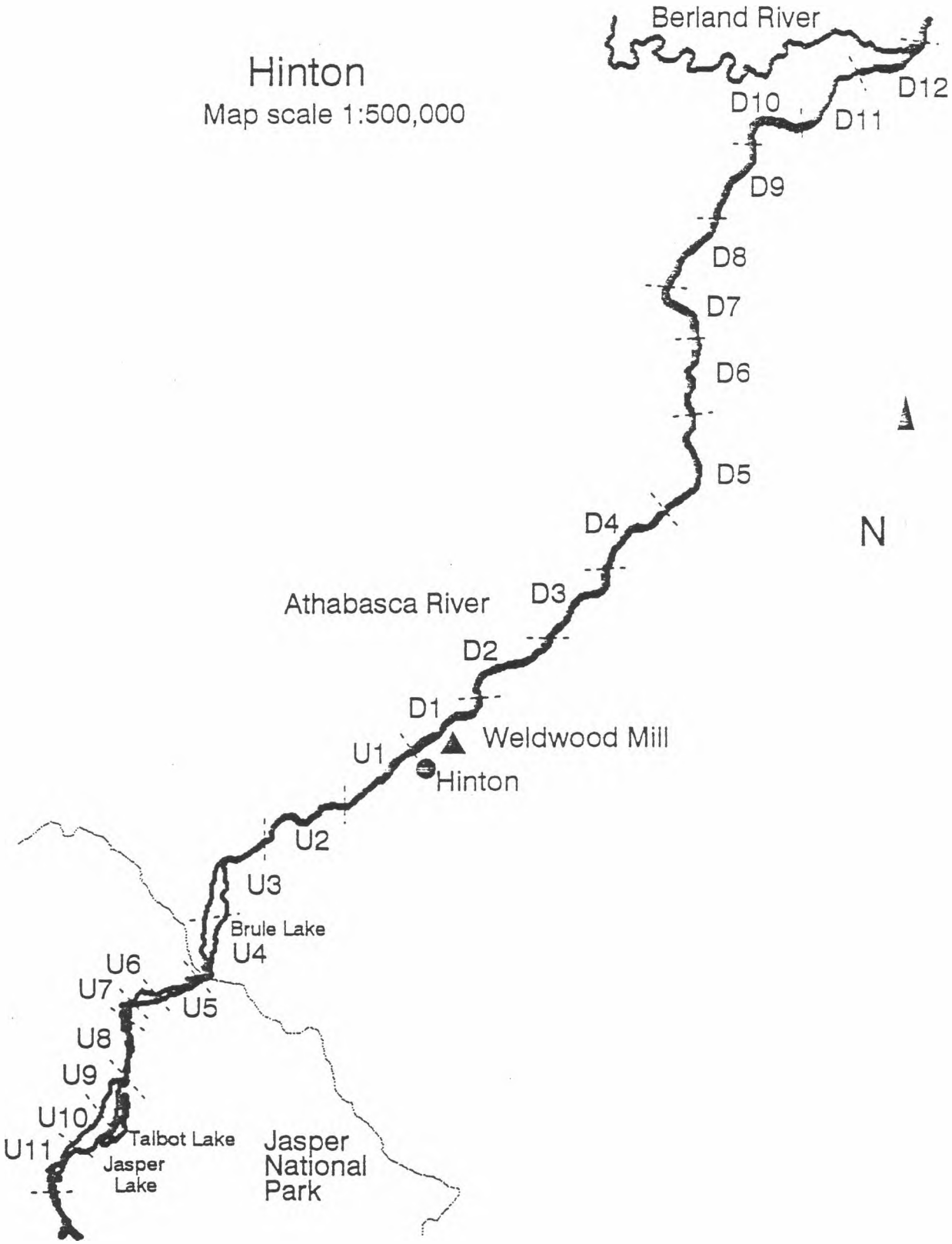

Fig. 4. Detail of Hinton bird survey site.

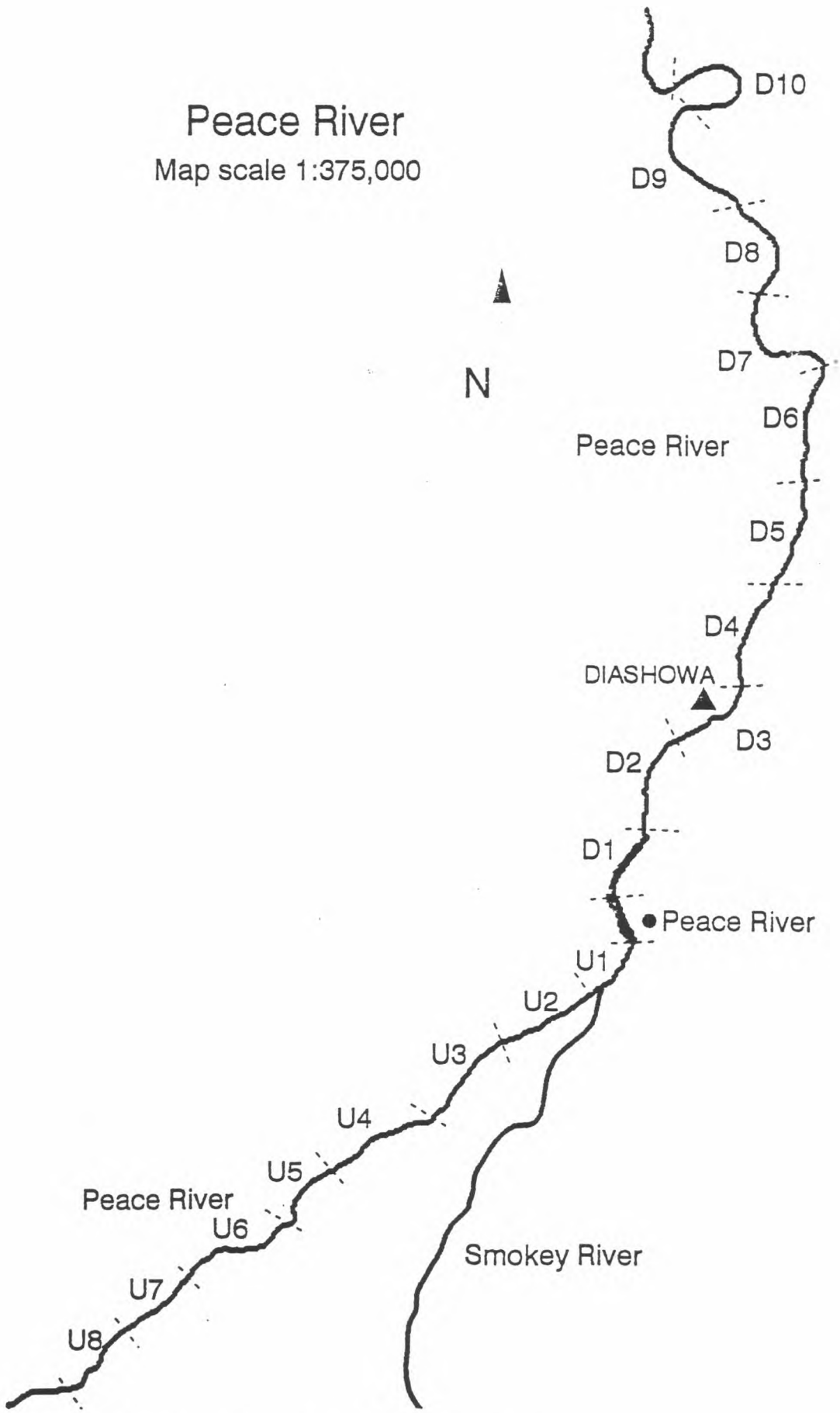

Fig. 5. Detail of Peace River bird survey site.

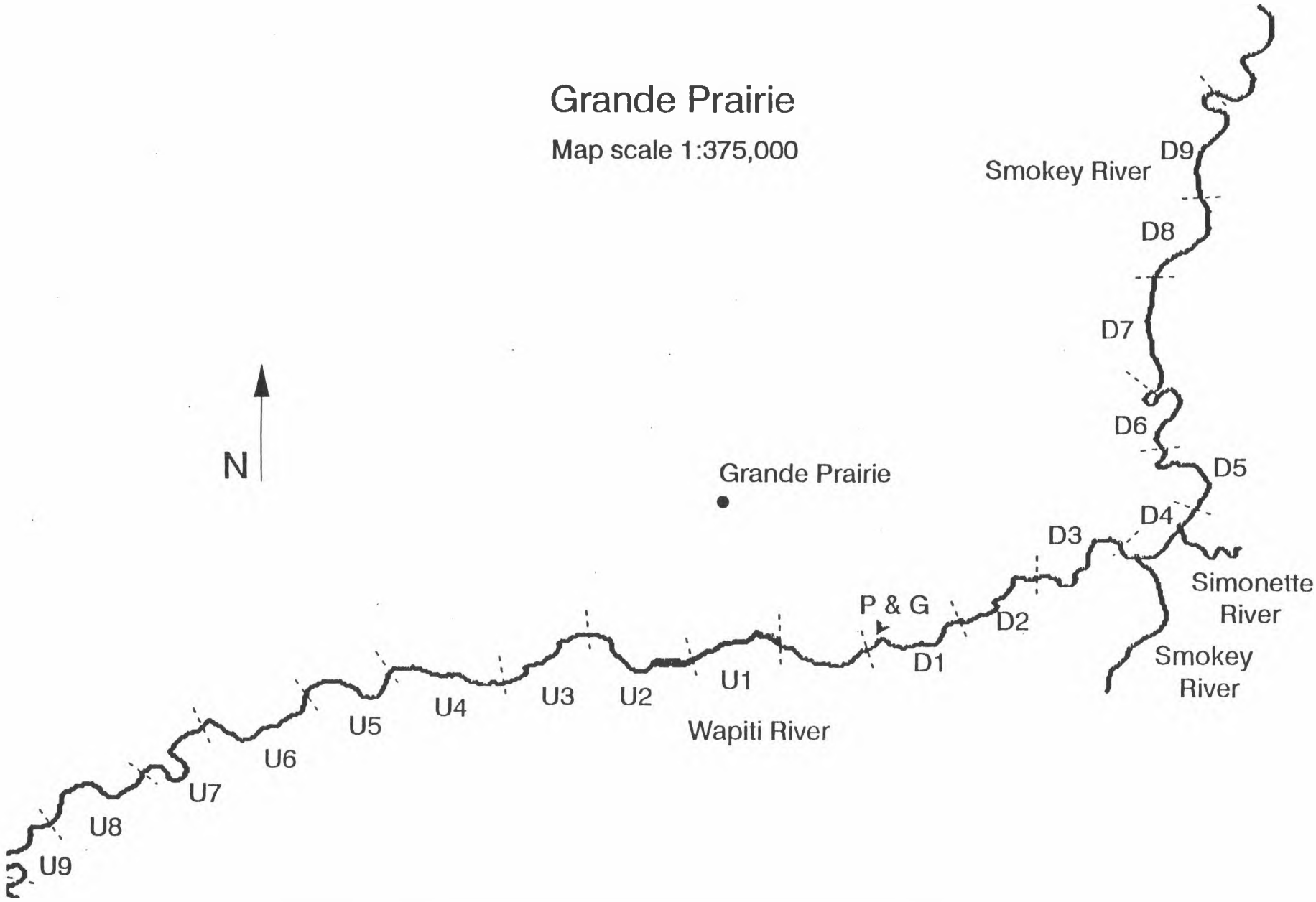

Fig. 6 Detail of Grand Prairie bird survey site.

shoreline length including both banks of the river plus island shoreline; 3) island length defined as the total amount of island shoreline; 4) number of gravelbars or sandbars; 5) total side channel length defined as the length of narrow side or back channels (less than 50 m wide); 6) main channel length; 7) number of rapids; 8) elevation change over a 1 km distance from the midline of the river section, here defined as the mean of this measurment made at three equidistant points along each river section; 9) landscape features within a 5 km radius of the midpoint of each river section, including the surface area (km^2) of forested, agricultural and industrial/municipal land, and lake/wetland and bog/muskeg. These data are presented in Appendix 14. We used stepwise multiple regression (PROC STEPWISE, SAS Institute Inc. 1985) to determine which of these factors, if any, influenced total bird abundance and total number of bird species per section of river.

In the P-A delta, surveys were planned based on twelve hours of flying time, 4 of which were paid for by PARKS CANADA. Of the 12 hours, approximately 1.5 consisted of ferrying time. In planning the P-A delta surveys, it was anticipated that approximately 1200 km of shoreline would be flown at 100 - 120 km per hour. Survey routes were selected in part based on previous survey work (Nieman and Dirshl 1973) and in part based on the proximity of basins to the Peace and Athabasca Rivers from which flood waters and associated sediments would originate (Fig. 7). Within Wood Buffalo National Park, survey routes were mapped on 1:100,000 Landsat Multispectral Scanner images (Jaques 1990) which were taken during summer, 1989. Within the Chipewyan Reserve, routes were mapped on a 1:250,000 topographic map. Because of the dynamic hydrology of the P-A delta, substantial error in shoreline measurements probably occurred because current (summer 1992) images were not available for measuring shoreline lengths. Nevertheless, our overall impression was that major wetland basins depicted on the map and Landsat images corresponded closely with, but were somewhat smaller than what we saw from the air. The one major exception was Hilda Lake which appeared to form one continuous

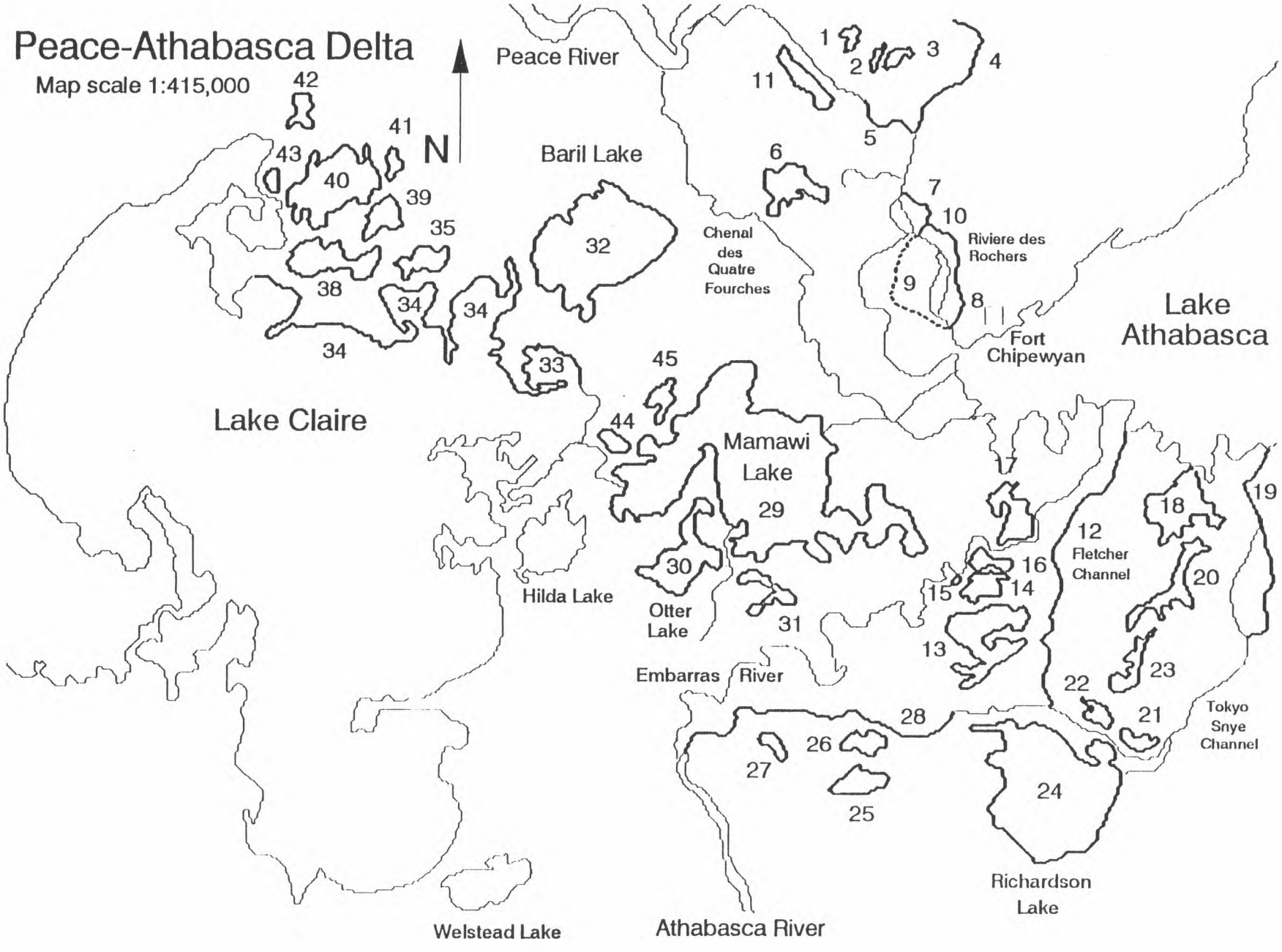

Fig. 7. Detail of Peace-Athabasca delta survey site.

basin with lake Claire.

Surveys in the P-A delta were flown over approximately 940 km of shoreline with a STOL-equipped Cessna 185 at an elevation of 50 m and a flight speed of 100 to 120 km per hour. With the exception of the pilot, the survey crew was the same as for the mainstem river surveys. Portions of major waterbodies were surveyed on July 7-8 in the morning and early afternoon.

In summarizing the data from the P-A delta, the bird data were tabulated for each major basin surveyed (see Fig. 7) and according to the three categories of flooding regimes (Jaques 1989). According to this classification, open drainage basins include the major lakes of the P-A delta which are continuously flooded, restricted drainage basins are those that are flooded by moderate to high flooding regimes while extremely restricted basins are those that are flooded only by the most severe floods. The reasons for classifying basins according to their flooding regimes were two-fold: first, because ceratin species appear to prefer one type of basin over another (Nieman and Dirschl 1973) and second, because it is possible that patterns of sediment deposition, and hence contaminants deposition differ according to basin type. We tested for differences in bird density (no. birds per km shoreline) among these three drainage categories using one-way ANOVA (PROC GLM, SAS Institute Inc. 1985).

For the P-A delta, data have been coded in much the same way as on the mainstem rivers, the one exception being that total numbers of birds of a given species, social status and habitat zone have been entered for each of the 43 basins (numbered 1 - 34 and 37 - 45) (see Appendix 15). Summaries of this data have been tabulated for each species according to its social status and age on each of the 43 waterbasins.

In addition to the aerial surveys, we also attempted to tap local or traditional knowledge of bird distributions and abundances on these rivers. This was done through contacts with Alberta Fish and Wildlife personnel in several district offices, personnel working for consulting firms that often do river work, jet boat operators, local bird enthusiasts and Parks Canada personnel in

Wood Buffalo National Park and anyone else who was identified as a potential contact. The following individuals provided information:

Richard Chabaylo - DA Westworth
Rick Pattenden - RL&L
Jacques van Pelt - Fort Smith
Chuck Graves - Fort McMurray
Stella Swanson - Sentar
Willie Courtorielle - Wood Buffalo National Park
Dave Moore - Alberta Fish and Wildlife
Dan Holt - Athabasca
Ben Gadd - Hinton
Jerry Wilde - Hinton

In some instances, we had the opportunity to verify their claims.

3.0 RESULTS

3.1 Mainstem River Surveys

We surveyed 1720 km of shoreline during 10 aerial surveys at five mainstem river sites (Table 1). Weather conditions were ideal and provided excellent visibility for 9 of the 10 surveys (Table 1).

We observed 35 species of birds during the 10 mainstem river surveys (Table 2; most sandpipers and gulls could not be identified to species, and were recorded as "unidentified sandpiper" and "unidentified gull"). Waterfowl (ducks and geese) comprised roughly a third of the species total (n = 12 species) and raptors (eagles, hawks and owls) comprised one fifth (n = 7). Species richness (i.e. total number of species) was highest up and downstream from Peace River and Hinton; the fewest species were detected downstream from Athabasca and upstream from Grande Prairie (Table 2). Species richness did not differ between upstream and downstream sites (t = 0.36, P = 0.72). Two habitat variables had significant effects on the number of species observed: species number increased with average river width (partial r^2 = 0.06, F = 6.42, P = 0.01) and with proportion of agricultural land-use within a 5 km radius (partial r^2 = 0.05, F = 5.00, P = 0.03). Species

Table 1. Survey distance (km of shoreline), phenology, timing, weather and visibility conditions of aerial surveys of the Peace-Athabasca Rivers, 1992.

Location	Site	Km	Date	Time (min)	°C	Wind	Cloud cover	Visibility
Athabasca	Upstream	120	30 June	0800-0930 (90)	10	Calm	60	Excellent
Athabasca	Downstream	120	30 June	0600-0740 (100)	15	Calm	60	Excellent
Fort McMurray	Upstream	200	1 July	0618-0816 (118)	15	Calm	70	Excellent
Fort McMurray	Downstream	160	1 July	0845-1047 (122)	15	Calm	0	Excellent
Hinton	Upstream	220	3 July	0610-0745 (95)	6	Calm	100	Excellent
Hinton	Downstream	240	3 July	0810-1015 (125)	12	Calm	100	Fair
Grande Prairie	Upstream	160	4 July	1111-1303 (112)	18	Calm	0	Excellent
Grande Prairie	Downstream	160	4 July	1330-1516 (106)	20	Calm	0	Excellent
Peace River	Upstream	160	5 July	0615-0803 (108)	14	Calm	0	Excellent
Peace River	Downstream	180	5 July	0840-1055 (135)	18	Calm	0	Excellent

Table 2. Numbers of adult and fledged juvenile birds observed during aerial surveys of five sites on the Peace and Athabasca River systems.

Common name	Athabasca		Hinton		Ft. McMurray		Peace River		Grand Prairie		Totals	
	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Common Loon	0	0	15	0	0	0	0	0	0	0	15	0
Red-necked Grebe	0	0	4	0	0	0	0	0	0	0	4	0
American White Pelican	40	0	0	0	0	0	0	0	0	0	40	0
Double-crested Cormorant	0	0	0	5	0	0	0	0	0	0	0	5
Great Blue Heron	7	0	0	3	4	0	0	0	0	0	11	3
Canada Goose	13	5	42	24	17	2	14	19	12	4	98	54
Mallard	19	33	85	6	1	74	23	56	1	12	129	181
Gadwall	0	0	0	0	0	0	6	0	0	0	6	0
Green-winged Teal	0	0	0	0	0	2	0	0	0	0	0	2
American Wigeon	0	4	0	0	0	101	5	2	0	1	5	109
Northern Pintail	0	1	0	0	0	0	0	0	0	0	0	1
Northern Shoveler	0	0	1	8	10	0	0	9	0	0	11	17
Blue-winged Teal	4	0	0	3	0	0	0	0	0	0	4	3
Lesser Scaup	0	0	0	0	0	3	12	4	0	0	12	7
Common Goldeneye	35	43	58	6	1	29	9	34	0	0	103	112
Bufflehead	0	0	1	0	0	0	6	1	0	0	7	1
Common Merganser	3	9	9	12	0	0	5	14	16	13	33	48
Unidentified duck	0	1	1	0	0	2	2	0	0	0	3	3
Killdeer	0	0	0	2	0	1	0	6	1	4	1	13
Lesser Yellowlegs	0	0	1	1	0	0	0	0	0	4	1	5
Unidentified sandpiper	4	9	1	9	28	19	16	50	15	24	64	111
Franklin's Gull	0	0	0	0	0	0	0	0	0	2	0	2
Unidentified gull	1	2	9	0	4	2	12	80	120	22	146	106
Black Tern	0	0	0	0	0	0	0	0	0	6	0	6
Bald Eagle	11	4	4	1	1	1	2	3	0	2	18	11
Northern Harrier	0	0	0	0	0	0	0	1	0	0	0	1
Sharp-shinned Hawk	0	0	0	0	0	0	1	0	0	0	1	0
Red-tailed Hawk	0	0	0	3	0	1	2	0	5	3	7	7
Osprey	1	0	3	0	0	1	0	1	0	0	4	2
American Kestrel	0	0	0	0	0	0	1	1	1	0	2	1
Merlin	0	0	0	0	0	1	2	0	0	0	2	1

Table 2: continued, next page.

Table 2: concluded.

Common name	Athabasca		Hinton		Ft. McMurray		Peace River		Grand Prairie		Totals	
	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
Great Horned Owl	0	0	0	0	1	1	1	0	0	0	2	1
Belted Kingfisher	0	0	0	0	0	0	0	0	0	1	0	1
Black-billed Magpie	0	0	6	0	0	0	2	0	0	0	8	0
American Crow	0	0	4	2	2	0	0	0	0	0	6	2
Common Raven	0	0	3	14	1	0	1	5	0	2	5	21
Total dabbling ducks	23	38	86	17	11	177	34	67	1	13	155	312
Total diving ducks	38	52	68	18	1	32	32	53	16	13	155	168
Total waterfowl	74	96	197	59	29	213	82	139	29	30	411	537
Total shorebirds	4	9	2	12	28	20	16	56	16	32	66	129
Total gulls	1	2	9	0	4	2	12	80	120	24	146	108
Total raptors	12	4	7	4	2	5	9	6	6	5	36	24
Total corvids	0	0	13	16	3	0	3	5	0	2	19	23
Total birds	138	111	247	99	70	240	122	286	171	100	648	836
Total species[a]	11	9	16	15	11	14	18	16	8	14	28	29

[a] Total species includes unidentified gull and unidentified sandpiper, but excludes unidentified duck.

detected at all five locations included Canada Geese, Mallards, unidentified sandpipers, unidentified gulls, and Bald Eagles (see Appendix 1 for scientific names). Species detected at 4 of the 5 locations included Common Goldeneyes, Common Mergansers, Killdeers, Red-tailed Hawks, Ospreys, and Common Ravens.

We observed a total of 1584 adult and fledged juvenile birds during the 10 aerial surveys (0.863 birds per km of shoreline). The greatest numbers of birds occurred on the Peace River downstream survey (286), the Hinton upstream survey (247), and the Fort McMurray downstream survey (240). The least number of birds were observed on the Fort McMurray upstream survey (70), the Hinton downstream survey (99), and the Grande Prairie downstream survey (100). Neither the number nor the density of birds observed per survey differed between upstream and downstream sites (t = 0.36, P = 0.73; t = 0.27, P = 0.81, respectively). The number of birds detected per section of river was significantly related to two habitat variables: average river width (partial r^2 = 0.07, F = 8.18, P = 0.006) and proportion of industrial land-use within a 5 km radius (partial r^2 = 0.16, F = 14.73, P = 0.0002). Waterfowl comprised 64% of the total birds, gulls 17%, and shorebirds 13%. The 5 most abundant birds, in decreasing order, were Mallards (310 total birds), unidentified gulls (252), unidentified sandpipers (252), Common Goldeneyes (215) and Canada Geese (152).

Pre-fledged birds, including waterfowl broods and raptor chicks were extremely rare on the stretches of rivers that we surveyed. Pre-fledged birds that we encountered most frequently were Canada geese (196 birds), followed by mallards (98 birds) and Common mergansers (58 birds). Canada goose goslings were seen at all but the downstream portion of the Fort McMurray site; mallard ducklings were seen at all locations except for upstream at Athabasca, Fort McMurray and Grand Prairie; most of the common merganser ducklings were seen at the Grand Prairie site (Table 3). Among fish-eating, raptorial species, Only 2 Osprey nests were seen; they were upstream from Hinton in Jasper National Park; four Bald eagle nests were seen: one upstream from Hinton on Talbot Lake; another approximately 5 km downstream from the P&G mill on

Table 3. Numbers of pre-fledged birds observed during aerial surveys of five sites on the Peace and Athabasca River systems and on the P.-A. Delta[a].

Common name	Athabasca		Hinton		Ft. McMurray		Peace River		Grand Prairie		P-A Delta
	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Total
Common Loon	0	0	3	0	0	0	0	0	0	0	0
Canada Goose	40	10	13	24	0	0	0	0	0	0	20
Mallard	0	5	36	20	13	15	24	44	24	8	154
Gadwall	0	0	0	0	0	0	4	7	0	7	14
Green-winged Teal	0	0	0	0	0	0	0	0	0	0	14
American Wigeon	0	0	0	0	0	7	11	0	0	7	37
Blue-winged Teal	0	0	0	0	0	0	0	0	0	0	14
Canvasback	0	0	0	0	0	0	0	0	0	0	14
Ring-necked Duck	0	0	0	0	0	0	0	0	0	0	7
Lesser Scaup	0	0	0	0	0	0	0	0	0	0	28
Common Goldeneye	7	4	15	0	0	0	0	0	0	0	7
Bufflehead	0	0	6	0	0	0	0	0	0	0	7
Common Merganser	0	2	0	9	0	0	0	0	41	6	0
Unidentified duck	0	0	0	0	0	0	0	0	0	0	70
American Coot	0	0	0	0	0	0	0	0	0	0	63
Bald Eagle	0	0	*1	0	0	0	*1	0	0	2	1
Osprey	0	0	*2	0	0	0	0	0	0	0	0
Common Raven	0	0	0	*1	0	0	0	0	0	0	0

[a] A mean brood size of 7 was assumed for any duck or coot brood for which an accurate total count was not obtained.
* Denotes the number of active nests observed during the survey.

the Wapiti and two on the Peace River, one up and one downstream from the town of Peace River (Table 3).

3.2 Peace-Athabasca Delta Survey

We surveyed 939.9 km of shoreline along 43 lake and river segments in the Peace-Athabasca Delta. The survey was done between 08:05 and 16:35 on 7 July and between 07:05 and 11:00 on July 8, 1992. Weather conditions were variable during the survey period, but visibility remained excellent throughout the entire survey (Table 4).

We observed 32 species of birds on the Peace-Athabasca Delta (Table 4). Waterfowl comprised nearly half of the species total (n = 15 species) and were present on all 43 lake or river segments that we surveyed. On average, each survey segment supported 10.3 bird species, but this ranged from a low of 1 to a high of 22. Some of the variation in number of species detected per survey segment was related to length of shoreline (r = 0.39, P = 0.009); larger lakes or rivers had more species of birds. Mallards occurred on 36 survey segments, Lesser Scaup on 34, American Wigeon on 32, American Coots on 29, and Black Terns on 28.

We counted a total of 23,587 adult and fledged juvenile birds on the P-A Delta (Table 5), or 25.1 birds per survey km. The average count per survey segment was 549 (SD = 936), and the range was 4 to 4128. Much of the among-segment variation in total number of birds was related to shoreline length (r = 0.55, P =0.0001); larger lakes or rivers had more birds. Bird density did not differ between perched basins, intermittently-flooded basins, and freely-flowing basins (ANOVA: $F_{2,39}$ = 1.84, P = 0.17). The most abundant species were American Wigeon (5706 total birds), Mallard (4224), Lesser Scaup (1856), Black Tern (1502), and Franklin's Gull (1292).

We observed low numbers of waterfowl broods on the P-A delta relative to adults (Table 3). The most common species of waterbird broods were mallard, American coot, American widgeon and lesser scaup. Young-of-the-year of fish-eating species were extremely rare. Common merganser young were not seen while Common goldeneye young were rarely seen (Table 3). Among the fish-eating raptorial

Table 4. Survey segment characteristics of the Peace-Athabasca Delta aerial bird survey, 7-8 July 1990.

Segment	Km	Time	°C	Wind	cover	Vis.	Drainage	Water body or location
1	8.3	0805-0827	12	Calm	80	10	Restrict[a]	Dempsey Creek outflow
2	4.8	0805-0827	12	Calm	80	10	Restrict	NE of Egg Lake
3	6.8	0805-0827	12	Calm	80	10	Restrict	NE of Egg Lake
4	32.0	0805-0827	12	Calm	80	10	Free-flow	Riviere des Rochers
5	21.0	0805-0827	12	Calm	80	10	Free-flow	Revillon Coupe
6	25.8	0805-0827	12	Calm	80	10	Ext. Restrict[b]	Pushup Lake
7	9.9	0805-0827	12	Calm	80	10	Free-flow	Riviere des Rochers
8	11.5	0805-0827	12	Calm	80	10	Free-flow	Riviere des Rochers
9	9.9	0805-0827	12	Calm	80	10	Free-flow	Riviere des Rochers marsh
10	13.4	0805-0827	12	Calm	80	10	Free-flow	Riviere des Rochers
11	12.9	0805-0827	12	Calm	80	10	Ext. Restrict	Egg Lake
12	59.3	1145-1420	14	Windy	100	10	Free-flow	Fletcher Channel
13	24.3	1145-1420	14	Windy	100	10	Restrict	S of Galoot Lake
14	8.6	1145-1420	14	Windy	100	10	Restrict	S of Galoot Lake
15	2.3	1145-1420	14	Windy	100	10	Ext. Restrict	S of Galoot Lake
16	9.9	1145-1420	14	Windy	100	10	Restrict	S of Galoot Lake
17	43.7	1145-1420	14	Windy	100	10	Restrict	Galoot Lake
18	17.1	1145-1420	14	Windy	100	10	Free-flow	S bay on Lake Athabasca
19	41.9	1145-1420	14	Windy	100	10	Free-flow	Tokyo Snye Channel
20	21.4	1145-1420	14	Windy	100	10	Restrict	Chipewyan Indian Reserve
21	11.9	1145-1420	14	Windy	100	10	Restrict	Frezie Lake
22	18.5	1145-1420	14	Windy	100	10	Restrict	Chipewyan Indian Reserve
23	17.2	1145-1420	14	Windy	100	10	Restrict	Chipewyan Indian Reserve
24	52.1	1145-1420	14	Windy	100	10	Free-flow	Richardson Lake
25	4.9	1145-1420	14	Windy	100	10	Restrict	Blanche Lake
26	18.4	1145-1420	14	Windy	100	10	Restrict	Limon Lake
27	9.6	1145-1420	14	Windy	100	10	Restrict	Dagmar Lake
28	53.2	1145-1420	14	Windy	100	10	Free-flow	Athabasca River
29	108.0	1450-1635	14	Windy	0	10	Free-flow	Mamawi Lake
30	28.4	1450-1635	14	Windy	0	10	Restrict	Otter Lake
31	12.8	1450-1635	14	Windy	0	10	Restrict	Pair Lakes
32	28.9	1450-1635	14	Windy	0	10	Restrict	Baril Lake
33	15.0	1450-1635	14	Windy	0	10	Free-flow	NE bay on Lake Claire
34	63.5	1450-1635	14	Windy	0	10	Free-flow	N shore of Lake Claire
35	8.9	1450-1635	14	Windy	0	10	Restrict	N of Lake Claire
38	28.0	1450-1635	14	Windy	0	10	Restrict	N of Lake Claire
39	0.0	1450-1635	14	Windy	0	10	Free-flow	N of Lake Claire
40	34.1	1450-1635	14	Windy	0	10	Free-flow	N of Lake Claire
41	7.1	1450-1635	14	Windy	0	10	Restrict	N of Lake Claire
42	10.7	1450-1635	14	Windy	0	10	Free-flow	N of Lake Claire
43	7.1	1450-1635	14	Windy	0	10	Free-flow	N of Lake Claire
44	6.5	1450-1635	14	Windy	0	10	Restrict	NW of Mamawi Lake
45	8.8	1450-1635	14	Windy	0	10	Restrict	NW of Mamawi Lake

Table 5. Numbers of adult and fledged juvenile birds observed during aerial surveys of the Peace-Athabasca Delta, 7 July 1992.

Species	Lake or River Segment													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Red-necked Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eared Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pied-billed Grebe	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Unknown grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Am. White Pelican	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Blue Heron	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	0	0	0	0	0	0	9	0	0	0	0	0
Mallard	0	1	1	0	0	5	0	0	8	0	120	0	104	5
Gadwall	0	0	0	0	0	1	0	0	0	0	8	15	50	0
Green-winged Teal	0	0	0	0	0	0	0	0	0	0	0	1	0	0
American Wigeon	0	0	1	0	0	2	2	0	3	0	4	0	170	27
Northern Pintail	0	0	0	0	0	0	0	0	0	0	5	0	0	0
Northern Shoveler	0	0	2	0	0	3	0	0	0	0	4	1	13	0
Blue-winged Teal	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Ruddy Duck	0	4	0	0	0	0	0	0	0	0	0	0	1	1
Canvasback	0	0	0	0	0	0	0	0	0	0	0	0	39	0
Redhead	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Ring-necked Duck	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Lesser Scaup	6	21	13	0	0	84	0	0	37	12	6	0	124	0
Common Goldeneye	0	0	0	6	1	0	0	0	3	1	0	0	0	0
Bufflehead	0	4	0	0	0	3	0	0	2	0	0	0	0	0
Unknown duck	0	0	1	0	3	2	0	1	0	0	26	2	0	0
American Coot	2	19	0	0	0	1	0	0	0	0	1	0	22	7
Greater Yellowlegs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesser Yellowlegs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Franklin's Gull	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Unknown gull	0	0	0	2	0	0	0	2	0	0	0	12	0	0
Common Tern	0	0	0	0	0	0	2	0	0	0	0	12	1	0
Black Tern	20	21	1	0	0	15	0	0	0	0	0	13	6	1
Bald Eagle	0	0	0	0	0	0	1	1	0	0	0	2	0	0
Northern Harrier	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Red-tailed Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Horned Owl	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 5: continued, page 2 of 6.

	Lake or River Segment													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total species	3	6	5	2	1	10	3	2	6	2	9	9	13	5
Total birds	28	70	19	8	4	118	5	4	62	13	176	50	533	41

Species	Lake or River Segment 15	16	17	18	19	20	21	22	23	24	25	26	27	28
Red-necked Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eared Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pied-billed Grebe	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Unknown grebe	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Am. White Pelican	0	0	0	0	0	0	0	0	0	7	0	2	0	0
Great Blue Heron	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	0	0	0	0	0	0	0	27	0	0	21	0
Mallard	1	12	10	18	12	98	27	4	12	134	1	69	267	2
Gadwall	0	1	2	2	6	4	1	0	0	11	0	0	0	0
Green-winged Teal	0	0	0	0	1	0	0	0	0	11	0	0	0	0
American Wigeon	0	2	0	39	52	77	47	1	4	159	12	20	0	0
Northern Pintail	0	0	0	2	0	3	1	0	0	2	0	0	0	0
Northern Shoveler	0	0	2	1	0	10	1	0	0	7	0	0	0	3
Blue-winged Teal	3	1	0	4	0	1	0	0	0	4	0	6	0	0
Ruddy Duck	0	1	0	0	0	5	79	0	6	0	0	0	0	0
Canvasback	0	0	0	2	0	6	1	0	1	59	0	0	0	0
Redhead	0	0	0	1	0	5	0	1	0	0	0	2	0	0
Ring-necked Duck	0	0	0	0	0	12	0	3	2	2	0	0	0	0
Lesser Scaup	0	4	2	8	0	95	4	11	1	395	62	27	2	0
Common Goldeneye	0	0	0	0	0	0	0	0	0	7	3	3	0	0
Bufflehead	0	0	2	0	0	0	0	0	0	1	0	0	0	0
Unknown duck	0	0	0	0	0	1	8	0	1	288	1	0	1	5
American Coot	1	1	0	0	1	19	7	11	11	13	5	0	0	0
Greater Yellowlegs	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Lesser Yellowlegs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Franklin's Gull	0	0	0	0	0	8	775	0	2	155	0	1	0	0
Unknown gull	0	0	0	2	2	5	0	0	1	62	0	5	0	1
Common Tern	0	0	0	0	0	9	20	0	0	2	0	0	0	1
Black Tern	0	0	0	0	2	32	77	15	54	47	0	166	0	2
Bald Eagle	0	0	0	0	0	0	0	0	0	3	0	1	2	0
Northern Harrier	0	0	0	0	0	0	1	0	0	1	0	0	0	0
Red-tailed Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Great Horned Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 5: continued, page 4 of 6.

	Lake or River Segment													
	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total Species	3	7	5	10	7	16	15	7	10	21	6	11	4	6
Total Birds	5	22	18	79	76	390	1053	46	95	1397	85	302	293	15

Table 5: continued, page 5 of 6.

Species	Lake or River Segment														
	29	30	31	32	33	34	35	38	39	40	41	42	43	44	45
Red-necked Grebe	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0
Eared Grebe	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Pied-billed Grebe	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Unknown grebe	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0
Am. White Pelican	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Blue Heron	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Mallard	751	808	135	23	163	372	87	153	132	135	199	7	4	153	195
Gadwall	54	42	3	3	34	352	32	149	6	60	0	0	5	62	32
Green-winged Teal	1	4	2	0	0	3	0	0	0	0	0	0	0	0	0
American Wigeon	178	1204	40	94	223	2158	62	96	201	712	22	2	1	55	36
Northern Pintail	133	150	3	0	43	36	37	57	41	0	33	0	3	0	1
Northern Shoveler	191	196	18	2	0	133	36	23	31	46	29	0	21	0	23
Blue-winged Teal	91	61	13	2	3	25	6	27	25	0	31	1	4	13	64
Ruddy Duck	0	3	3	4	1	4	0	2	7	17	4	0	2	2	2
Canvasback	368	1	0	2	20	44	10	38	2	88	0	0	12	0	5
Redhead	5	4	1	3	1	25	4	14	12	0	9	0	0	2	0
Ring-necked Duck	6	2	0	2	0	6	0	8	5	15	1	0	2	0	2
Lesser Scaup	298	64	24	12	99	117	18	53	34	27	2	20	125	7	42
Common Goldeneye	71	20	9	4	14	37	2	4	24	0	0	0	1	0	0
Bufflehead	2	30	1	0	1	5	0	0	0	0	0	0	1	0	0
Unknown duck	342	335	7	18	6	600	20	697	130	512	0	125	41	90	70
American Coot	88	214	28	24	18	81	45	89	114	78	105	0	7	57	40
Greater Yellowlegs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesser Yellowlegs	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Franklin's Gull	198	0	0	1	0	1	0	140	10	0	0	0	0	0	0
Unknown gull	12	0	0	4	0	4	2	5	4	1	0	0	0	0	0
Common Tern	0	0	4	24	17	11	0	13	12	12	0	1	1	0	0
Black Tern	127	297	161	25	64	105	33	98	50	0	70	0	53	57	55
Bald Eagle	1	1	0	0	0	0	1	0	0	1	0	1	0	0	0
Northern Harrier	4	0	1	0	2	2	1	0	0	2	0	0	0	3	0
Red-tailed Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Horned Owl	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Common Raven	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0

Table 5: concluded, page 6 of 6.

	Lake or River Segment														
	29	30	31	32	33	34	35	38	39	40	41	42	43	44	45
Total species	22	22	19	17	15	22	15	18	17	15	11	7	15	11	13
Total birds	2967	3443	461	248	709	4128	396	1666	840	1707	505	157	283	503	567

species, Osprey young were not seen and only two active bald eagle nests were seen, one on Limon lake and another on basin No. 42 at the north end of Lake Claire.

3.3 TRADITIONAL OR LOCAL KNOWLEDGE

We obtained additional information from our contacts with regional Fish and Wildlife personnel, Parks Canada personnel, naturalists and birding enthusiasts, jet boaters and employees of consulting firms working on the rivers. Most of this information was related to large, conspicuous species. The information they provided is listed below:

1) a breeding colony of White pelicans on the Slave River just above Fort Smith at a site known as Mountain Rapids which produces @ 100 fledged young from 100 to 150 nests annually.

2) Two Great-blue heron colonies, one on the Athabasca River which has been inactive since 1988 or 1989, and another on the Birch River delta portion of the P-A delta. The latter heronry is apparently still active.

3) Osprey nests in Jasper National Park: i) on the eastern Park boundary on the Athabasca River near the Brule Tunnel; ii) on Talbot Lake; iii) on the Athabasca River just below the townsite of Jasper opposite a graveyard; iv) on Medicine Lake about 20 km from the Athabasca River in Jasper National Park. During our surveys, we confirmed sites (i) and (ii). We did not survey the other sites.

4) Bald eagle nests near the following sites: i) confluence of the Athabasca and La Biche Rivers; ii) upstream from Pelican Rapids on the Athabasca River; iii) near the junction of the 20th baseline and the Athabasca River (Latitude 5538 Longitude 11247); iv) directly opposite Duncan Creek on the Athabasca River; v) approximately 5 km downstream from the confluence of the Lesser

Slave and Athabasca Rivers; vi) on the Wapiti River @ 5 km downstream from the pulp mill site; vii) on the Wapiti River near its confluence with the Narraway upstream from Grand Prairie viii) on the Peace River 2 km west of the Dunvegan Bridge (Latitude 5555 Longitude 11833); ix) at Many Islands on the Peace River (Latitude 5618 Longitude 11910); x) Notikewin Provincial Park on the Peace River (Latitude 5715 Longitude 11705); xi) two nests on the Birch River approximately 20 km upstream from the Birch River delta on Lake Claire of the P-A delta; xii) Birch River Delta area of Lake Claire on the P-A delta; xiii) Sweetgrass Creek at the north end of Lake Claire on the P-A delta; xiv) Lousy Creek on the north end of Lake Claire on the P-A delta; xv) two nests on the Gull River at the southeastern corner of Lake Claire on the P-A delta; xvi) Frog Creek near the southeast corner of Lake Claire on the P-A delta; xvii) Big Point on Lake Mamawi off the mouth of the Prairie River on the P-A delta and xviii) near the confluence of the Athabasca and Embarras Rivers near the Athabasca Delta. During our surveys, we confirmed site (vi) but did not observe nests at sites (i) and (xvii). The other sites were not included in our surveys. However, during subsequent work on the Peace and Athabasca Rivers, M.W. observed nests at sites (iv) and (viii).

5) Common tern nesting colony in Lake Claire on the P-A delta at a site locally known as God's Island. We were unable to confirm the presence of tern chicks during our surveys but have subsequently learned from Parks Canada personnel that tern chicks were produced at this site in 1992.

4.0 DISCUSSION

4.1 Mainstem River Surveys

Few species of birds were observed along the mainstem rivers. Although we surveyed over 1700 km of mainstem river shoreline, we only detected 35 species. The mean number of species per 10 km section of river was only 3.9 (SD = 2.0, range 0 to 9). Although the overall number of bird species was fairly low, those species that were present were usually found throughout the river system.

The most commonly detected birds were "unidentified sandpiper" (51/87 river sections), Common Goldeneye (40 sections), Mallard (39 sections), Common Merganser (29 sections), "unidentified gull" (29 sections), Canada Goose (24 sections), and Bald Eagle (18 sections). Sandpipers and gulls are almost impossible to identify from a moving aircraft, but the species represented by "unidentified sandpipers" and "unidentified gulls" were most likely Spotted Sandpipers (Actitis macularia), Solitary Sandpipers (Tringa solitaria), Lesser Yellowlegs (T. flavipes), and California Gulls (L. californicus) (Munson et al. 1980).

The total number of species detected per 10 km section of river was positively correlated with average river width and proportion of agricultural land-use within a 5 km radius. More species were probably found in wide river sections because flow rates were slower, but we lack data on flow rates to directly test this hypothesis. The increase in species numbers near agricultural areas was due to a greater preponderance of Canada Geese and dabbling ducks, which likely resulted from the tendency of these species to feed in agricultural fields. No other habitat variables affected avian species richness.

In addition to the low number of species, relatively few individual birds were observed on the mainstem river sites (< 1 bird/km). Although birds such as shorebirds would have been difficult to detect from the air, most species that we surveyed were large and conspicuous and should have been easy to observe. This suggests that few birds were detected on the mainstem rivers because few birds were actually present. Total number of birds per river section was positively correlated with average river width, once again suggesting that birds are more abundant in areas with slower flow rates. Bird numbers were also higher near industrial areas (i.e. cities). Inspection of individual species abundances per river section (Appendices 3 - 11) suggested that this effect was due to greater numbers of gulls and Mallards. Waterfowl were the most abundant birds throughout the river systems, and the three most abundant species were Canada Geese, Mallards, and Common Goldeneyes. Unidentified gulls and sandpipers were also fairly

abundant throughout the rivers.

Use of the mainstem rivers by breeding birds and their young was exceedingly low. ..... In particular, fish-eating species occurred in low numbers. Common merganser chicks were present both up and downstream only at the Grand Prairie site. It is possible that this species may be suitable for contaminants monitoring on the Wapiti-Smoky Rivers. However, its scarcity at other sites precludes its usefulness as a species for monitoring throughout these river systems. Broods of other waterfowl species occurred sporadically throughout the river systems. Canada goose goslings and mallard and goldeneye ducklings were scattered throughout these river systems. However, because Canada geese feed primarily on terrestrial vegetation, they would not be effective for monitoring contaminants found in riverine sediments and biota. Mallards and goldeneye, while present on the rivers in early June during the surveys, were not seen very often during river work conducted during early August. It is possible that these species use the rivers as 'highways' during the early brood-rearing period when they are most mobile in order to reach preferred habitat on adjacent ponds and lakes. If true, these species also would not hold much promise for contaminants monitoring on these rivers. Moreover, neither is a fish-eating species; mallards are catholic in their selection of food, feeding on a mix of aquatic and terrestrial invertebrates as well as seeds, making them especially inappropriate for monitoring contaminants that biomagnify through food chains. We encountered a small number of active bald eagle nests during our surveys. Contacts with local people and other biologists suggested that this species may breed in low densities throughout these river basins. If their observations are accurate this species may be suitable for contaminants monitoring on these river systems. This is especially true because bald eagles exist at the top of food chains. They feed their young an array of fish species throughout the summer. Thus the probability that the nestlings accumulate lipophilic contaminants found in aquatic ecosystems is quite high. However, several uncertainties must be addressed before deciding to adopt the bald eagle as a sentinel

species for lipophilic contaminants on these river systems. First, because it would be inappropriate to sacrifice young bald eagles for contaminants monitoring, the utility of blood samples must be assessed, particularly for dioxins and furans which require large tissue samples to acheive reasonable detection limits. This can be done through a review of the appropriate experimental literature dealing with tissue distribution and retention of these compounds. Second, the distribution and abundance of active nests must be determined for larger stretches of these river systems than were surveyed in this study. Nest searches are best done in early spring before leaves start to grow on trees.

4.2 Peace-Athabasca Delta Survey

The Peace-Athabasca Delta supported a large number and a high density of waterfowl species. Although we surveyed only about half as many km of shoreline on the P.-A. Delta as we did on the mainstem river sites, we detected approximately the same number of species (n = 32) and nearly 15 times more birds (25.1 birds/km).

Several species of waterfowl have exhibited large changes in relative abundance since Nieman and Dirschl (1973) surveyed breeding waterfowl in the Peace-Athabasca Delta in 1969 and 1970 (Table 6). American Wigeons have replaced Mallards as the most abundant waterfowl species, and Gadwalls have risen from the least abundant to the third most abundant species of dabbling duck. In the meantime, Green-winged Teal, Northern Pintails, Ring-necked Ducks, and Common Goldeneyes have declined in relative abundance, and Ruddy Ducks and Canada Geese have increased. Most of these changes reflect what has happened to North American waterfowl populations as a whole; i.e., relative declines of Mallards and Northern Pintails (Nudds and Cole 1991) and relative increases in Canada Geese and Gadwalls.

Waterfowl broods were not abundant during our surveys, especially relative to the numbers of adults that we saw. This was probably due, in part, to our survey technique. Broods are easy to overlook when making single passes of a shoreline in a fixed-wing aircraft, especially when observers are concentrating on

Table 6. Relative species composition of waterfowl on the Peace-Athabasca Delta in 1969-70 (Nieman and Dirschl 1973) and in 1992 (this study).

Species:	Nieman & Dirschl 1973 No.	%	This study No.	%	Relative change[a]
Canada Goose	0	0.0	58	0.4	-
Mallard	1200	22.2	4224	26.7	1.2
Gadwall	90	1.7	935	5.9	3.5
Green-winged Teal	302	5.6	23	0.1	0.02
American Wigeon	505	9.3	5706	36.1	3.9
Northern Pintail	980	18.1	550	3.5	0.2
Northern Shoveler	355	6.6	796	5.0	0.8
Blue-winged Teal	105	1.9	387	2.4	1.3
Ruddy Duck	8	0.1	148	0.9	9.0
Canvasback	375	6.9	698	4.4	0.6
Redhead	50	0.9	90	0.6	0.7
Ring-necked Duck	270	5.0	69	0.4	0.08
Lesser Scaup	750	13.9	1856	11.7	0.8
Common Goldeneye	415	7.7	210	1.3	0.2
Bufflehead	10	0.2	51	0.3	1.5
Total birds	5415		15801		
Km surveyed	400.1		939.9		

[a] % species composition in 1992 divided by % species composition in 1969-70.

identifying and counting large rafts of adult ducks that are taking flight as the aircraft approaches them. Nevertheless, sufficient numbers of mallard, American widgeon and lesser scaup broods were seen to warrant their consideration for contaminants monitoring in the P-A delta. However, the feeding habits of the first two species are such that biomagnification of contaminants is unlikely. Lesser scaup broods feed mostly on amphipods, chironomids and snails. Thus, biomagnification of contaminants is more likely in this species than in mallards or widgeon.

Only two active bald eagle nests were seen during the surveys. The low number of nests on the P-A delta is consistent with the findings of a previous study (Boyd 1971), in which only 3 active nests were found during intensive aerial surveys of the P-A delta. However, it contrasts with the high density of eagle nests on Lake Athabasca and the precambrian shield lakes immediately north of Lake Athabasca (Munson et al. 1980). Our findings also are at odds with information obtained from Fort Chipewyan residents who identified several nest locations in the delta. Most of the nests they told us about were not in areas that we surveyed. However, one of the nests was within the survey area but we did not observe it possibly because the leaf canopy obscured it from our view or possibly because the resident's identification of that nest location was inaccurate.

5.0 RECOMMENDATIONS

Although aerial surveys are not appropriate for enumerating all species of birds (e.g. small, inconspicuous shorebirds), they provide a fast and effective means of censusing most species of larger-bodied waterbirds, waterfowl, and raptors. Future aerial surveys of the birds of the Northern River Basins Study Area, utilizing the same methods and study sites as described herein, could provide a reliable means of detecting perturbations to the bird community. We recommend that such surveys should be conducted a minimum of once every 10 years.

The generally low abundance of most species of birds along the

mainstem rivers suggests that directed studies aimed at single species of birds will have substantial problems in obtaining adequate sample sizes. Bird species that may be particularly well-suited for directed studies include Common Mergansers, Common Goldeneyes, sandpipers, gulls, and Bald Eagles, but even these species would require enormous study areas in order to obtain adequate sample sizes. Nevertheless, because Bald Eagle nests are conspicuous and because our survey data and traditional or local knowledge suggest that this species nests throughout these drainage basins, it is conceivable that it might be a suitable species for basinwide contaminants monitoring program. As mentionned earlier, this will depend on the utility of blood samples for detecting levels of trace organochlorine contaminants such as dioxins and furans. We emphasize that this species would be suitable for , at best, basinwide studies because of its low density. Its low density renders it unsuitable for site-specific studies. Canada Geese and Mallards were fairly abundant also, but they probably do most of their feeding from adjacent wetlands and agricultural areas.

For studies aimed at assessing the levels and effects of contaminants at sites far downstream from known point sources of contaminants, the White pelican colony on the Slave River should be considered. These pelicans are known to feed primarily on the river and there is substantial information on their breeding success over the last several years.

Most species of waterfowl were highly abundant on the Peace-Athabasca Delta, and directed studies aimed at young-of-the-year waterfowl or waterbird species in this area would have a higher chance of success. Particularly abundant were Mallards, American Wigeon, Lesser Scaup, American Coots, Black Terns, and Franklin's Gulls. As mentionned, the trophic status of most of these species renders them ineffectual for monitoring programs involving contaminants that biomagnify. The lesser scaup which is an obligate invertebrate-feeder and Black terns and Franklin's gulls which have a wide-ranging diet including emerging insects and fish may be of some use in a contaminants study.

6.0 ACKNOWLEDGMENTS

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Appendix 1. Common names, scientific names, AOU numbers and 4-letter abbreviation codes of birds mentioned in the text and tables.

Common name	Scientific name	AOU	Code
Common Loon	Gavia inner	007.0	COLO
Red-necked Grebe	Podiceps grisegena	002.0	RNGR
Eared Grebe	Podiceps nigricollis	004.0	EAGR
Pied-billed Grebe	Podilymbus podiceps	006.0	PBGR
Unidentified grebe	Podicipedidae	006.1	UNGR
American White Pelican	Pelecanus erythrorhynchos	125.0	AWPE
Double-crested Cormorant	Phalacrocorax auritus	120.0	DCCO
Great Blue Heron	Ardea herodias	194.0	GBHE
Canada Goose	Branta canadensis	172.0	CAGO
Mallard	Anas platyrhynchos	132.0	MALL
Gadwall	Anas strepera	135.0	GADW
Green-winged Teal	Anas crecca	139.0	AGWT
American Wigeon	Anas americana	137.0	AMWI
Northern Pintail	Anas acuta	143.0	NOPI
Northern Shoveler	Anas clypeata	142.0	NOSH
Blue-winged Teal	Anas discors	140.0	BWTE
Ruddy Duck	Oxyura jamaicensis	167.0	RUDU
Canvasback	Aythya valisineria	147.0	CANV
Redhead	Aythya americana	146.0	REDH
Ring-necked Duck	Aythya collaris	150.0	RNDU
Lesser Scaup	Aythya affinis	149.0	LESC
Common Goldeneye	Bucephala clangula	151.0	COGO
Bufflehead	Bucephala albeola	153.0	BUFF
Common Merganser	Mergus merganser	129.0	COME
Unidentified duck	Anatinae	999.0	UNDU
Killdeer	Charadrius vociferus	273.0	KILL
Greater Yellowlegs	Tringa melanoleuca	254.0	GRYE
Lesser Yellowlegs	Tringa flavipes	255.0	LEYE
Unidentified sandpiper	Scolopacidae	246.7	UNSA
Franklin's Gull	Larus pipixcan	059.0	FRGU
Unidentified gull	Larus spp.	053.4	UNGU
Common Tern	Sterna hirundo	070.0	COTE
Black Tern	Chlidonias niger	077.0	BLTE
Bald Eagle	Haliaeetus leucocephalus	352.0	BAEA
Northern Harrier	Circus cyaneus	331.0	NOHA
Sharp-shinned Hawk	Accipiter striatus	332.0	SSHA
Red-tailed Hawk	Buteo jamaicensis	337.0	RTHA
Osprey	Pandion haliaetus	364.0	OSPR
American Kestrel	Falco sparverius	360.0	AMKE
Merlin	Falco columbarius	357.0	MERL
Great Horned Owl	Bubo virginianus	375.0	GHOW
Belted Kingfisher	Ceryle alcyon	390.0	BEKI
Black-billed Magpie	Pica pica	475.0	BBMA
American Crow	Corvus brachyrhynchos	488.0	AMCR
Common Raven	Corvus corax	486.0	CORA

Appendix 2. Descriptions of age, social status and habitat codes used to document bird sightings during aerial surveys of the Peace-Athabasca River systems.

Age codes:

1	Adult
2	Fledged juvenile
3	Pre-fledged juvenile
4	Unknown

Social status:

1	Lone bird
2	Flocked birds
3	Brood-rearing bird
4	Brood
5	Territorial bird
6	Unoccupied nest
7	Occupied nest

Habitat codes (two-digits):

First digit:

1	Shoreline
2	Island
3	Other
4	Open water

Second digit:

1	Conifer
2	Deciduous
3	Sandbar
4	Shrubs
5	Deadfall
6	Cliff
7	Gravelbar
0	Unknown

Appendix 3. Number of adult and fledged juvenile birds observed upstream and downstream from Athabasca, Alberta, 30 June 1992.

Common name:	D1	D2	D3	D4	D5	D6	U1	U2	U3	U4	U5	U6
American White Pelican	0	0	0	0	0	0	0	0	0	0	40	0
Great Blue Heron	0	0	0	0	0	0	3	0	4	0	0	0
Canada Goose	0	5	0	0	0	0	0	1	0	0	12	0
Mallard	9	19	4	0	1	0	5	7	0	0	4	3
American Wigeon	2	0	2	0	0	0	0	0	0	0	0	0
Northern Pintail	1	0	0	0	0	0	0	0	0	0	0	0
Blue-winged Teal	0	0	0	0	0	0	3	0	0	0	1	0
Common Goldeneye	17	3	5	9	4	5	8	11	2	3	8	3
Common Merganser	1	0	1	0	5	2	2	0	1	0	0	0
Unidentified duck	0	1	0	0	0	0	0	0	0	0	0	0
Unidentified sandpiper	4	1	2	1	1	0	1	1	0	1	1	0
Unidentified gull	0	1	1	0	0	0	0	0	0	0	0	1
Bald Eagle	2	1	1	0	0	0	0	1	0	5	3	2
Osprey	0	0	0	0	0	0	0	0	0	0	0	1
Total birds	36	31	16	10	11	7	22	21	7	9	69	10
Total species[a]	7	6	7	2	4	2	6	5	3	3	7	5

[a] Total species includes unidentified gull and unidentified sandpiper, but excludes unidentified duck.

Appendix 4. Number of adult and fledged juvenile birds observed downstream from Hinton, Alberta, 3 July 1992.

Common name:	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12
Double-crested Cormorant	3	2	0	0	0	0	0	0	0	0	0	0
Great Blue Heron	0	0	0	0	1	1	1	0	0	0	0	0
Canada Goose	2	3	0	0	4	0	0	6	2	0	7	0
Mallard	0	0	0	0	0	2	1	0	0	0	2	1
Northern Shoveler	0	0	0	0	8	0	0	0	0	0	0	0
Blue-winged Teal	0	0	0	0	0	3	0	0	0	0	0	0
Common Goldeneye	2	1	2	0	1	0	0	0	0	0	0	0
Common Merganser	0	3	0	7	0	0	0	0	1	0	0	1
Killdeer	1	1	0	0	0	0	0	0	0	0	0	0
Lesser Yellowlegs	1	0	0	0	0	0	0	0	0	0	0	0
Unidentified sandpiper	1	1	0	3	1	1	0	1	0	2	0	0
Bald Eagle	0	0	1	0	0	0	0	0	0	0	0	0
Red-tailed Hawk	0	1	0	0	0	1	0	1	0	0	0	0
American Crow	2	0	0	0	0	0	0	0	0	0	0	0
Common Raven	0	0	0	1	0	0	0	1	8	0	0	4
Total birds	12	12	3	11	15	8	2	9	11	2	9	6
Total species[a]	7	7	2	3	5	5	2	4	3	1	2	3

[a] Total species includes unidentified shorebird.

Appendix 5. Number of adult and fledged juvenile birds observed upstream from Hinton, Alberta, 3 July 1992.

Common name:	U1	U2	U3	U4	U5	U6	U7	U8	U9	U10	U11
Common Loon	0	0	0	0	0	0	0	0	6	7	2
Red-necked Grebe	0	0	0	0	0	0	0	0	4	0	0
Canada Goose	0	0	17	4	0	0	0	0	21	0	0
Mallard	0	0	24	1	1	0	0	0	4	3	52
Northern Shoveler	0	1	0	0	0	0	0	0	0	0	0
Common Goldeneye	1	0	21	2	0	1	3	0	26	1	3
Bufflehead	0	0	0	0	0	0	0	0	0	0	1
Common Merganser	7	1	0	0	0	0	1	0	0	0	0
Unidentified duck	0	0	0	0	0	0	0	0	0	0	1
Lesser Yellowlegs	0	0	0	0	0	0	0	0	0	0	1
Unidentified sandpiper	0	0	0	0	1	0	0	0	0	0	0
Unidentified gull	6	0	2	0	0	0	0	1	0	0	0
Bald Eagle	0	0	0	0	0	0	0	1	1	0	1
Osprey	1	0	0	0	0	0	0	0	1	0	0
Black-billed Magpie	0	0	0	0	0	0	2	0	0	0	5
American Crow	0	0	0	0	0	0	0	0	0	0	3
Common Raven	0	0	0	0	3	0	0	0	0	0	0
Total birds	15	2	64	7	5	1	6	2	63	11	69
Total species[a]	4	2	4	3	3	1	3	2	7	3	8

[a] Total species includes unidentified gull and unidentified sandpiper, but excludes unidentified duck.

Appendix 6. Number of adult and fledged juvenile birds observed downstream from Fort McMurray, Alberta, 1 July 1992.

Common name:	D1	D2	D3	D4	D5	D6	D7	D8
Canada Goose	0	0	2	0	0	0	0	0
Mallard	10	51	0	0	9	1	1	2
Green-winged Teal	0	0	2	0	0	0	0	0
American Wigeon	0	101	0	0	0	0	0	0
Lesser Scaup	3	0	0	0	0	0	0	0
Common Goldeneye	3	0	4	4	4	0	6	8
Unidentified duck	0	0	0	0	2	0	0	0
Killdeer	0	0	0	0	0	0	0	1
Unidentified sandpiper	8	0	4	0	4	2	0	1
Unidentified gull	0	0	2	0	0	0	0	0
Bald Eagle	0	0	0	0	1	0	0	0
Red-tailed Hawk	1	0	0	0	0	0	0	0
Osprey	0	0	0	1	0	0	0	0
Merlin	0	0	1	0	0	0	0	0
Great Horned Owl	0	0	0	0	0	1	0	0
Total birds	25	152	15	5	20	4	7	12
Total species[a]	5	2	6	2	4	3	2	4

[a] Total species includes unidentified gull and unidentified sandpiper, but excludes unidentified duck.

Appendix 7. Number of adult and fledged juvenile birds observed upstream from Fort McMurray, Alberta, 1 July 1992.

Common name:	U1	U2	U3	U4	U5	U6	U7	U8	U9	U10
Great Blue Heron	0	0	0	2	0	1	0	1	0	0
Canada Goose	2	1	3	0	0	0	0	4	7	0
Mallard	0	0	0	0	0	0	0	1	0	0
Northern Shoveler	0	1	0	9	0	0	0	0	0	0
Common Goldeneye	0	0	0	0	0	0	0	1	0	0
Unidentified sandpiper	2	0	2	2	0	2	1	7	12	0
Unidentified gull	2	2	0	0	0	0	0	0	0	0
Bald Eagle	1	0	0	0	0	0	0	0	0	0
Great Horned Owl	0	0	0	0	0	0	0	0	0	1
American Crow	0	0	2	0	0	0	0	0	0	0
Total birds	7	4	7	13	0	3	1	14	19	1
Total species	4	3	3	3	0	2	1	5	2	1

[a] Total species includes unidentified gull and unidentified sandpiper.

Appendix 8. Number of adult and fledged juvenile birds observed downstream from Peace River, Alberta, 5 July 1992.

Common name:	D1	D2	D3	D4	D5	D6	D7	D8	D9
Canada Goose	0	0	0	1	0	20	0	0	0
Mallard	1	41	1	11	0	1	0	1	0
American Wigeon	0	0	0	2	0	0	0	0	0
Northern Shoveler	8	1	0	0	0	0	0	0	0
Lesser Scaup	1	0	0	0	0	0	3	0	0
Common Goldeneye	7	13	3	4	7	0	0	0	0
Bufflehead	0	0	0	0	1	0	0	0	0
Common Merganser	2	0	0	4	0	0	0	6	2
Killdeer	0	4	0	1	0	0	0	0	0
Unidentified sandpiper	0	12	13	6	1	2	3	2	8
Unidentified gull	77	1	0	0	0	2	0	0	0
Bald Eagle	0	0	0	0	0	1	1	0	0
Northern Harrier	0	0	1	0	0	0	0	0	0
Osprey	0	0	0	0	0	0	1	0	0
American Kestrel	1	0	0	0	0	0	0	0	0
Common Raven	1	0	0	0	0	1	0	0	3
Total birds	98	72	18	29	9	27	8	9	13
Total species[a]	8	6	4	7	3	6	4	3	3

[a] Total species includes unidentified gull and unidentified sandpiper.

Appendix 9. Number of adult and fledged juvenile birds observed upstream from Peace River, Alberta, 5 July 1992.

Common name:	U1	U2	U3	U4	U5	U6	U7	U8
Canada Goose	0	0	0	0	0	0	0	16
Mallard	0	2	5	1	0	15	0	0
Gadwall	0	1	0	0	4	0	1	0
American Wigeon	0	1	0	0	0	2	1	1
Lesser Scaup	0	0	11	0	0	0	1	0
Common Goldeneye	3	0	1	3	0	2	0	0
Bufflehead	0	0	5	1	0	0	0	0
Common Merganser	0	0	0	0	2	3	0	0
Unidentified duck	0	0	2	0	0	0	0	0
Unidentified sandpiper	1	0	3	6	2	0	2	2
Unidentified gull	0	1	5	0	0	3	2	1
Bald Eagle	0	0	0	0	1	1	0	0
Sharp-shinned Hawk	0	0	0	0	0	0	0	1
Red-tailed Hawk	0	0	0	0	1	1	0	0
American Kestrel	1	0	0	0	0	0	0	0
Merlin	1	0	0	1	0	0	0	0
Great Horned Owl	0	0	0	0	0	0	1	0
Black-billed Magpie	0	0	2	0	0	0	0	0
Common Raven	0	1	0	0	0	0	0	0
Total birds	6	6	34	12	10	27	8	21
Total species[a]	4	5	7	5	5	7	6	5

[a] Total species includes unidentified gull and unidentified sandpiper, but excludes unidentified duck.

Appendix 10. Number of adult and fledged juvenile birds observed downstream from Grande Prairie, Alberta, 4 July 1992.

Common name:	D1	D2	D3	D4	D5	D6	D7	D8
Canada Goose	0	0	2	0	0	2	0	0
Mallard	5	0	0	6	1	0	0	0
American Wigeon	0	0	1	0	0	0	0	0
Common Merganser	9	1	0	1	1	0	0	0
Killdeer	1	1	2	0	0	0	0	0
Lesser Yellowlegs	2	1	1	0	0	0	0	0
Unidentified sandpiper	9	5	9	0	0	0	0	1
Franklin's Gull	0	0	0	1	1	0	0	0
Unidentified gull	3	1	1	1	10	4	1	1
Black Tern	4	1	1	0	0	0	0	0
Bald Eagle	2	0	0	0	0	0	0	0
Red-tailed Hawk	0	0	1	0	1	1	0	0
Belted Kingfisher	0	0	0	0	0	0	1	0
Common Raven	2	0	0	0	0	0	0	0
Total birds	37	10	18	9	14	7	2	2
Total species[a]	9	6	8	4	4	3	2	2

[a] Total species includes unidentified gull and unidentified sandpiper.

Appendix 11. Number of adult and fledged juvenile birds observed upstream from Grande Prairie, Alberta, 4 July 1992.

Common name:	U1	U2	U3	U4	U5	U6	U7	U8	U9
Canada Goose	0	0	0	12	0	0	0	0	0
Mallard	0	1	0	0	0	0	0	0	0
Common Merganser	0	1	3	2	3	3	4	0	0
Killdeer	0	0	0	1	0	0	0	0	0
Unidentified sandpiper	4	0	8	2	1	0	0	0	0
Unidentified gull	111	0	2	6	0	1	0	0	0
Red-tailed Hawk	0	0	0	0	1	0	2	1	1
American Kestrel	0	1	0	0	0	0	0	0	0
Total birds	115	3	13	23	5	4	6	1	1
Total species[a]	2	3	3	5	3	2	2	1	1

[a] Total species includes unidentified gull and unidentified sandpiper.

Appendix 12. Habitat codes used to describe bird sightings on the Peace-Athabasca Delta.

Code	Description
1	Open water
2	Emergents / Submersed vegetation
3	Mud flats
4	Immature fen
5	Sedge meadow
6	Low shrub
7	Tall shrub
8	Deciduous
9	Coniferous
10	Rock

Source: The Peace-Athabasca Delta Project, Technical Appendices Vol. 2 (1973).

APPENDIX 13. BIRD DATA FOR THE MAINSTEM RIVER SITES (PARSURV.WKQ).

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	BAEA	352	2	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	COGO	151	2	1	2	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	SHOR	246	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	MALL	132	1	1	1	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	SHOR	246	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	COGO	151	4	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	MALL	132	2	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	AMWI	137	2	1	2	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	MALL	132	2	1	2	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	PINT	143	1	1	2	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	COGO	151	1	1	1	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	UNSA	246.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	UNSA	246.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	MALL	132	2	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	COGO	151	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	COME	129	1	1	2	23	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	COGO	151	9	1	2	23	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D1	MALL	132	2	1	2	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	COGO	151	3	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	UNDU	999	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	MAL	132	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	COGO	151	2	3	4	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	UNSA	246.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	MALL	132	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	UNGU	53.4	1	1	1	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	CAGO	172	5	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	CAGO	172	10	3	4	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	BAEA	352	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	MALL	132	2	1	2	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D2	MALL	132	15	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	AMWI	137	2	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	COGO	151	4	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	MALL	132	1	1	3	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	MALL	132	3	3	4	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	COME	129	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	MALL	132	2	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	MALL	132	1	1	3	10	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	MALL	132	2	3	4	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	COGO	151	1	1	1	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	UNSA	246.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	BAEA	352	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	UNSA	246.7	1	1	1	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	COGO	151	2	3	4	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D3	UNGU	53.4	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D4	COGO	151	1	1	1	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D4	UNSA	246.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D4	COGO	151	2	1	2	13	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D4	COGO	151	6	1	2	23	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	COGO	151	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	COME	129	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	UNSA	246.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	COGO	151	3	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	COME	129	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	MALL	132	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	COME	129	1	1	3	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	COME	129	2	3	4	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	COME	129	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D5	COME	129	1	1	1	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D6	COGO	151	2	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D6	COGO	151	1	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D6	COME	129	2	1	2	10	
ATHABASCA	JUNE	30	1992	600	740	15	CALM	60	10	D6	COGO	151	2	1	2	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	BWTE	140	2	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	GBHE	194	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	COGO	151	2	1	2	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	MALL	132	2	1	2	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	BWTE	140	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	GBHE	194	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	MALL	132	2	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	COGO	151	1	1	1	23	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	MALL	132	1	1	1	23	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	COME	129	1	1	1	23	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	COME	129	1	1	1	20	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	COGO	151	4	1	2	20	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	GBHE	194	1	1	1	20	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	UNSA	246.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	COGO	151	1	1	3	13	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U1	COGO	151	4	3	4	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	COGO	151	2	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	MALL	132	3	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	UNSA	246.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	COGO	151	4	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	CAGO	172	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	MALL	132	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	BAEA	352	1	2	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	COGO	151	3	1	2	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	COGO	151	2	1	2	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U2	MALL	132	3	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U3	GBHE	194	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U3	GBHE	194	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U3	COME	129	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U3	COGO	151	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U3	COGO	151	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U3	GBHE	194	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U3	GBHE	194	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U4	BAEA	352	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U4	COGO	151	1	1	1	40	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U4	COGO	151	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U4	BAEA	352	3	2	2	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U4	COGO	151	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U4	UNSA	146.7	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U4	BAEA	352	1	2	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	BAEA	352	1	2	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	BAEA	352	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	BAEA	352	1	2	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	UNSA	246.7	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	BWTE	140	1	1	1	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	COGO	151	3	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	COGO	151	3	3	4	10	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	COGO	151	4	1	2	12	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	CAGO	172	12	1	2	23	QUICK EST.
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	CAGO	172	40	3	4	23	QUICK EST.
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	MALL	132	1	1	1	23	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	WHPE	125	40	1	2	23	NO OBS ON RETURN PASS
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	COGO	151	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	MALL	132	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U5	MALL	132	2	1	2	13	RETURN COULD BE REPEAT
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U6	BAEA	352	1	1	1	12	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U6	BAEA	352	1	2	1	12	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U6	MALL	132	3	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U6	COGO	151	2	1	2	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U6	UNGU	53.4	1	1	1	43	FLYING NOT FLUSHED
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U6	COGO	151	1	1	1	13	
ATHABASCA	JUNE	30	1992	800	930	10	CLAM	60	10	U6	OSPR	364	1	1	1	10	PROB. FLUSHED FROM TREES
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	COGO	151	1	1	1	40	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	UNSA	246.7	3	1	2	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	RTHA	337	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	COGO	151	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	MALL	132	2	1	2	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	MALL	132	7	1	2	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	LESC	149	3	1	2	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	COGO	151	1	1	2	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	MALL	132	1	1	1	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D1	UNSA	246.7	1	1	1	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D2	AMWI	137	100	1	2	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D2	MALL	132	50	1	2	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D2	AMWI	137	7	3	4	25	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D2	AMWI	137	1	1	3	25	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D2	MALL	132	1	1	1	25	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	UNSA	246.7	1	1	1	25	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	UNSA	246.7	1	1	1	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	COGO	151	3	1	2	40	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	UNSA	246.7	1	1	1	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	COGO	151	1	1	1	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	MERL	357	1	1	1	22	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	UNSA	246.7	1	1	1	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	AGWT	139	2	1	2	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	UNGU	53.4	2	1	2	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D3	CAGO	172	2	1	2	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D4	COGO	151	4	1	2	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D4	OSPR	364	1	1	1	40	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	UNDU	999	2	1	2	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	COGO	151	2	1	2	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	COGO	151	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	MALL	132	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	MALL	132	3	1	2	25	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	UNSA	246.7	1	4	1	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	UNSA	246.7	1	4	1	13	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	MALL	132	5	1	2	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	COGO	151	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	BAEA	352	1	1	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	UNSA	246.7	1	4	1	13	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D5	UNSA	246.7	1	4	1	13	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D6	GHOW	375	1	4	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D6	UNSA	246.7	1	4	1	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D6	UNSA	246.7	1	4	1	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D6	MALL	132	1	1	3	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D6	MALL	132	7	3	4	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D7	COGO	151	6	1	2	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D7	MALL	132	1	1	1	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D8	MALL	132	1	1	3	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D8	MALL	132	8	3	4	20	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D8	MALL	132	1	1	1	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D8	KILL	273	1	4	1	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D8	COGO	151	7	1	2	23	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D8	UNSA	246.7	1	4	1	10	
FORT McMURRAY	JULY	1	1992	845	1047	15	CALM	0	10	D8	COGO	151	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U1	UNGU	53.4	1	2	1	40	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U1	UNGU	53.4	1	1	1	40	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U1	UNSA	246.7	1	1	1	13	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U1	BAEA	352	1	1	1	12	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U1	CAGO	172	2	1	2	12	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U1	UNSA	246.7	1	1	1	12	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U2	UNGU	53.4	1	1	1	13	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U2	UNGU	53.4	1	1	1	13	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U2	SHOV	142	1	1	1	43	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U2	CAGO	172	1	1	1	43	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U3	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U3	COCR	488	2	1	2	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U3	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U3	CAGO	172	3	1	3	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U3	CAGO	172	5	3	4	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U4	UNSA	246.7	1	1	1	12	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U4	UNSA	246.7	1	1	1	12	YELLOWLEGS SP.
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U4	GBHE	194	1	1	1	13	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U4	SHOV	142	9	1	2	13	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U4	GBHE	194	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U5			0				NO BIRDS
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U6	GBHE	194	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U6	UNSA	246.7	2	1	2	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U7	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	GBHE	194	1	1	1	40	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	CAGO	172	8	3	4	14	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	CAGO	172	4	1	3	14	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	MALL	132	1	1	1	14	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	UNSA	246.7	3	1	2	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	COGO	151	1	1	1	12	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	UNSA	246.7	1	1	1	12	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U8	UNSA	246.7	1	1	1	10	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U9	CAGO	172	7	1	2	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U9	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U9	UNSA	246.7	2	1	2	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U9	UNSA	246.7	4	1	2	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U9	UNSA	246.7	2	1	2	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U9	UNSA	246.7	2	1	2	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U9	UNSA	246.7	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U10	GHOW	375	1	1	1	10	
FORT McMURRAY	JULY	1	1992	618	816	15	CALM	70	10	U10	CORA	486	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	UNSA	246.7	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	COGO	151	1	1	1	13	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	LEYE	255	1	1	1	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	CAGO	172	2	1	2	23	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	COCR	488	2	1	2	23	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	DCCO	120	2	1	2	23	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	KILL	273	1	1	1	23	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	COGO	151	1	1	1	23	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D1	DCCO	120	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D2	KILL	273	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D2	COME	129	3	1	2	23	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D2	COGO	151	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D2	UNSA	246.7	1	1	1	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D2	CAGO	172	3	1	3	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D2	CAGO	172	5	3	4	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D2	RTHA	337	1	1	1	11	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D2	DCCO	120	2	1	2	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D3	COGO	151	2	1	2	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D3	BAEA	352	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D4	COME	129	3	1	2	13	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D4	UNSA	246.7	1	1	1	13	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D4	UNSA	246.7	1	1	1	13	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D4	COME	129	4	1	2	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D4	CORA	486	1	1	1	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D5	SHOV	142	8	1	2	23	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D5	COGO	151	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D5	CAGO	172	4	1	3	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D5	CAGO	172	2	3	4	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D5	COME	129	9	3	4	23	NO HEN
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D5	GBHE	194	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D5	UNSA	246.7	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D6	UNSA	246.7	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D6	BWTE	140	3	1	2	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D6	GBHE	194	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D6	MALL	132	1	1	1	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D6	RTHA	337	1	1	1	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D6	MALL	132	9	3	4	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D6	MALL	132	1	1	3	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D7	MALL	132	4	3	4	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D7	MALL	132	1	1	3	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D7	GBHE	194	1	1	1	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D8	CAGO	172	6	1	3	23	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D8	CAGO	172	6	3	4	23	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D8	RTHA	337	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D8	CORA	486	1	1	1	10	NEST
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D8	UNSA	246.7	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D9	COME	129	1	1	1	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D9	CORA	486	3	1	2	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D9	CORA	486	5	1	2	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D9	CAGO	172	2	1	3	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D9	CAGO	172	4	3	4	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D10	UNSA	246.7	2	1	2	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D11	CAGO	172	7	1	3	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D11	CAGO	172	7	3	4	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D11	MALL	132	4	3	4	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D11	MALL	132	1	1	3	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D11	MALL	132	3	3	4	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D11	MALL	132	1	1	3	20	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D12	COME	129	1	1	1	20	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D12	CORA	486	4	1	2	10	
HINTON	JULY	3	1992	810	1015	12	CALM	100	5	D12	MALL	132	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U1	UNGU	53.4	4	1	2	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U1	UNGU	53.4	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U1	COME	129	7	1	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U1	UNGU	53.4	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U1	OSPR	364	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U1	COGO	151	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U2	SHOV	142	1	1	1	13	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U2	COME	129	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	COGO	151	2	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	COGO	151	3	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	UNGU	53.4	1	1	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	UNGU	53.4	1	2	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	COGO	151	3	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	MALL	132	24	1	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	COGO	151	10	1	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	COGO	151	2	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	CAGO	172	2	1	3	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	CAGO	172	5	3	4	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	CAGO	172	15	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U3	COGO	151	1	1	1	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U4	CAGO	172	3	1	3	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U4	CAGO	172	1	3	4	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U4	COCR	488	1	1	1	13	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U4	COGO	151	1	1	1	23	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U4	MALL	132	1		1	43	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U4	COGO	151	1	1	1	13	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U4	CAGO	172	1	1	1	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U4	OSPR	364	1	1	7	11	AD. ON NEST TOP DEAD SPRUCE
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U5	CORA	486	3	1	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U5	MALL	132	1	1	3	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U5	MALL	132	4	3	4	10	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U5	UNSA	246.7	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U6	COGO	151	1	1	3	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U6	COGO	151	2	3	4	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U7	BAEA	352	1	1	1	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U7	COGO	151	1	1	1	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U7	COGO	151	1	1	1	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U7	COME	129	1	1	1	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U7	COGO	151	1	1	1	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U7	BBMA	475	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U8	UNGU	53.4	1	1	1	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U8	BAEA	352	1	1	1	11	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	MALL	132	1	1	1	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	MALL	132	7	3	4	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COGO	151	1	1	1	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COGO	151	19	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COGO	151	1	3	4	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	CAGO	172	9	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	RNGR	2	3	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	RNGR	2	1	1	1	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	CAGO	172	2	1	3	43	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	CAGO	172	5	3	4	43	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COGO	151	5	1	2	43	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	CAGO	172	10	1	3	24	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	BAEA	352	1	1	7	12	AD. ON N/TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	OSPR	364	1	1	7	11	AD.ON N/TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COLO	7	2	1	3	40	PROB. PR TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	MALL	132	3	1	2	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COLO	7	2	1	3	40	PROB PR TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COGO	151	1	1	3	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COGO	151	2	3	4	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COLO	7	2	1	3	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U9	COLO	7	1	3	4	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	MALL	132	1	1	3	10	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	MALL	132	6	3	4	10	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	COLO	7	2	1	3	40	TALBOT L.

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	COLO	7	2	3	4	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	MALL	132	1	1	3	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	MALL	132	7	3	4	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	COGO	151	1	1	3	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	COGO	151	4	3	4	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	COLO	7	2	2	3	40	PROB PR. TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	COLO	7	1	1	1	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	MALL	132	1	1	3	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	MALL	132	7	3	4	40	TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	COLO	7	2	2	3	40	PROB PR. TALBOT L.
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U10	CAGO	172	2	3	4	24	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	COLO	7	2	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	1	1	1	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	7	1	2	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	4	1	2	20	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	BUFF	153	1	1	3	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	BUFF	153	6	3	4	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	BAEA	352	1	1	1	11	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	COCR	488	3	1	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	1	1	3	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	5	3	4	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	4	1	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	UNDU	999	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	LEYE	255	1	1	1	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	24	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	MALL	132	10	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	COGO	151	2	1	2	40	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	BBMA	475	5	1	2	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	COGO	151	1	1	3	10	
HINTON	JULY	3	1992	610	745	6	CALM	100	EXCELLENT	U11	COGO	151	6	3	4	10	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U1	UNGU	53.4	9	1	2	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U1	UNSA	246.7	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U1	UNSA	246.7	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U1	UNSA	246.7	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U1	UNSA	246.7	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U1	UNGU	53.4	2	1	2	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U1	UNGU	53.4	100	1	2	13	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U2	MALL	132	1	1	1	43	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U2	AMKE	360	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U2	COME	129	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U3	COME	129	1	1	3	43	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U3	COME	129	10	3	4	43	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U3	COME	129	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U3	COME	129	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U3	UNGU	53.4	2	1	2	40	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U3	UNSA	246.7	8	1	2	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	COME	129	1	1	3	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	COME	129	12	3	4	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	COME	129	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	KILL	273	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	CAGO	172	2	1	3	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	CAGO	172	8	3	4	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	CAGO	172	5	1	3	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	CAGO	172	2	3	4	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	CAGO	172	5	1	3	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	CAGO	172	14	3	4	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	UNGU	53.4	5	1	2	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	UNGU	53.4	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	UNSA	246.7	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U4	UNSA	246.7	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U5	COME	129	1	1	1	40	FLYING
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U5	UNSA	246.7	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U5	COME	129	1	1	3	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U5	COME	129	7	3	4	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U5	COME	129	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U5	RTHA	337	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U6	UNGU	53.4	1	1	1	40	FLYING
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U6	COME	129	2	1	2	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U6	COME	129	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U7	COME	129	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U7	COME	129	1	1	3	13	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U7	COME	129	12	3	4	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U7	RTHA	337	1	1	1	10	FLYING
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U7	COME	129	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U7	COME	129	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U7	RTHA	337	1	1	1	10	1 CARRYING FOOD
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U8	RTHA	337	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1111	1303	18	CALM	0	10	U9	RTHA	337	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	BAEA	352	2	3	4	12	2 CHICKS IN NEST
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	MALL	132	0	3	4	14	NO COUNT ON YOUNG
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	MALL	132	1	1	3	14	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	KILL	273	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	COME	129	4	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	UNGU	53.4	3	1	2	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	UNSA	246.7	2	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	MALL	132	4	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	BLTE	77	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	BLTE	77	2	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	BAEA	352	2	1	3	10	FLYING-PARENTS
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	COME	129	5	1	0	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	CORA	486	2	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	UNSA	246.7	6	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	UNSA	246.7	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	LEYE	255	2	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D1	BLTE	77	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D2	LEYE	255	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D2	KILL	273	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D2	UNGU	53.4	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D2	BLTE	77	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D2	UNSA	246.7	5	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D2	COME	129	1	1	1	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	COME	129	5	3	4	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	COME	129	1	1	3	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	UNSA	246.7	4	1	2	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	KILL	273	2	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	BLTE	77	1	1	1	10	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	LEYE	255	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	RTHA	337	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	UNSA	246.7	3	1	2	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	CAGO	172	7	3	4	14	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	CAGO	172	2	1	3	14	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	AMWI	137	7	3	4	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	AMWI	137	1	1	3	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	UNSA	246.7	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	UNSA	246.7	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D3	UNGU	53.4	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D4	MALL	132	6	1	2	20	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D4	COME	129	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D4	FRGU	59	1	1	1	20	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D4	UNGU	53.4	1	1	1	20	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D5	COME	129	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D5	UNGU	53.4	6	1	2	23	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D5	UNGU	53.4	3	1	2	23	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D5	FRGU	59	1	1	1	23	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D5	RTHA	337	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D5	MALL	132	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D5	UNGU	53.4	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D6	CAGO	172	2	1	3	23	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D6	CAGO	172	1	3	4	23	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D6	UNGU	53.4	3	1	2	23	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D6	UNGU	53.4	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D6	RTHA	337	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D7	UNGU	53.4	1	1	1	40	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D7	KING	?	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D8	UNGU	53.4	1	1	2	13	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D8	UNSA	246.7	1	1	1	10	
GRAND PRAIRIE	JULY	4	1992	1330	1516	20	CALM	0	10	D9			0				NO BIRDS
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U1	MERL	357	1	1	1	10	FEMALE
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U1	COGO	151	1	1	1	40	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U1	COGO	151	2	1	2	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U1	KEST	360	1	1	1	22	FEMALE
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U1	UNSA	246.7	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U2	MALL	132	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U2	CORA	486	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U2	UNGU	53.4	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U2	GADW	135	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U2	AMWI	137	1	1	3	24	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U2	AMWI	137	4	3	4	24	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U2	MALL	132	1	1	3	24	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U2	MALL	132	4	3	4	24	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	UNSA	246.7	1	1	1	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	MALL	132	1	1	1	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	UNGU	53.4	5	1	2	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	MALL	132	4	1	2	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	BBMA	475	2	1	2	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	UNSA	246.7	2	1	1	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	UNDU	990	2	1	2	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	LESC	149	11	1	2	40	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	BUFF	153	5	1	2	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U3	COGO	151	1	1	2	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	UNSA	246.7	4	1	2	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	COGO	151	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	COGO	151	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	COGO	151	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	BUFF	153	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	MERL	357	1	1	1	22	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	UNSA	246.7	1	1	1	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	MALL	132	1	1	1	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U4	UNSA	246.7	1	1	1	13	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U5	RTHA	337	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U5	COME	129	2	1	2	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U5	UNSA	246.7	2	1	2	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U5	GADW	135	4	1	2	20	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U5	BAEA	352	1	1	7	21	NEST

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	BAEA	352	1	1	5	20	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	MALL	132	10	1	2	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	COME	129	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	RTHA	337	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	COGO	151	2	1	2	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	AMWI	137	1	1	3	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	AMWI	137	4	3	4	14	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	UNGU	53.4	2	1	2	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	MALL	132	4	1	2	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	MALL	132	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	AMWI	137	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	COME	129	2	1	2	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U6	UNGU	53.4	1	1	1	40	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U7	AMWI	137	1	1	3	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U7	AMWI	137	3	3	4	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U7	GADW	135	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U7	GHOW	375	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U7	UNSA	246.7	2	1	2	20	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U7	UNGU	53.4	1	1	1	20	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U7	LESC	149	1	1	1	40	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U7	UNGU	53.4	1	1	1	40	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U8	UNGU	53.4	1	1	1	20	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U8	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U8	UNSA	53.4	1	1	1	23	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U8	AMWI	137	1	1	1	20	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U8	SSHA	332	1	1	1	20	
PEACE RIVER	JULY	5	1992	615	803	14	CALM	0	10	U8	CAGO	172	50	4		10	LARGE GROUP AD/JV
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	UNGU	53.4	70	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	COME	129	2	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	CORA	486	1	1	1	20	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	LESC	149	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	UNGU	53.4	6	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	SHOV	142	8	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	MALL	132	1	1	1	20	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	COGO	151	1	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	COGO	151	5	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	AMKE	360	1	1	1	10	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	COGO	151	1	1	1	40	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D1	UNGU	53.4	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246.7	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	COGO	151	5	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	COGO	151	6	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	KILL	273	4	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNGU	53.4	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246.7	1	1	1	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246.7	2	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246.7	3	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	MALL	132	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	MALL	132	40	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	SWOV	142	1	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D2	COGO	151	2	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	UNSA	246.7	2	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	MALL	132	1	1	3	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	MALL	132	4	3	4	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	UNSA	146.7	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	COGO	151	3	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	UNSA	246.7	6	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	UNSA	246.7	3	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D3	MAHA	331	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	CAGO	172	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	KILL	273	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	AMWI	137	2	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	COME	129	4	1	2	40	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	COGO	151	4	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	UNSA	246.7	3	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	MALL	132	11	1	2	10	

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D4	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D5	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D5	BUFF	153	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D5	COGO	151	4	1	2	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D5	COGO	151	2	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D5	COGO	151	1	1	1	40	FLYING
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	UNGU	53.4	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	UNSA	246.7	2	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	UNGU	53.4	1	1	1	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	MALL	132	1	1	1	40	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	CORA	486	1	1	1	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	BAEA	352	1	1	1	22	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	CAGO	172	50	4		23	ADULT & YOUNG
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	CAGO	172	4	1	3	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D6	CAGO	172	16	3	4	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D7	OSPR	364	1	1	1	13	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D7	LESC	149	3	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D7	BAEA	352	1	2	1	22	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D7	UNSA	246.7	3	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D8	MALL	132	1	1	3	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D8	MALL	132	7	3	4	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D8	UNSA	246.7	2	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D8	COME	129	5	1	2	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D8	COME	129	1	1	1	23	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D9	UNSA	246.7	2	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D9	CORA	486	3	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D9	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D9	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D9	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D9	UNSA	246.7	3	1	2	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D9	COME	129	2	1	2	40	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D10	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D10	BAEA	352	1	1	7	12	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D10	BAEA	352	2	3	1	12	TWO BIRDS IN NEST

SITE	MONTH	DAY	YEAR	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	SECTION	SPCODE	AOU	NO	AGE	STATUS	HABITAT	COMMENTS
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D10	UNSA	246.7	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D10	KILL	273	1	1	1	10	
PEACE RIVER	JULY	5	1992	840	1055	18	CALM	0	10	D10	UNSA	246.7	1	1	1	10	

APPENDIX 14. HABITAT DATA FOR THE MAINSTEM RIVER SITES (PARHAB.WKQ).

1. LATITUDE
2. LONGITUDE
3. MEAN RIVER WIDTH (Km)
4. TOTAL SHORELINE LENGTH (Km)
5. ISLAND LENGTH (Km)
6. NUMBER OF GRAVEL BARS
7. TOTAL SIDE CHANNEL LENGTH (Km)
8. MAIN CHANNEL LENGTH (Km)
9. SIDE CHANNEL/MAIN CHANNEL
10. NUMBER OF RAPIDS
11. ELEVATION CHANGE OVER 1 Km
12. LAND FORESTED (5 Sq.Km)
13. LAND AGRICULTURE (5 Sq.Km)
14. LAND WATER, WETLAND (5 Sq.Km)
15. LAND INDUSTRIAL (5 Sq.Km)
16. LAND BOG, MUSKEG (5 Sq.Km)

SITE NAME:	SECTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
GRAND PRAIRIE UPSTREAM	U1	5505	11846	0.227	17.326	5.892	5	2.399	8.411	0.285	0.000	152.400	21.250	2.857	1.247	6.654	22.834
GRAND PRAIRIE UPSTREAM	U2	5503	11854	0.162	20.885	8.807	10	3.341	9.302	0.359	0.000	121.920	25.123	24.264	0.309	0.968	7.758
GRAND PRAIRIE UPSTREAM	U3	5503	11902	0.208	17.639	6.474	16	2.882	8.321	0.346	0.000	152.400	31.491	28.131	2.069	0.524	1.179
GRAND PRAIRIE UPSTREAM	U4	5506	11903	0.193	19.187	3.517	15	1.944	9.534	0.203	0.000	121.920	42.233	17.369	0.276	2.474	0.086
GRAND PRAIRIE UPSTREAM	U5	5502	11915	0.198	16.748	5.527	10	1.575	8.301	0.189	0.000	121.920	26.265	20.905	0.096	0.000	21.922
GRAND PRAIRIE UPSTREAM	U6	5501	11921	0.139	20.886	1.076	9	0.201	10.275	0.019	0.000	91.440	52.463	0.918	7.550	0.000	8.929
GRAND PRAIRIE UPSTREAM	U7	5459	11927	0.235	21.454	1.719	15	1.621	10.513	0.154	0.000	30.480	26.487	9.662	3.733	0.000	27.207
GRAND PRAIRIE UPSTREAM	U8	5458	11934	0.148	21.489	0.963	5	0.627	10.556	0.059	0.000	30.480	41.645	21.298	7.776	0.000	4.102
GRAND PRAIRIE UPSTREAM	U9	5455	11940	0.149	20.413	1.951	11	1.626	10.017	0.162	0.000	15.240	67.633	5.623	4.003	0.000	0.000
GRAND PRAIRIE DOWNSTREAM	D1	5505	11837	0.259	18.437	4.877	14	0.826	8.577	0.096	0.000	76.200	28.324	0.000	4.542	0.208	36.592
GRAND PRAIRIE DOWNSTREAM	D2	5507	11827	0.162	16.439	7.192	10	2.441	7.927	0.307	0.000	121.920	31.108	0.259	9.754	0.000	23.239
GRAND PRAIRIE DOWNSTREAM	D3	5508	11822	0.153	19.071	2.665	7	0.308	9.352	0.033	0.000	121.920	41.468	10.061	2.696	0.000	1.713
GRAND PRAIRIE DOWNSTREAM	D4	5509	11816	0.340	16.729	4.041	11	0.718	7.737	0.092	0.000	106.680	58.241	14.357	1.778	0.000	1.663
GRAND PRAIRIE DOWNSTREAM	D5	5512	11814	0.340	17.348	4.208	19	0.815	8.234	0.990	0.000	121.920	28.244	57.733	1.225	0.000	0.000
GRAND PRAIRIE DOWNSTREAM	D6	5514	11816	0.248	18.800	1.041	12	0.898	9.247	0.097	0.000	152.400	25.518	41.335	2.532	0.000	0.000
GRAND PRAIRIE DOWNSTREAM	D7	5518	11818	0.233	17.769	3.807	7	0.999	8.630	0.115	0.000	152.400	28.678	41.402	2.334	0.000	0.000
GRAND PRAIRIE DOWNSTREAM	D8	5522	11813	0.291	16.296	3.702	12	1.623	7.949	0.204	0.000	152.400	43.248	28.207	1.869	0.000	0.000
GRAND PRAIRIE DOWNSTREAM	D9	5525	11814	0.268	21.397	0.588	7	0.000	10.493	0.000	0.000	182.880	47.776	21.416	1.260	0.000	0.000
ATHABASCA R. DOWNSTREAM	D1	5448	11315	0.289	24.848	2.663	11	1.097	11.949	0.091	0.000	91.440	27.780	45.065	1.735	0.000	0.000
ATHABASCA R. DOWNSTREAM	D2	5452	11312	0.290	21.750	0.759	8	0.000	10.779	0.000	0.000	91.440	30.024	41.044	2.662	0.000	1.189
ATHABASCA R. DOWNSTREAM	D3	5455	11303	0.290	19.501	0.000	9	0.239	9.611	0.249	0.000	91.440	32.393	32.125	1.043	0.000	11.588
ATHABASCA R. DOWNSTREAM	D4	5458	11255	0.332	22.243	1.052	6	0.000	10.902	0.000	0.000	60.960	60.691	9.518	1.333	0.000	5.428
ATHABASCA R. DOWNSTREAM	D5	5458	11247	0.409	20.263	1.846	7	0.000	10.022	0.000	0.000	60.960	36.159	4.050	0.404	0.000	35.522
ATHABASCA R. DOWNSTREAM	D6	5502	11245	0.259	20.262	0.000	6	0.000	10.347	0.000	0.000	60.960	31.263	0.000	0.200	0.000	44.283
ATHABASCA R. UPSTREAM	U1	5445	11323	0.307	23.157	3.505	10	0.145	11.208	0.013	0.000	91.440	15.767	43.467	11.893	0.000	0.000
ATHABASCA R. UPSTREAM	U2	5444	11328	0.304	24.522	1.057	7	0.000	11.661	0.000	0.000	91.440	22.939	43.579	12.399	0.000	0.000

SITE NAME:	SECTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ATHABASCA R. UPSTREAM	U3	5453	11325	0.278	20.858	0.000	4	0.000	10.390	0.000	0.000	91.440	29.123	22.012	24.447	0.000	0.000
ATHABASCA R. UPSTREAM	U4	5459	11327	0.241	21.050	0.000	0	0.000	9.971	0.000	0.000	121.920	48.189	3.551	4.470	0.000	10.238
ATHABASCA R. UPSTREAM	U5	5504	11330	0.301	23.847	0.000	1	0.362	11.067	0.032	0.000	91.440	56.000	0.000	0.875	0.000	20.923
ATHABASCA R. UPSTREAM	U6	5508	11304	0.215	22.957	0.000	0	0.000	11.330	0.000	0.000	91.440	68.065	0.000	1.202	0.000	7.731
FORT McMURRAY DOWNSTREAM	D1	5702	11129	0.625	22.086	5.139	9	0.736	10.734	0.068	0.000	45.720	26.596	0.000	1.625	25.696	18.959
FORT McMURRAY DOWNSTREAM	D2	5705	11132	0.610	10.336	10.552	3	0.821	4.885	0.168	0.000	91.440	25.356	0.000	3.719	15.849	27.720
FORT McMURRAY DOWNSTREAM	D3	5708	11136	0.495	14.872	5.365	7	1.433	7.477	0.191	0.000	45.720	29.206	0.000	0.960	8.980	33.853
FORT McMURRAY DOWNSTREAM	D4	5711	11138	0.670	12.654	6.715	6	0.000	6.144	0.000	0.000	45.720	37.385	0.000	1.270	0.660	32.884
FORT McMURRAY DOWNSTREAM	D5	5714	11137	0.845	12.059	13.652	12	2.762	5.823	0.474	0.000	60.960	22.196	0.000	1.827	0.000	45.434
FORT McMURRAY DOWNSTREAM	D6	5717	11140	0.821	10.408	13.160	3	0.984	4.999	0.196	0.000	60.960	40.095	0.000	1.166	0.000	28.588
FORT McMURRAY DOWNSTREAM	D7	5720	11140	0.668	8.983	6.282	9	0.000	4.493	0.000	0.000	60.960	42.115	0.000	1.018	0.000	27.882
FORT McMURRAY DOWNSTREAM	D8	5722	11140	0.771	8.747	11.839	9	0.627	4.280	0.146	0.000	60.960	47.120	0.000	0.000	0.000	23.763
FORT McMURRAY UPSTREAM	U1	5642	11127	0.517	21.791	1.913	3	1.838	10.496	1.175	1.000	80.000	52.163	0.000	1.514	4.621	10.371
FORT McMURRAY UPSTREAM	U2	5639	11136	0.473	18.125	0.000	0	0.000	8.755	0.000	2.000	80.000	49.898	0.000	0.139	0.000	21.880
FORT McMURRAY UPSTREAM	U3	5637	11142	0.476	18.668	0.000	0	0.000	9.131	0.000	3.000	100.000	48.237	0.000	0.332	0.000	24.835
FORT McMURRAY UPSTREAM	U4	5635	11150	0.418	17.915	2.430	0	0.000	8.712	0.000	4.000	100.000	37.270	0.000	0.171	0.000	28.839
FORT McMURRAY UPSTREAM	U5	5635	11155	0.360	21.893	0.000	0	0.000	10.658	0.000	1.000	120.000	41.041	0.000	0.168	0.000	32.380
FORT McMURRAY UPSTREAM	U6	5634	11203	0.294	19.257	0.000	0	0.000	9.219	0.000	4.000	100.000	37.295	0.000	0.255	0.000	37.734
FORT McMURRAY UPSTREAM	U7	5633	11211	0.428	20.105	0.000	0	0.000	9.844	0.000	1.000	100.000	32.221	0.000	0.465	0.000	42.436
FORT McMURRAY UPSTREAM	U8	5634	11219	0.339	23.828	0.000	0	0.000	11.643	0.000	0.000	100.000	24.616	0.000	0.240	0.000	48.318
FORT McMURRAY UPSTREAM	U9	5632	11224	0.326	20.070	0.000	0	0.000	9.823	0.000	0.000	60.000	29.609	0.000	0.037	0.000	44.628
FORT McMURRAY UPSTREAM	U10	5631	11230	0.306	19.967	0.000	0	0.000	9.792	0.000	1.000	120.000	25.267	0.000	0.000	0.000	49.098
HINTON DOWNSTREAM	D1	5327	11729	0.168	14.303	4.199	13	0.685	6.912	0.099	0.000	60.960	74.315	0.000	0.270	2.127	0.000
HINTON DOWNSTREAM	D2	5325	11730	0.156	17.648	3.337	14	0.930	9.158	0.101	0.000	60.960	67.330	0.000	0.000	0.000	7.386
HINTON DOWNSTREAM	D3	5334	11717	0.137	16.757	2.348	7	0.643	7.959	0.080	0.000	60.960	68.313	0.000	0.000	0.361	7.862
HINTON DOWNSTREAM	D4	5336	11715	0.156	15.003	2.570	12	0.727	7.294	0.099	0.000	60.960	69.845	0.000	1.045	0.000	6.667
HINTON DOWNSTREAM	D5	5340	11709	0.142	23.223	1.032	25	2.801	11.205	0.250	0.000	121.920	57.666	0.000	0.216	0.000	18.635
HINTON DOWNSTREAM	D6	5343	11710	0.134	16.405	4.757	15	3.413	7.784	0.438	0.000	121.920	75.009	0.000	1.123	0.000	0.000
HINTON DOWNSTREAM	D7	5347	11709	0.216	13.179	12.262	20	6.076	6.297	0.965	0.000	121.920	68.688	0.000	2.027	0.000	4.602
HINTON DOWNSTREAM	D8	5350	11710	0.167	16.481	4.312	10	2.307	7.821	0.294	0.000	121.920	75.265	0.000	1.255	0.000	0.000
HINTON DOWNSTREAM	D9	5352	11707	0.142	17.227	3.105	13	1.939	8.137	0.238	0.000	121.920	62.414	0.000	0.670	0.000	13.410
HINTON DOWNSTREAM	D10	5357	11703	0.380	13.534	10.308	21	3.748	6.413	0.584	0.000	60.960	47.099	0.000	1.010	0.000	27.391
HINTON DOWNSTREAM	D11	5358	11656	0.129	17.875	6.960	25	5.405	8.965	0.602	0.000	60.960	75.713	0.000	0.475	0.000	0.000
HINTON DOWNSTREAM	D12	5300	11803	0.137	12.511	3.29	13	1.408	6.197	0.227	0	60.96	75.052	0	0.582	0	0
HINTON UPSTREAM	U1	5324	11737	0.126	15.209	2.631	7	0.545	7.460	0.073	0.000	60.960	62.313	0.000	0.746	13.520	0.000
HINTON UPSTREAM	U2	5322	11743	0.124	19.868	0.546	4	0.266	9.828	0.027	0.000	121.920	75.642	0.000	0.179	0.860	0.000
HINTON UPSTREAM	U3	5320	11749	0.878	20.042	0.000	2	0.000	9.487	0.000	0.000	60.960	70.937	0.000	0.206	0.000	0.000

SITE NAME:	SECTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
HINTON UPSTREAM	U4	5315	11752	1.231	13.705	1.991	17	0.000	5.708	0.000	0.000	60.960	67.700	0.000	0.933	0.000	0.000
HINTON UPSTREAM	U5	5313	11754	0.290	10.911	3.541	2	3.015	5.258	0.573	0.000	60.960	73.462	0.000	0.065	0.000	0.000
HINTON UPSTREAM	U6	5313	11757	0.238	5.732	1.198	20	8.930	2.640	3.381	0.000	60.960	74.501	0.000	0.346	0.000	0.000
HINTON UPSTREAM	U7	5312	11750	0.300	6.339	2.041	25	3.197	3.152	1.014	0.000	60.960	73.705	0.000	0.428	0.000	0.000
HINTON UPSTREAM	U8	5310	11758	0.271	10.473	4.363	25	2.052	4.663	0.440	0.000	121.920	57.911	0.000	0.000	0.000	0.000
HINTON UPSTREAM	U9	5307	11800	1.093	9.067	0.000	3	0.000	4.376	0.000	0.000	60.960	47.490	0.000	0.505	0.000	0.000
HINTON UPSTREAM	U10	5305	11802	1.377	6.867	3.421	7	0.000	3.253	0.000	0.000	60.960	43.899	0.000	2.138	0.000	0.000
HINTON UPSTREAM	U11	5303	11805	1.644	11.005	1.273	30	2.625	5.100	0.514	0.000	60.960	70.850	0.000	0.794	0.000	0.000
PEACE RIVER DOWNSTREAM	D1	5616	11718	0.997	10.987	12.145	11	1.019	5.379	0.189	0.000	152.400	32.694	31.427	0.084	7.110	0.000
PEACE RIVER DOWNSTREAM	D2	5618	11716	0.749	12.815	11.576	10	5.064	6.397	0.791	0.000	152.400	42.966	28.222	0.000	0.671	0.000
PEACE RIVER DOWNSTREAM	D3	5621	11712	0.642	12.989	8.435	6	2.320	6.203	0.374	0.000	152.400	56.378	14.348	0.000	0.000	0.000
PEACE RIVER DOWNSTREAM	D4	5625	11710	0.574	14.541	5.382	8	3.150	6.899	0.456	0.000	152.400	58.252	15.179	0.000	0.000	0.000
PEACE RIVER DOWNSTREAM	D5	5628	11706	0.614	14.636	8.379	6	1.780	7.264	0.245	0.000	182.880	61.470	10.615	0.000	0.000	0.000
PEACE RIVER DOWNSTREAM	D6	5602	11705	0.669	16.023	6.658	6	1.942	7.838	0.247	0.000	182.880	69.046	0.000	0.603	0.000	1.686
PEACE RIVER DOWNSTREAM	D7	5634	11707	0.557	15.608	5.827	6	1.499	7.692	0.194	0.000	152.400	66.459	0.000	0.304	0.000	3.008
PEACE RIVER DOWNSTREAM	D8	5638	11707	0.645	15.663	6.289	7	0.611	7.707	0.079	0.000	182.880	58.638	0.000	4.660	0.000	1.898
PEACE RIVER DOWNSTREAM	D9	5641	11713	0.721	18.473	6.839	5	0.000	9.078	0.000	0.000	182.880	45.030	8.689	0.499	0.000	18.716
PEACE RIVER DOWNSTREAM	D10	5644	11710	0.532	20.315	0.000	4	0.290	10.071	0.028	0.000	182.880	37.879	0.000	2.156	0.000	34.431
PEACE RIVER UPSTREAM	U1	5612	11619	1.066	10.717	8.488	17	1.571	5.129	0.306	0.000	121.920	42.816	15.012	0.032	7.117	3.360
PEACE RIVER UPSTREAM	U2	5612	11619	0.917	12.705	3.749	7	1.350	6.739	0.200	0.000	121.920	41.850	13.529	0.041	0.000	12.733
PEACE RIVER UPSTREAM	U3	5608	11629	0.584	7.135	4.224	7	0.623	7.136	0.087	0.000	121.920	49.514	15.226	0.551	0.000	6.464
PEACE RIVER UPSTREAM	U4	5606	11634	0.560	16.245	7.047	3	0.417	7.912	0.052	0.000	152.400	38.497	19.065	0.425	0.000	13.855
PEACE RIVER UPSTREAM	U5	5604	11633	0.702	9.092	6.072	5	1.013	4.401	0.230	0.000	152.400	48.763	14.671	0.069	0.000	8.516
PEACE RIVER UPSTREAM	U6	5602	11641	0.494	17.520	4.828	4	1.147	8.612	0.133	0.000	152.400	56.494	5.307	0.300	0.000	10.387
PEACE RIVER UPSTREAM	U7	5659	11648	0.641	12.122	9.749	7	2.094	5.895	0.355	0.000	213.360	47.901	7.926	0.050	0.000	15.884
PEACE RIVER UPSTREAM	U8	5652	11657	0.539	11.166	4.223	6	4.140	5.467	0.757	0.000	213.360	48.039	6.595	0.065	0.000	17.235

APPENDIX 15. DATA FOR THE PEACE-ATHABASCA DELTA SURVEYS (PADSURV.WKQ).

DATE	STARTTIME	ENDTIME	TEMP	WIND	CLOUD	VISIBIL	LAKE	LAT	LONG	DRAINAGE	CLASS.	DIST.	SURV.	SPCODE	AOU	AGE	STATUS	NO.	HABITAT	COMMENTS
JULY 7	805	827	12	CALM	80	10	1	5855	11112		2		8.32499	LESC	149	1	2	5	9	
JULY 7	805	827	12	CALM	80	10	1	5855	11112		2		8.32499	LESC	149	1	3	1	9	
JULY 7	805	827	12	CALM	80	10	1	5855	11112		2		8.32499	LESC	149	3	4		9	
JULY 7	805	827	12	CALM	80	10	1	5855	11112		2		8.32499	AMCO	221	1	1	1	9	
JULY 7	805	827	12	CALM	80	10	1	5855	11112		2		8.32499	AMCO	221	1	1	1	9	
JULY 7	805	827	12	CALM	80	10	1	5855	11112		2		8.32499	BLTE	77	1	2	20	9	
JULY 7	805	827	12	CALM	80	10	2	5854	11119		2		4.84510	BLTE	77	1	2	21	2	
JULY 7	805	827	12	CALM	80	10	2	5854	11119		2		4.84510	MALL	132	1	3	1	2	
JULY 7	805	827	12	CALM	80	10	2	5854	11119		2		4.84510	MALL	132	3	4		2	
JULY 7	805	827	12	CALM	80	10	2	5854	11119		2		4.84510	LESC	149	1	2	21	2	
JULY 7	805	827	12	CALM	80	10	2	5854	11119		2		4.84510	BUFF	153	1	2	4	2	
JULY 7	805	827	12	CALM	80	10	2	5854	11119		2		4.84510	RUDU	167	1	2	4	2	
JULY 7	805	827	12	CALM	80	10	2	5854	11119		2		4.84510	AMCO	221	1	2	19	2	
JULY 7	805	827	12	CALM	80	10	3	5854	11117		2		6.78411	BLTE	77	1	1	1	2	
JULY 7	805	827	12	CALM	80	10	3	5854	11117		2		6.78411	MALL	132	1	2	1	2	
JULY 7	805	827	12	CALM	80	10	3	5854	11117		2		6.78411	AMWI	137	1	2	1	2	
JULY 7	805	827	12	CALM	80	10	3	5854	11117		2		6.78411	SNOV	142	1	2	2	2	
JULY 7	805	827	12	CALM	80	10	3	5854	11117		2		6.78411	LESC	149	1	2	13	2	
JULY 7	805	827	12	CALM	80	10	3	5854	11117		2		6.78411	UNDU	999	1	3	1	2	
JULY 7	805	827	12	CALM	80	10	3	5854	11117		2		6.78411	UNDU	999	3	4		2	
JULY 7	805	827	12	CALM	80	10	4	5855	11111		1		32.01660	UNGU	53.4	1	2	2	9	
JULY 7	805	827	12	CALM	80	10	4	5855	11111		1		32.01660	COGO	151	1	2	6	9	RDESROCHERS
JULY 7	805	827	12	CALM	80	10	5	5852	1119		1		20.95708	COGO	151	1	1	1	8	
JULY 7	805	827	12	CALM	80	10	5	5852	1119		1		20.95708	UNDU	999	1	2	3	8	REVEILLON COUPE
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	BLTE	77	1	2	8	5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	MALL	132	1	2	3	5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	SNOV	142	1	1	1	5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	LESC	149	1	2	69	5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	BUFF	153	1	3	1	5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	BUFF	153	3	4		5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	AMCO	221	1	1	1	5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	GHOW	375	1	1	1	5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	UNDU	999	1	2	2	5	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	PBGR	6	1	1	1	6	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	BLTE	77	1	2	7	6	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	MALL	132	1	2	2	6	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	GADW	135	1	3	1	6	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	GADW	135	3	4		6	
JULY 7	805	827	12	CALM	80	10	6	5849	11126		3		26.77811	AMWI	137	1	2	2	6	

JULY 7	805	827	12	CALM	80	10	6	5849	11126	3	26.77811	SHOV	142	1	2	2	6	
JULY 7	805	827	12	CALM	80	10	6	5849	11126	3	26.77811	LESC	149	1	2	15	6	
JULY 7	805	827	12	CALM	80	10	6	5849	11126	3	26.77811	BUFF	153	1	2	2	6	
JULY 7	805	827	12	CALM	80	10	6	5849	11126	3	26.77811	AMCO	221	1	1	1	6	
JULY 7	805	827	12	CALM	80	10	7	5848	11115	1	9.89423	COTE	70	1	2	2	6	
JULY 7	805	827	12	CALM	80	10	7	5848	11115	1	9.89423	AMWI	137	1	2	2	6	
JULY 7	805	827	12	CALM	80	10	7	5848	11115	1	9.89423	BAEA	352	2	1	1	6	
JULY 7	805	827	12	CALM	80	10	8	5843	11112	1	11.50865	UNGU	53.4	1	2	2	8	
JULY 7	805	827	12	CALM	80	10	8	5843	11112	1	11.50865	BAEA	352	1	1	1	8	
JULY 7	805	827	12	CALM	80	10	8	5843	11112	1	11.50865	UNDU	999	1	2	1	8	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	LESC	149	1	2	35	1	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	CAGO	172	1	2	9	1	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	MALL	132	1	2	6	2	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	AMWI	137	1	2	2	2	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	AMWI	137	1	3	1	2	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	AMWI	137	3	4		2	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	MALL	132	1	2	2	5	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	LESC	149	1	2	2	5	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	COGO	151	1	2	3	5	
JULY 7	805	827	12	CALM	80	10	9	5845	11118	1	9.91957	BUFF	153	1	2	2	5	
JULY 7	805	827	12	CALM	80	10	10	5847	11112	1	13.42002	LESC	149	1	2	12	5	
JULY 7	805	827	12	CALM	80	10	10	5847	11112	1	13.42002	COGO	151	1	1	1	5	
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	MALL	132	1	3	1	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	MALL	132	1	2	119	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	MALL	132	3	4		2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	GADW	135	1	2	8	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	AMWI	139	1	2	4	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	BWTE	140	1	1	1	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	SHOV	142	1	2	4	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	PINT	143	1	2	5	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	REDH	146	1	2	1	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	LESC	149	1	2	6	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	AMCO	221	1	1	1	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	UNDU	999	1	2	25	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	UNDU	999	1	3	1	2	EGG LAKE
JULY 7	805	827	12	CALM	80	10	11	5853	11123	2	12.90216	UNDU	999	3	4		2	EGG LAKE
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	UNGU	53.4	1	1	12	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	FRGU	59	1	1	1	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	COTE	70	1	1	2	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	BLTE	77	1	2	13	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	GADW	135	1	2	15	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	AGWT	139	1	1	1	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	UNTL	140.1	1	2	2	7	FLETCHER CHANNEL

JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	SHOV	142	1	1	1	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	MAHA	331	1	1	1	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	BAEA	352	2	1	1	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	12	5830	11103	1	59.83211	BAEA	352	2	1	1	7	FLETCHER CHANNEL
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	COTE	70	1	1	1	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	BLTE	77	1	2	2	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	MALL	132	1	2	68	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	AMWI	137	1	2	60	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	SHOV	142	1	2	13	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	CANV	147	1	2	34	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	LESC	149	1	2	44	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	RNDU	150	1	2	1	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	RUDU	167	1	2	1	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	AMCO	221	1	2	14	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	MAHA	331	1	1	1	2	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	BLTE	77	1	2	4	6	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	MALL	132	1	2	36	6	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	GADW	135	1	2	50	6	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	AMWI	137	1	2	110	6	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	BWTE	140	1	2	1	6	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	CANV	147	1	2	5	6	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	LESC	149	1	2	80	6	
JULY 7	1145	1420	14	WINDY	100	10	13	5829	11108	2	24.30689	AMCO	221	1	2	8	6	
JULY 7	1145	1420	14	WINDY	100	10	14	5832	11109	2	8.60567	BLTE	77	1	1	1	2	
JULY 7	1145	1420	14	WINDY	100	10	14	5832	11109	2	8.60567	MALL	132	1	2	5	2	
JULY 7	1145	1420	14	WINDY	100	10	14	5832	11109	2	8.60567	AMWI	137	1	2	27	2	
JULY 7	1145	1420	14	WINDY	100	10	14	5832	11109	2	8.60567	RUDU	167	1	2	1	2	
JULY 7	1145	1420	14	WINDY	100	10	14	5832	11109	2	8.60567	AMCO	221	1	2	7	2	
JULY 7	1145	1420	14	WINDY	100	10	15	5832	11112	3	2.32286	MALL	132	1	2	1	2	
JULY 7	1145	1420	14	WINDY	100	10	15	5832	11112	3	2.32286	BWTE	140	1	2	3	2	
JULY 7	1145	1420	14	WINDY	100	10	15	5832	11112	3	2.32286	AMCO	221	1	1	1	2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	MALL	132	1	3	1	2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	MALL	132	1	2	11	2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	MALL	132	3	4		2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	GADW	135	1	2	1	2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	AMWI	137	1	2	2	2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	BWTE	140	1	1	1	2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	LESC	149	1	2	4	2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	RUDU	167	1	1	1	2	
JULY 7	1145	1420	14	WINDY	100	10	16	5833	11110	2	9.91543	AMCO	221	1	1	1	2	
JULY 7	1145	1420	14	WINDY	100	10	17	5835	11107	2	43.69618	MALL	132	1	2	10	2	GALOOT LAKE
JULY 7	1145	1420	14	WINDY	100	10	17	5835	11107	2	43.69618	GADW	135	1	2	2	2	GALOOT LAKE
JULY 7	1145	1420	14	WINDY	100	10	17	5835	11107	2	43.69618	AMWI	137	1	2	12	2	GALOOT LAKE

JULY 7	1145	1420	14	WINDY	100	10	17	5835	11107	2	43.69618	SHOV	142	1	2	2	2	GALOOT LAKE
JULY 7	1145	1420	14	WINDY	100	10	17	5835	11107	2	43.69618	LESC	149	1	2	2	2	GALOOT LAKE
JULY 7	1145	1420	14	WINDY	100	10	17	5835	11107	2	43.69618	BUFF	153	1	2	2	2	GALOOT LAKE
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	UNGU	53.4	1	2	2	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	MALL	132	1	2	18	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	GADW	135	1	2	2	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	AMWI	139	1	2	39	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	BWTE	140	1	2	4	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	SHOV	142	1	2	1	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	PINT	143	1	2	2	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	REDH	146	1	2	1	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	CANV	147	1	2	2	2	
JULY 7	1145	1420	14	WINDY	100	10	18	5836	11055	1	17.12994	LESC	149	1	2	8	2	
JULY 7	1145	1420	14	WINDY	100	10	19	5835	11046	1	41.93748	UNGU	53.4	1	2	2	7	
JULY 7	1145	1420	14	WINDY	100	10	19	5835	11046	1	41.93748	BLTE	77	1	2	2	7	
JULY 7	1145	1420	14	WINDY	100	10	19	5835	11046	1	41.93748	MALL	132	1	2	12	7	
JULY 7	1145	1420	14	WINDY	100	10	19	5835	11046	1	41.93748	GADW	135	1	2	6	7	
JULY 7	1145	1420	14	WINDY	100	10	19	5835	11046	1	41.93748	AMWI	137	1	2	52	7	
JULY 7	1145	1420	14	WINDY	100	10	19	5835	11046	1	41.93748	AGWT	139	1	1	1	7	
JULY 7	1145	1420	14	WINDY	100	10	19	5835	11046	1	41.93748	AMCO	221	1	2	1	7	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	UNGU	53.4	1	2	5	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	FRGU	59	1	2	8	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	COTE	70	1	2	9	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	BLTE	77	1	2	32	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	MALL	132	1	2	98	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	GADW	135	1	2	4	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	AMWI	137	1	2	77	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	BWTE	140	1	2	1	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	SHOV	142	1	2	10	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	PINT	143	1	2	3	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	REDH	146	1	2	5	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	CANV	147	1	2	6	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	LESC	149	1	2	95	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	RNDU	150	1	2	12	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	RUDU	167	1	2	5	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	AMCO	221	1	2	19	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	UNDU	999	1	3	1	2	
JULY 7	1145	1420	14	WINDY	100	10	20	5832	11053	2	21.39179	UNDU	999	3	4		2	
JULY 7	1145	1420	14	WINDY	100	10	21	5826	11055	2	11.93270	PBGR	6	1	1	1	2	FRIEZE LAKE
JULY 7	1145	1420	14	WINDY	100	10	21	5826	11055	2	11.93270	UNGR	6.1	1	2	3	2	FRIEZE LAKE
JULY 7	1145	1420	14	WINDY	100	10	21	5826	11055	2	11.93270	FRGU	59	1	2	775	2	FRIEZE LAKE
JULY 7	1145	1420	14	WINDY	100	10	21	5826	11055	2	11.93270	COTE	77	1	1		2	FRIEZE LAKE
JULY 7	1145	1420	14	WINDY	100	10	21	5826	11055	2	11.93270	BLTE	77	1	2	77	2	FRIEZE LAKE

JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	MALL	132	1	2	25	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	MALL	132	1	3	2	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	MALL	132	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	MALL	132	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	GADW	135	1	2	1	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMWI	137	1	3	25	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMWI	137	1	2	22	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMWI	137	3	4	2	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMWI	137	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	UNTL	140.1	1	2	6	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	SHOV	142	1	2	1	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	PINT	143	1	2	1	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	CANV	147	1	2	1	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	LESC	149	1	3	1	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	LESC	149	1	2	3	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	LESC	149	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	RUDU	167	1	2	79	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMCO	221	1	2	2	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMCO	221	1	3	5	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMCO	221	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMCO	221	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMCO	221	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMCO	221	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	AMCO	221	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	MAHA	331	1	1	1	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	BAEA	352	2	1	1	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	UNDU	999	1	3	2	2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	UNDU	999	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	21 5826 11055	2	11.93270	UNDU	999	3	4		2 FRIEZE LAKE
JULY 7	1145	1420	14 WINDY	100	10	22 5827 11100	2	18.48367	BLTE	77	1	2	15	2
JULY 7	1145	1420	14 WINDY	100	10	22 5827 11100	2	18.48367	MALL	132	1	2	4	2
JULY 7	1145	1420	14 WINDY	100	10	22 5827 11100	2	18.48367	AMWI	137	1	2	1	2
JULY 7	1145	1420	14 WINDY	100	10	22 5827 11100	2	18.48367	REDH	146	1	2	1	2
JULY 7	1145	1420	14 WINDY	100	10	22 5827 11100	2	18.48367	LESC	149	1	2	11	2
JULY 7	1145	1420	14 WINDY	100	10	22 5827 11100	2	18.48367	RNDU	150	1	2	3	2
JULY 7	1145	1420	14 WINDY	100	10	22 5827 11100	2	18.48367	AMCO	221	1	2	11	2
JULY 7	1145	1420	14 WINDY	100	10	23 5829 11057	2	17.20158	UNGU	53.4	1	1	1	2
JULY 7	1145	1420	14 WINDY	100	10	23 5829 11057	2	17.20158	FRGU	59	1	2	2	2
JULY 7	1145	1420	14 WINDY	100	10	23 5829 11057	2	17.20158	BLTE	77	1	2	54	2
JULY 7	1145	1420	14 WINDY	100	10	23 5829 11057	2	17.20158	MALL	132	1	2	11	2
JULY 7	1145	1420	14 WINDY	100	10	23 5829 11057	2	17.20158	MALL	132	1	3	1	2
JULY 7	1145	1420	14 WINDY	100	10	23 5829 11057	2	17.20158	MALL	132	3	4		2
JULY 7	1145	1420	14 WINDY	100	10	23 5829 11057	2	17.20158	AMWI	137	1	2	4	2

JULY	7	1145	1420	14	WINDY	100	10	23	5829	11057	2	17.20158	CANV	147	1	2	1	2
JULY	7	1145	1420	14	WINDY	100	10	23	5829	11057	2	17.20158	LESC	149	1	3	1	2
JULY	7	1145	1420	14	WINDY	100	10	23	5829	11057	2	17.20158	LESC	149	3	4		2
JULY	7	1145	1420	14	WINDY	100	10	23	5829	11057	2	17.20158	RNDU	150	1	2	2	2
JULY	7	1145	1420	14	WINDY	100	10	23	5829	11057	2	17.20158	RUDU	167	1	2	6	2
JULY	7	1145	1420	14	WINDY	100	10	23	5829	11057	2	17.20158	AMCO	221	1	2	11	2
JULY	7	1145	1420	14	WINDY	100	10	23	5829	11057	2	17.20158	UNDU	999	1	3	1	2
JULY	7	1145	1420	14	WINDY	100	10	23	5829	11057	2	17.20158	UNDU	999	3	4		2
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	MALL	132	1	2	4	1 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	GADW	135	1	2	6	1 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AMWI	137	1	2	76	1 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CANV	147	1	2	1	1 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	LESC	149	1	2	28	1 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	COGO	151	1	2	4	1 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	1	2	200	1 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNGU	53.4	1	2	2	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	FRGU	59	1	2	50	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	COTE	70	1	2	2	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	BLTE	77	1	2	32	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	WHPE	125	1	2	7	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	MALL	132	1	2	108	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AMWI	137	1	2	75	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AMWI	137	1	3	1	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AMWI	137	3	4		2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AGWT	139	1	2	10	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AGWT	139	1	3	1	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AGWT	139	3	4		2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	BWTE	140	1	2	4	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	SHOV	142	1	2	6	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	PINT	143	1	2	2	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CANV	147	1	3	1	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CANV	147	1	2	56	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CANV	147	1	3		2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CANV	147	3	4		2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CANV	147	3	4		2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	LESC	149	1	3	1	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	LESC	149	1	2	340	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	LESC	149	3	4		2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	RNDU	150	1	2	1	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	COGO	151	1	2	2	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CAGO	172	1	3		2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CAGO	172	1	2	23	2 RICHARDSON LAKE
JULY	7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CAGO	172	3	4		2 RICHARDSON LAKE

JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CAGO	172	3	4		2	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CAGO	172	3	4		2	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AMCO	221	1	2	13	2	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	BAEA	352	2	1	1	2	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	1	3	1	2	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	3	4		2	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	FRGU	59	1	2	105	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	BLTE	77	1	2	15	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	MALL	132	1	3	1	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	MALL	132	1	3	1	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	MALL	132	1	2	20	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	MALL	132	3	4		7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	MALL	132	3	4		7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	GADW	135	1	2	5	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	AMWI	137	1	2	7	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	SHOV	142	1	2	1	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	LESC	149	1	2	9	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	RNDU	150	1	2	1	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	BUFF	153	1	2	1	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CAGO	172	1	3		7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	CAGO	172	3	4		7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	MAHA	331	1	1	1	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	1	2	35	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	1	3	1	7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	3	4		7	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNGU	53.4	1	2	60	8	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	LESC	149	1	2	17	8	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	COGO	151	1	2	1	8	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	BAEA	352	1	5	2	8	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	1	2	50	8	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	1	3	1	8	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	24	5823	11102	1	52.14877	UNDU	999	3	4		8	RICHARDSON LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	MALL	132	1	1	1	2	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	AMWI	137	1	1	10	2	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	LESC	149	2	2	62	2	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	AMCO	221	1	2	5	2	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	UNDU	999	1	3	1	2	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	UNDU	999	3	4		2	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	AMWI	137	1	2	1	5	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	GRYE	254	1	1	1	6	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	AMWI	137	1	1	1	7	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	25	5824	11119	2	4.85436	COGO	151	1	2	3	7	BLANCHE LAKE
JULY 7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	UNGU	53.4	1	2	5	2	LIMON LAKE

JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	BLTE	77	1	2	166	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	WHPE	125	1	2	2	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	MALL	132	1	3	1	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	MALL	132	1	3	1	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	MALL	132	1	2	65	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	MALL	132	1	3	1	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	MALL	132	3	4		2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	MALL	132	3	4		2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	MALL	132	3	4		2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	AMWI	137	1	2	20	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	BWTE	140	1	2	6	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	LESC	149	1	2	12	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	COGO	151	1	3	1	2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	COGO	151	3	4		2 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	FRGU	59	1	1	1	7 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	MALL	132	1	1	1	7 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	REDH	146	1	2	2	7 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	LESC	149	1	2	15	7 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	COGO	151	1	2	2	7 LIMON LAKE
JULY	7	1145	1420	14	WINDY	100	10	26	5825	11120	2	18.44637	BAEA	352	1	7	1	8 LIMON (5824 11120)
JULY	7	1145	1420	14	WINDY	100	10	27	5825	11127	2	9.56455	MALL	132	1	2	240	2 DAGMAR LAKE
JULY	7	1145	1420	14	WINDY	100	10	27	5825	11127	2	9.56455	CAGO	172	1	2	20	2 DAGMAR LAKE
JULY	7	1145	1420	14	WINDY	100	10	27	5825	11127	2	9.56455	UNDU	999	1	3	1	2 DAGMAR LAKE
JULY	7	1145	1420	14	WINDY	100	10	27	5825	11127	2	9.56455	UNDU	999	3	4		2 DAGMAR LAKE
JULY	7	1145	1420	14	WINDY	100	10	27	5825	11127	2	9.56455	MALL	132	1	2	27	6 DAGMAR LAKE
JULY	7	1145	1420	14	WINDY	100	10	27	5825	11127	2	9.56455	LESC	149	1	2	2	6 DAGMAR LAKE
JULY	7	1145	1420	14	WINDY	100	10	27	5825	11127	2	9.56455	CAGO	172	1	2	1	6 DAGMAR LAKE
JULY	7	1145	1420	14	WINDY	100	10	27	5825	11127	2	9.56455	BAEA	352	1	2	2	6 DAGMAR LAKE
JULY	7	1145	1420	14	WINDY	100	10	28	5827	11120	1	53.18224	UNGU	53.4	1	1	1	8 ATHABASCA RIVER
JULY	7	1145	1420	14	WINDY	100	10	28	5827	11120	1	53.18224	COTE	70	1	1	1	8 ATHABASCA RIVER
JULY	7	1145	1420	14	WINDY	100	10	28	5827	11120	1	53.18224	BLTE	77	1	2	2	8 ATHABASCA RIVER
JULY	7	1145	1420	14	WINDY	100	10	28	5827	11120	1	53.18224	MALL	132	1	2	2	8 ATHABASCA RIVER
JULY	7	1145	1420	14	WINDY	100	10	28	5827	11120	1	53.18224	SHOV	142	1	2	3	8 ATHABASCA RIVER
JULY	7	1145	1420	14	WINDY	100	10	28	5827	11120	1	53.18224	RTHA	337	1	1	1	8 ATHABASCA RIVER
JULY	7	1145	1420	14	WINDY	100	10	28	5827	11120	1	53.18224	UNDU	999	1	2	5	8 ATHABASCA RIVER
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	EAGR	4	1	1	1	2 MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	UNGR	6.1	1	2	4	2 MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	UNGU	53.4	1	2	12	2 MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	FRGU	59	1	2	198	2 MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	BLTE	77	1	2	116	2 MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	WHPE	125	1	2	40	2 MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	MALL	132	1	3	1	2 MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	MALL	132	1	2	609	2 MAMAWI LAKE

JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	MALL	132	3	4		2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	GADW	135	1	2	50	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AMWI	137	1	2	128	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AGWT	139	1	3	1	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AGWT	139	3	4		2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	BWTE	140	1	2	16	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	SHOV	142	1	2	74	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	PINT	143	1	2	55	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	REDH	146	1	2	5	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	CANV	147	1	2	282	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	LESC	149	1	2	236	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	RNDU	150	1	2	6	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	COGO	151	1	2	71	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	BUFF	153	1	2	2	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AMCO	221	1	2	86	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	MAHA	331	1	1	3	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	UNDU	999	1	2	90	2	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	BLTE	77	1	2	7	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	MALL	132	1	2	75	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	GADW	135	1	1	1	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AMWI	137	1	2	27	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	BWTE	140	1	2	51	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	SHOV	142	1	2	97	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	PINT	143	1	2	23	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	CANV	147	1	2	86	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	LESC	149	1	2	60	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AMCO	221	1	1	1	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	MAHA	331	1	1	1	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	UNDU	999	1	2	250	5	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	BLTE	77	1	2	4	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	MALL	132	1	2	66	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	GADW	135	1	2	3	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AMWI	137	1	3	1	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AMWI	137	1	2	22	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AMWI	137	3	4		7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	BWTE	140	1	2	24	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	SHOV	142	1	2	20	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	PINT	143	1	2	55	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	LESC	149	1	2	2	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	AMCO	221	1	1	1	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	BAEA	352	2	1	1	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	GHOW	375	1	1	1	7	MAMAWI LAKE
JULY	7	1450	1635	14	WINDY	0	10	29	5834	11115	1	108.03833	UNDU	999	1	2	2	7	MAMAWI LAKE

JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	RNGR	2	1	1	1	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	EAGR	4	1	1	1	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BLTE	77	1	2	221	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	MALL	132	1	2	512	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	GADW	135	1	2	10	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMWI	137	1	2	617	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMWI	137	1	3	1	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMWI	137	3	4		2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AGWT	139	1	2	4	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BWTE	140	1	2	38	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	UNTL	140	1	2	10	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BWTE	140	1	3	1	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BWTE	140	3	4		2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	SHOV	142	1	2	127	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	PINT	143	1	2	76	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	REDH	146	1	2	4	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	CANV	147	1	2	1	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	LESC	149	1	2	6	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	RNDU	150	1	2	2	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	COGO	151	1	2	20	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BUFF	153	1	2	17	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	RUDU	167	1	2	2	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMCO	221	1	2	149	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMCO	221	1	3	2	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMCO	221	3	4		2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	LEYE	255	1	2	2	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	UNDI	999	1	2	125	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	UNDU	999	1	2	200	2	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	MALL	132	1	2	167	5	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMWI	137	1	2	158	5	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BWTE	140	1	2	10	5	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	PINT	143	1	2	60	5	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	LESC	149	1	2	20	5	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BUFF	153	1	2	10	5	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	RUDU	167	1	1	1	5	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMCO	221	1	2	30	5	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	UNGR	6.1	1	2	3	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BLTE	77	1	2	76	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	MALL	132	1	3	1	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	MALL	132	1	2	128	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	MALL	132	3	4		7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	GADW	135	1	2	32	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMWI	137	1	2	428	7	OTTER LAKE

JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BWTE	140	1	2	12	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	SHOV	142	1	2	69	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	PINT	143	1	2	14	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	LESC	149	1	2	38	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BUFF	153	1	2	3	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	AMCO	221	1	2	33	7	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	30	5833	11134	2	28.44632	BAEA	352	2	1	1	8	OTTER LAKE
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	RNGR	2	1	2	3	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	UNGR	6.1	1	2	2	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	COTE	70	1	2	4	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	BLTE	77	1	2	127	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	MALL	132	1	2	86	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	MALL	132	1	3	1	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	MALL	132	3	4		2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	GADW	135	1	2	3	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	AMWI	137	1	2	23	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	BWTE	140	1	2	9	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	SHOV	142	1	2	12	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	PINT	143	1	2	1	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	REDH	146	1	2	1	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	LESC	149	1	2	17	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	COGO	151	1	2	2	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	BUFF	153	1	2	1	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	RUDU	167	1	2	2	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	AMCO	221	1	3	1	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	AMCO	221	1	2	10	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	AMCO	221	3	4		2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	MAMA	331	1	2	1	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	UNDU	999	1	2	4	2	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	EAGR	4	1	2	2	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	BLTE	77	1	2	34	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	MALL	132	1	2	48	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	AMWI	137	1	2	17	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	AGWT	139	1	2	2	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	BWTE	140	1	2	4	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	SHOV	142	1	2	6	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	PINT	143	1	2	2	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	LESC	149	1	2	7	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	COGO	151	1	2	7	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	RUDU	167	1	2	1	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	AMCO	221	1	2	17	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	GHOW	375	1	1	1	7	PAIR LAKES
JULY	7	1450	1635	14	WINDY	0	10	31	5831	11128	2	12.84651	UNDU	999	1	2	3	7	PAIR LAKES

JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	UNGR	6.1	1	2	1	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	UNGU	53.4	1	1	4	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	FRGU	59	1	2	1	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	COTE	70	1	2	24	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	BLTE	77	1	2	19	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	MALL	132	1	3	1	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	MALL	132	1	3	1	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	MALL	132	1	2	18	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	MALL	132	3	4		2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	MALL	132	3	4		2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	GADW	135	1	2	3	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	BWTE	140	1	2	2	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	UNTL	140.1	1	2	2	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	CANV	147	1	2	2	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	LESC	149	1	2	12	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	COGO	151	1	2	3	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	RUDU	167	1	2	4	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	AMCO	221	1	3	1	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	AMCO	221	1	2	21	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	AMCO	221	3	4		2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	UNDU	999	1	2	10	2	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	BLTE	77	1	2	6	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	MALL	132	1	2	3	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	AMWI	137	1	2	65	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	AMWI	137	1	2	9	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	SHOV	142	1	2	1	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	SHOV	142	1	2	1	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	REDH	146	1	2	3	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	RNDU	150	1	2	2	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	COGO	151	1	2	1	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	AMCO	221	1	2	2	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	UNDU	999	1	2	6	5	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	32	5846	11142	2	28.85943	AMWI	137	1	2	20	7	BARIL	LAKE
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	COTE	70	1	2	17	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	BLTE	77	1	2	64	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	MALL	132	1	2	163	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	GADW	135	1	2	34	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	AMWI	137	1	2	223	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	BWTE	140	1	2	3	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	UNTL	140.1	1	2	6	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	PINT	143	1	2	43	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	REDH	146	1	2	1	2		
JULY 8	1450	1635	14	WINDY	0	10	33	5841	11144	1	15.04370	CANV	147	1	2	20	2		

JULY 8	1450	1635	14 WINDY	0	10	33 5841 11144	1	15.04370	LESC	149	1	2	99	2
JULY 8	1450	1635	14 WINDY	0	10	33 5841 11144	1	15.04370	COGO	151	1	2	14	2
JULY 8	1450	1635	14 WINDY	0	10	33 5841 11144	1	15.04370	BIFF	153	1	2	1	2
JULY 8	1450	1635	14 WINDY	0	10	33 5841 11144	1	15.04370	RUDU	167	1	2	1	2
JULY 8	1450	1635	14 WINDY	0	10	33 5841 11144	1	15.04370	AMCO	221	1	2	18	2
JULY 8	1450	1635	14 WINDY	0	10	33 5841 11144	1	15.04370	MAHA	331	1	1	2	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	RNDU	50	1	2	2	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	FRGU	59	1	1	1	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	COTE	70	1	2	6	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	COTE	70	1	2	2	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	BLTE	77	1	2	62	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	BLTE	77	1	2	40	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	MALL	132	1	3	1	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	MALL	132	1	3	1	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	MALL	132	1	2	58	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	MALL	132	1	2	44	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	MALL	132	1	2	40	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	MALL	132	3	4		2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	MALL	132	3	4		2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	GADW	135	1	2	5	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	GADW	135	1	2	107	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	GADW	135	1	2	15	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	GADW	135	1	3	1	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	GADW	135	3	4		2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	AMWI	137	1	2	61	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	AMWI	137	1	2	30	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	AMWI	137	1	2	495	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	AGWT	139	1	2	2	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	BWTE	140	1	2	8	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	BWTE	140	1	2	7	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	BWTE	140	1	2	4	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	SHOV	142	1	2	1	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	SHOV	142	1	2	11	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	PINT	143	1	2	17	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	PINT	143	1	2	4	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	PINT	143	1	2	1	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	REDH	146	1	2	2	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	REDH	146	1	2	4	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	CANV	147	1	2	4	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	CANV	147	1	2	9	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	LESC	149	1	2	35	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	LESC	149	1	2	23	2
JULY 8	1450	1635	14 WINDY	0	10	34 5843 11151	1	63.46448	RNDU	150	1	2	1	2

JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	RNDU	150	1	3	1	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	RNDU	150	3	4		2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	COGO	151	1	2	3	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	BUFF	153	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	BUFF	153	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	RUDU	167	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	RUDU	167	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMCO	221	1	2	32	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMCO	221	1	2	10	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMCO	221	1	2	33	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	CORA	486	1	1	1	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	CORA	486	1	1	2	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	UNDU	999	1	2	133	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	UNDU	999	1	2	10	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	UNDU	999	1	2	29	2
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	UNGU	53.4	1	2	3	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	COTE	70	1	2	3	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	BLTE	77	1	2	3	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	MALL	132	1	2	14	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	MALL	132	1	2	21	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	MALL	132	1	2	164	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	GADW	135	1	2	60	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	GADW	135	1	2	25	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	GADW	135	1	2	126	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMWI	137	1	2	22	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMWI	137	1	2	1347	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMWI	137	1	2	199	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AGWT	139	1	2	1	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	BWTE	140	1	2	2	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	SHOV	142	1	2	61	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	SHOV	142	1	2	59	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	PINT	143	1	2	13	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	PINT	143	1	2	1	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	REDH	146	1	2	17	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	CANV	147	1	2	30	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	CANV	147	1	2	1	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	LESC	149	1	2	57	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	RNDU	150	1	2	2	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	BWTE	150	1	2	4	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	COGO	151	1	2	32	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	COGO	151	1	2	2	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	BUFF	153	1	2	1	5
JULY 8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	GBHE	194	1	1	1	5

JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMCO	221	1	2	4	5
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMCO	221	1	2	2	5
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	MAHA	331	1	1	1	5
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	CORA	486	1	2	3	5
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	UNDU	999	1	2	83	5
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	UNDU	999	1	2	342	5
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	UNGU	53.4	1	1	1	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	MALL	132	1	2	25	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	MALL	132	1	2	4	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	GADW	135	1	2	9	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	GADW	135	1	2	4	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	AMWI	137	1	2	4	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	SHOV	142	1	2	1	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	REDH	146	1	2	2	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	LESC	149	1	2	1	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	MAHA	331	1	1	1	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	UNDU	999	1	2	3	7
JULY	8	1450	1635	14	WINDY	0	10	34	5843	11151	1	63.46448	LESC	149	1	2	1	55
JULY	8																	
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	UNGU	53.4	1	2	2	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	BLTE	77	1	2	10	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	BLTE	77	1	2	23	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	MALL	132	1	2	87	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	GADW	135	1	2	32	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	AMWI	137	1	2	62	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	BWTE	140	1	2	6	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	SHOV	142	1	2	36	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	PINT	143	1	2	37	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	REDH	146	1	2	4	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	CANV	147	1	2	10	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	LESC	149	1	2	18	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	COGO	151	1	2	2	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	AMCO	221	1	2	45	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	MAHA	331	1	1	1	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	BAEA	352	1	1	1	2
JULY	8	1450	1635	14	WINDY	0	10	35	5845	11155	2	8.90426	UNDU	999	1	2	20	2
JULY	8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	UNGU	53.4	1	2	5	2
JULY	8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	ERGU	59	1	2	140	2
JULY	8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	COTE	70	1	2	13	2
JULY	8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	BLTE	77	1	2	98	2
JULY	8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	MALL	132	1	2	153	2
JULY	8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	GADW	135	1	2	149	2
JULY	8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	AMWI	137	1	2	96	2

JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	BWTE	140	1	2	27	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	UNTL	140	1	1	1	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	SHOV	142	1	2	23	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	PINT	143	1	2	57	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	REDH	146	1	2	14	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	CANV	147	1	2	38	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	LESC	149	1	2	27	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	RNDU	150	1	2	8	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	COGO	151	1	2	4	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	RUDU	167	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	AMCO	221	1	2	69	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	UNDU	999	1	2	686	2
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	LESC	149	1	2	26	5
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	AMCO	221	1	2	20	5
JULY 8	1450	1635	14	WINDY	0	10	38	5845	11202	2	27.98307	UNDU	999	1	2	10	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	0.00000	RNGR	2	1	1		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	FRGU	59	1	2	10	2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	COTE	70	1	2	11	2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	BLTE	77	1	50		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	MALL	132	1	132		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	GADW	135	1	2	6	2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	AMWI	137	1	201		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	BWTE	140	1	25		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	SHOV	142	1	31		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	PINT	143	1	41		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	REDH	146	1	12		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	CANV	147	1	2		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	LESC	149	1	34		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	RNDU	150	1	5		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	COGO	151	1	2	21	2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	RUDU	167	1	7		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	AMCO	221	1	114		2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	UNDU	999	1	2	120	2
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	UNGU	53.4	1	2	4	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	COTE	70	1	1	1	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	BLTE	77	1	2	16	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	MALL	132	1	2	15	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	AMWI	137	1	2	20	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	BWTE	140	1	2	3	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	SHOV	142	1	2	11	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	PINT	143	1	2	6	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	COGO	151	1	2	3	5
JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	AMCO	221	1	2	3	5

JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	UNDU	999	1	1	1	2
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	AMWI	137	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	COTE	70	1	1	1	5
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	MALL	132	1	2	5	5
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	LESC	149	1	2	16	5
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	UNDI	999.1	1	2	4	5
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	MALL	132	1	2	2	7
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	BWTE	140	1	2	1	7
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	COTE	70	1	1	1	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	BLTE	77	1	2	53	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	MALL	132	1	3	1	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	MALL	132	1	2	3	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	MALL	132	3	4		2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	GADW	135	1	2	5	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	AMWI	137	1	2	1	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	BWTE	140	1	2	4	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	SHOV	142	1	2	21	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	PINT	143	1	2	3	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	CANV	147	1	2	12	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	LESC	149	1	2	125	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	COGO	151	1	1	1	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	BUFF	153	1	2	1	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	RUDU	167	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	RNDU	180	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	AMCO	221	1	2	7	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	UNDU	999	1	2	40	2
JULY 8	1450	1635	14	WINDY	0	10	43	5849	11207	1	7.14153	UNDU	999	1	2	1	7
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	PBGR	6	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	BLTE	77	1	2	57	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	MALL	132	1	3	1	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	MALL	132	1	2	152	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	MALL	132	3	4		2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	GADW	135	1	2	62	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	AMWI	137	1	2	55	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	BWTE	140	1	3	1	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	BWTE	140	1	2	12	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	BWTE	140	3	4		2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	REDH	146	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	LESC	149	1	2	7	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	RUDU	167	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	AMCO	221	1	2	57	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	MAHA	331	1	2	1	2
JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	MAHA	331	1	2	2	2

JULY 8	1450	1635	14	WINDY	0	10	44	5838	11138	2	6.46487	UNDU	999	1	2	90	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	BLTE	77	1	2	55	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	MALL	132	1	2	195	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	GADW	135	1	2	32	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	AMWI	137	1	2	36	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	BWTE	140	1	2	64	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	SHOV	142	1	2	23	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	PINT	143	1	2	1	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	CANV	147	1	2	5	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	LESC	149	1	2	42	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	RNDU	150	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	RUDU	167	1	2	2	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	AMCO	221	1	2	40	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	UNDU	999	1	2	40	2
JULY 8	1450	1635	14	WINDY	0	10	45	5840	11134	2	8.84395	UNDA	999.2	1	2	30	2

JULY 8	1450	1635	14	WINDY	0	10	39	5847	11159	1	14.48646	UNDU	999	1	2	10	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	UNGU	53.4	1	1	1	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	MALL	132	1	3	1	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	MALL	132	3	4		2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	CANV	147	1	2	84	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	RNDU	150	1	2	13	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	RUDU	167	1	2	17	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	CAGO	172	1	3	1	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	CAGO	172	3	4		2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	AMCO	221	1	2	78	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	MAHA	331	1	1	1	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	BAEA	352	1	1	1	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	UNDI	999	1	2	30	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	UNDU	999	1	2	456	2	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	COTE	70	1	2	12	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	MALL	132	1	2	133	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	MALL	132	1	3	1	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	MALL	132	3	4		5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	GADW	135	1	2	60	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	AMWI	137	1	2	712	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	SHOV	142	1	2	46	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	CANV	147	1	2	4	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	LESC	149	1	2	27	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	RNDU	150	1	2	2	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	MAHA	331	1	1	1	5	
JULY 8	1450	1635	14	WINDY	0	10	40	5849	11203	1	34.12216	UNDU	999	1	2	26	5	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	BLTE	77	1	2	70	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	MALL	132	1	2	199	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	AMWI	137	1	2	22	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	BWTE	140	1	2	31	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	SHOV	142	1	2	29	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	PINT	143	1	2	33	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	1	7.10614	REDH	146	1	2	9	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	LESC	149	1	2	2	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	RNDU	150	1	2	1	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	RUDU	167	1	2	4	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	AMCO	221	1	3	1	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	AMCO	221	1	2	104	2	
JULY 8	1450	1635	14	WINDY	0	10	41	5849	11158	2	7.10614	AMCO	221	3	4		2	
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	BAEA	352	1	7	1	9	
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	BAEA	352	3	4	1	9	(5852 11206)
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	UNDU	999	1	2	120	2	
JULY 8	1450	1635	14	WINDY	0	10	42	5852	11206	1	10.67000	LESC	149	1	2	4	2	

APPENDIX 16

TERMS OF REFERENCE

NORTHERN RIVER BASINS STUDY

SCHEDULE OF TERMS OF REFERENCE
SURVEYS OF FISH-EATING AND OTHER BIRDS

PROJECT 236: Wildlife Contaminants 1992/93
PROJECT 2362-1: Survey of Fish-eating Wildlife

I. PROJECT DESCRIPTION

The Northern River Basins Study (NRBS) requires the contractor to coordinate and conduct aerial surveys for fish-eating and molluscivorous birds on selected stretches of the Peace and Athabasca River systems and in the Peace-Athabasca Delta.

II. TERMS OF REFERENCE

TASKS:

1. The contractor is to conduct aerial surveys of the aforementioned bird guilds at the following sites:

   i) 130 river km upstream to 130 river km downstream from the P&G mill effluent on the Wapiti and Smoky Rivers.

   ii) 130 river km upstream to 130 river km downstream from the Hinton/Welwood effluent on the Athabasca River.

   iii) 130 river km upstream to 130 river km downstream from the Daishowa mill in Peace River on the Peace River.

   iv) 130 river km upstream to 130 river km downstream from the ALPAC mill site near Athabasca on the Athabasca River.

   v) 130 river km upstream to 130 river km downstream from the Suncor plant on the Athabasca River.

   vi) The Peace-Athabasca delta following breeding bird survey routes flown during the P-A delta study during the 1970's (see Nieman and Dirschl 1973, Canadian Wildlife Service, Occasional Paper No. 17). The contractor will have to modify these routes in order to complete the P-A delta survey within the allowable time frame (see below). In addition to aerial surveys in the P-A delta, the contractor will arrange to conduct bird surveys from powerboat(s) on portions of the delta that were not covered in the aerial surveys but were surveyed in the 1970's (see CWS reference above).

The P-A delta survey should include all or portions of major bodies of water which are considered active or depositional sites as well as semiactive depositional sites which have not dried up since the 1970's (Dirschl, 1973, Peace-Athabasca Project, Technical Appendices, Volume 2; Peace-Athabasca Delta Project, Technical Report, Chapter 6, 1973), including the Chenal des Quatre Fourches, the Revillon Coupe, Mamawi Lake, Pushup Lake, Egg Lake, Baril Lake, Hilda Lake, Otter lake, Sonny's (Four Forks) Lake, Richardson Lake, Blanche Lake, the Embarrass River, Fletcher's Channel, and Big Point Channel. Other, smaller, unnamed lakes and ponds in proximity to the preceding bodies of water should also be surveyed.

For the purposes of these surveys, fish-eating and molluscivorous birds refer to the following groups of birds: loons, grebes, herons, cormorants, pelicans, gulls, terns, eagles, ospreys, mergansers, ducks, and kingfishers. Other species of aquatic birds, including shorebirds, blackbirds and swallows should be noted during the course of the surveys; however, time and effort should not be expended on these latter groups at the expense of completing the survey within the allowable time frame at each site.

2. The contractor is to coordinate and organize these surveys.

3. The contractor is to provide details of methodology and procedures, including detailed survey routes, to the NRBS before commencement of the surveys.

METHODS/APPROACH:

1. Project coordination and organization:

The contractor must ensure that written authorization to do the surveys is received from the appropriate agencies, where necessary (Wood Buffalo and Jasper National Parks). The contractor is to engage appropriate air charter services at each site. For sites (i) to (v) (see above), appropriate air charter service refers to the equivalent of a Bell-206 Jet Ranger capable of carrying 4 passengers, and equipped with 4 sets of headphones, bubble windows in the back, and on skids. For site (vi) a STOL-equipped fixed-wing aircraft is appropriate. In addition, the contractor will ensure that an outboard-powered boat is available for additional survey work in the P-A delta. The contractor is to plot detailed survey routes on 1:50,000 topographic maps for the individual sites referred to above (see TASKS); in designing these routes, the contractor should allow for approximately 4 hours of flying time at each of sites (i) through (v) and approximately 7 hours of flying time in the P-A delta. The contractor will correspond with repre-

sentative(s) of the NRBS when selecting the survey routes. In planning survey routes in the P-A delta, persons/agencies with knowledge of current hydrological conditions in the P-A delta should be consulted.

Conducting surveys:

The contractor will employ a navigator, and two observers, one on each side of the aircraft. Surveys should be done by following shorelines. On the mainstem rivers, this will involve surveying one shoreline for the designated distance (see TASKS), then turning around and following the opposite shoreline back to the point of origin. Whenever possible, perimeters of islands should also be surveyed. All birds will be identified to species and counted, where possible. However, emphasis will be placed on the fish-eating and molluscivorous groups referred to above. The sex, age and social status of each bird should also be determined where possible. Birds which are young-of-the-year should be distinguished from juvenile or adult birds where possible. Also, where possible, young-of-the-year should be aged according to established techniques. Also, pairs should be distinguished from lone birds. All bird observations should be plotted on the 1:50,000 survey maps using preestablished codes. If nests or breeding colonies are seen, their locations should be noted on the survey maps as exactly as possible. Attempts should be made to distinguish between active and inactive nests (for species such as eagles and ospreys) and to count the number of nests in breeding colonies. It is imperative that the aircraft not go close to or linger for several minutes near raptor nests.

III. REPORTING REQUIREMENTS

1. The contractor will supply a preliminary report before the surveys are done, providing details regarding authorizations, arrangements with air charter services, arrangements for work in the P-A delta, and survey route maps for approval by NRBS. Sources of information that were used in this planning stage should also be identified.

2. The contractor will provide a final report (2 copies, one to NRBS, and one to Scientific Authority, see VII below) detailing methodology, and results. The results should include a record for each observation of a fish-eating or molluscivorous bird or its nest. Each record should consist of the following variables i) site identification, ii) date iii) species iv) sex, v) age, vi) social status, vii) number of adult or juveniles, viii) number of young-of-the-year, ix) total number, and finally any notes that may be appropriate such as the number of nests, etc. Included within this final report should be a summary of all bird sightings by site (see TASKS, above), distinguishing upstream from downstream portions for each of sites (i) through (v). The survey route maps on which the bird sightings were plotted should be appended to this report.

Records of bird observations should be supplied in both hard-copy format and on DOS-formatted diskette.

IV. SCHEDULING

1. Complete initial report by June 12, 1992.

2. Conduct surveys between June 29, 1992 and July 13, 1992.

3. Provide final report by August 29, 1992.

VI. COMPLETION DATE

August 29, 1992.

VII. SCIENTIFIC AUTHORITY

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VIII. CONTRACTOR'S ADDRESS

IX. RECOMMENDED BUDGET

$27,000.00 of which approximately $18,500.00 will be earmarked for subcontracts with Air Charter Services. The remainder will be for travel, living expenses, and payroll. Please note that this survey effort should be considered as minimal. Yet, it is likely the maximum effort that is attainable while keeping within the $100K framework for the Wildlife Contaminants Project for 92/93 and fulfilling our other commitments to this project. In order to improve the overall survey effort, a proposal has been made to Wood Buffalo National Park by Mark Wayland of CWS to provide funds (3.0K) to augment the surveys in the P-A delta. Their decision is pending.

Payment Schedule:

The contractor should be paid $13,500.00 on the date that the contract is signed. The intention of this advance payment is to help defray the financial commitments associated with contracting Air Charter Services. The remaining $17,000.00 will be paid upon completion of the contract (August 29, 1992). Provision should be made for making the final payment at an earlier date, should the final report be submitted, reviewed and deemed acceptable before the August 29 deadline. Alternatively, the NRBS Study Board may wish to contract the Air Charter Services directly and have a separate contract valued at $8,500.00 for the bird survey work.