

FINAL REPORT

WESTERN CANADA CO-OPERATIVE WATERFOWL BANDING PROGRAM AT LOCHE LAKE MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES - AUGUST 1995.

PERSONNEL: Richard Popko - Wildlife Technician; Department of Renewable Resources,
Government of the Northwest Territories, Norman Wells, NT

Edward Yakeleya - casual employee, hunter, trapper, and elder; Tulita, (Fort
Norman), NT.

Robert G. Bromley - Waterfowl Biologist, Department of Renewable Resources,
Government of Northwest Territories, Yellowknife, NT

ABSTRACT:

This was the first successful attempt at duck banding at Loch Lake (65° 19' N; 125° 40' W) in Stratum 14, Mackenzie River Valley, N.W.T. The banding site is situated about 30 miles (48 km) equidistant between Norman Wells and Tulita (Fort Norman). During a 20-day period (Aug. 2 to Aug. 21, 1995) seven funnel traps were set for 119 trap-nights yielding 509 dabbling ducks for banding and one recaptured Green-Winged Teal (*Anas crecca*). The banded ducks consisted of 269 Mallards (*Anas platyrhynchos*), 106 Northern Pintail (*Anas acuta*), 123 Green-Winged Teal (*Anas crecca*), 10 American Wigeon (*Anas americana*), and 1 Northern Shoveler (*Anas clypeata*). A trap mortality of 5.9% (30 ducks) was due to predation by three mink (*Mustela vison*). Fifteen hundred pounds (680 kg) of, cleaned barley was used as bait. Duck banding totals were limited by the availability and quantity of bait. We also identified potential banding sites at nearby Brackett Lake (also known as Willow Lake) and the sewage lagoon at Norman Wells.

BACKGROUND:

The North American duck banding program's goal for Stratum 14 of the surveyed area is 800 Mallards and 400 Northern Pintails. However, despite an early pioneering attempt by Bob Smith in the mid-1960s (R. Smith, pers. commun.), no ducks have been banded in this stratum prior to 1995.

In response to increasing interest in harvest derivation of ducks produced in the northwestern regions of the NWT by the Government of the Northwest Territories, a proposal to band ducks in Strata 13 and 14 was submitted to the two western flyway councils for consideration of cooperative financial support. With subsequent support from the Pacific Flyway Study Committee, the US Fish and Wildlife Service, and information on potential banding sites from Dave Kay of Ducks Unlimited (Canada), Yellowknife, NT, the project was launched. Banding sites in the area of Loch Lake and Willow Lake were selected and the appropriate equipment and materials were ordered.

In June 1995 a meeting was held in Tulita with representatives from the Tulita Renewable Resources Council, Ducks Unlimited (Canada) and the Government of the Northwest Territories. Strong public interest and support was evident from the concern that the Tulita Renewable Resources Council showed for the apparent decline in the local duck populations. Local traditional knowledge was identified as a vital link to the success of this local banding program. The Tulita Renewable Resources Council selected a suitably qualified candidate, Edward Yakeleya, to assist with the banding project.

NARRATIVE:

Project success required a combination of logistical coordination and good luck. Camp supplies, fuels, and food were purchased locally. Trap-wire and supplies were air-freighted to Norman Wells at the last minute due to a delay in shipping. The bait, 1500lbs (680kg) of barley, was barged to Norman Wells from Hay River in late July. On August 2 everything was finally ready to go to the bush. A small airplane on floats was chartered to transport Edward Yakeleya and his effects to Kelly Lake from Tulita. Meanwhile, R. Popko chartered two single Otter (DeHavilland DH-6) float-plane trips to haul a boat, motor, tent camp, supplies, fuel, trap-wire, and bait from Norman Wells to Kelly Lake. Kelly Lake was selected as the base camp location as it was the closest known reliable place to safely land a float plane. The Loche River water level was too low to permit water access from the Great Bear River. Also, there is no road access into the area. Communications were limited to a single side-band radio (5031 MHz) that allowed communication with other bush radios. The radio-telephone could not connect with the *Northwest Tel* repeaters. Daily trips were made to Loche Lake by boat using an outboard motor, poling, and by hand-lining the boat along the Loche River.

Low water levels persisted during this third consecutive year of drought conditions in the area. Loche Lake and Brackett Lake progressively dried up into mudflats and interconnected pools filled with aquatic plants. There was an estimated 2000 ducks in the area. The Loche River supports an abundant summer population of whitefish (*Coregonus spp.*) and inconnu (*Stenodus leucichthys*). Bald eagles (*Haliaeetus leucocephalus*), peregrine falcons (*Falco spp.*), mink, wolves (*Canis lupus*), otter (*Lutra canadensis*), and black bears (*Ursus americanus*) are attracted to the abundance of fish and fowl.

Daily during the first five days we would assemble a trap or two at camp and then haul it to Loche Lake, scout the area for trap sites, prepare trap sites by slashing openings into the horsetail (*Equisetum spp.*) mats, and bait the site. The trap funnels were kept closed until August 6.

Two types of traps were used. The B-2 collapsable traps were constructed according to plans drafted by Doug Benning, U.S. Fish and Wildlife Service, with additional comments from Dan Nieman, Canadian Wildlife Service. These traps were made from 1"x2" (2.5 cm x 5.0 cm) welded wire, and they enclosed an area of 8'x8' (2.4 m x 2.4 m) with a 4' (1.2 m x 1.2 m) high wall. An interior floating plywood loafing area allowed the ducks to stay reasonably dry. Spruce poles were driven into the mud to secure the corners. These traps performed well for capturing both Mallards and Pintails.

The other trap design we tried was a heart-shaped funnel trap. A single 25' (7.6 m) piece of 1'x1' (2.5 cm x 2.5cm) welded wire mesh was wrapped around corner poles to form the upright walls.

This was covered with a sheet of the same wire mesh. It was portable, easy to construct, and caught most of our Teal. Mallards and Pintails would feed on the bait beside the trap, but they would not enter it.

Each of the traps was cached in the bush adjacent to their 1995 trap site location. All of the borrowed camp equipment and supplies were returned to Renewable Resources, Norman Wells and Tulita. If this project is to continue we need to acquire and position a small boat on Loche River and a shallow draft, small paddling canoe at Loche Lake. Boats, trap-wire, and some hardware could be hauled to the site by snowmachine during the winter to substantially reduce air-craft charter costs.

A holding box made of 1" x 1" (2.5 cm x 2.5 cm) wire into a 3' x 2' x 2' (0.9 m x 0.6 m x 0.6 m) container was used to remove ducks from the trap for handling and banding. Some ducks chafed their beaks against the wire mesh in the traps and in the box. Any suggestions toward the reduction or elimination of this problem would be welcome.

Barley was an effective bait. Baiting attracted an ever-increasing number of ducks throughout the banding period. Trapping success steadily increased after August 7 and peaked on August 14, coincident with the waning of the full moon of August 10. All captured ducks were banded. After mid-August local fledglings were very active. Conditioned ducks returned continuously to the traps to feed on the bait. Our supply of barley, 1500 lbs. (680 kg), was insufficient to attract enough ducks into the traps to achieve our banding targets.

Trap success varied with the trap type and site. Traps located in horsetail mats attracted the most Mallards. Pintails were caught primarily in sites adjacent to Loche Lake. Most of the Teal were trapped in a backwater on the Loche River.

American Wigeon and Northern Shoveler were common in the Loche Lake area; however, they were only caught incidentally and in small numbers (Table 1). The sex ratios for the hatching year (HY) age-class of Mallards, Green-Winged Teal, and Northern Pintails are approximately equal. The sex ratio for adult (after hatching year age-class; AHY) Mallards and Teal were different. Male Mallards outnumbered females four to one. There were three times more female Green-Winged Teal than males.

Twice as many young-of-the-year Mallards were banded as compared to adult Mallards (Table 2). Adult and young-of-the-year Green-Winged Teal were banded in approximately equal numbers. There were two times more young Northern Pintails banded than adults.

RECOMMENDATIONS:

1. Continue the duck banding program at Loche Lake in 1996 with a two-person crew for the month of August. Set up a tent base camp at the outlet of Loche Lake. Travel to the area by aircraft on floats that can land at near-by Loche Lake-Lake ($65^{\circ} 19' N$; $125^{\circ} 38' W$), or at the outpost camp at Brackett Lake.
2. Increase the barley order to 4000 lbs. (1812 kg); 2200 lbs. (997 kg) for Loche Lake, 1000 lbs. (453 kg) for Brackett Lake, and 800 lbs (362 kg) for Norman Wells. Obtain two rolls of 1" x 2" (2.5 cm x 5 cm) welded wire to make three new B-2 traps for Brackett Lake ($65^{\circ} 13' N$; $125^{\circ} 25' W$).
3. Establish a new banding site at the inlet to Brackett Lake. Alternate banding effort between Loche Lake and Brackett Lake sites during August.
4. Offer the opportunity for Tulita students to obtain experience at duck banding as part of their Land Skills Program at Brackett Lake.
5. Consider establishing a small banding station (two B-2 traps) at the Norman Wells sewage lagoon ($65^{\circ} 18' N$; $126^{\circ} 50' W$) with the voluntary assistance of the Norman Wells Fish, Gun, and Game Association.

ACKNOWLEDGEMENTS:

We appreciated Wilbert Menacho's (President, Tulita Renewable Resources Council) assistance in setting up a public meeting in Tulita. Dave Kay, Ducks Unlimited (Canada) shared his waterfowl observations of the Loche Lake area. Blair Jensen, pilot and manager of *Ursus Aviation* (Tulita), and Ken Williams, pilot and manager of *Williams Aero Services* (Norman Wells), provided capable and safe passage to and from the banding site despite the smokey sky conditions. Louis Marion, Renewable Resources Officer (Department of Renewable Resources) in Tulita, loaned us a boat and motor. Alasdair Veitch, Regional Biologist, Department of Renewable Resources (Norman Wells) edited an earlier version of this report and provided area guidance and supervisory support for the field crew. Dan Nieman, Canadian Wildlife Service, provided a sample duck trap from Saskatoon.

Funding was provided by the Northwest Territories Department of Renewable Resources, the Pacific Flyway Study Committee, and the United States Fish and Wildlife Service. Thanks also to Jim Voelzer, Doug Benning and John Solberg for planning assistance.

Table 1 . Age and sex composition of the ducks banded at Loche Lake and Loche River, N.W.T., August 1995. HY-hatching year age class; AHY-after hatching year age class.

Species	Males		Females		Totals
	AHY	HY	AHY	HY	
Mallard	70	85	17	97	269 (53 %)
Green-Winged Teal	15	30	51	27	123 (24%)
Northern Pintail	0	41	5	60	106 (21%)
Northern Shoveler	0	0	0	1	1 (0%)
American Wigeon	0	7	1	2	10 (2%)
Totals	85	163	74	187	509 (100%)

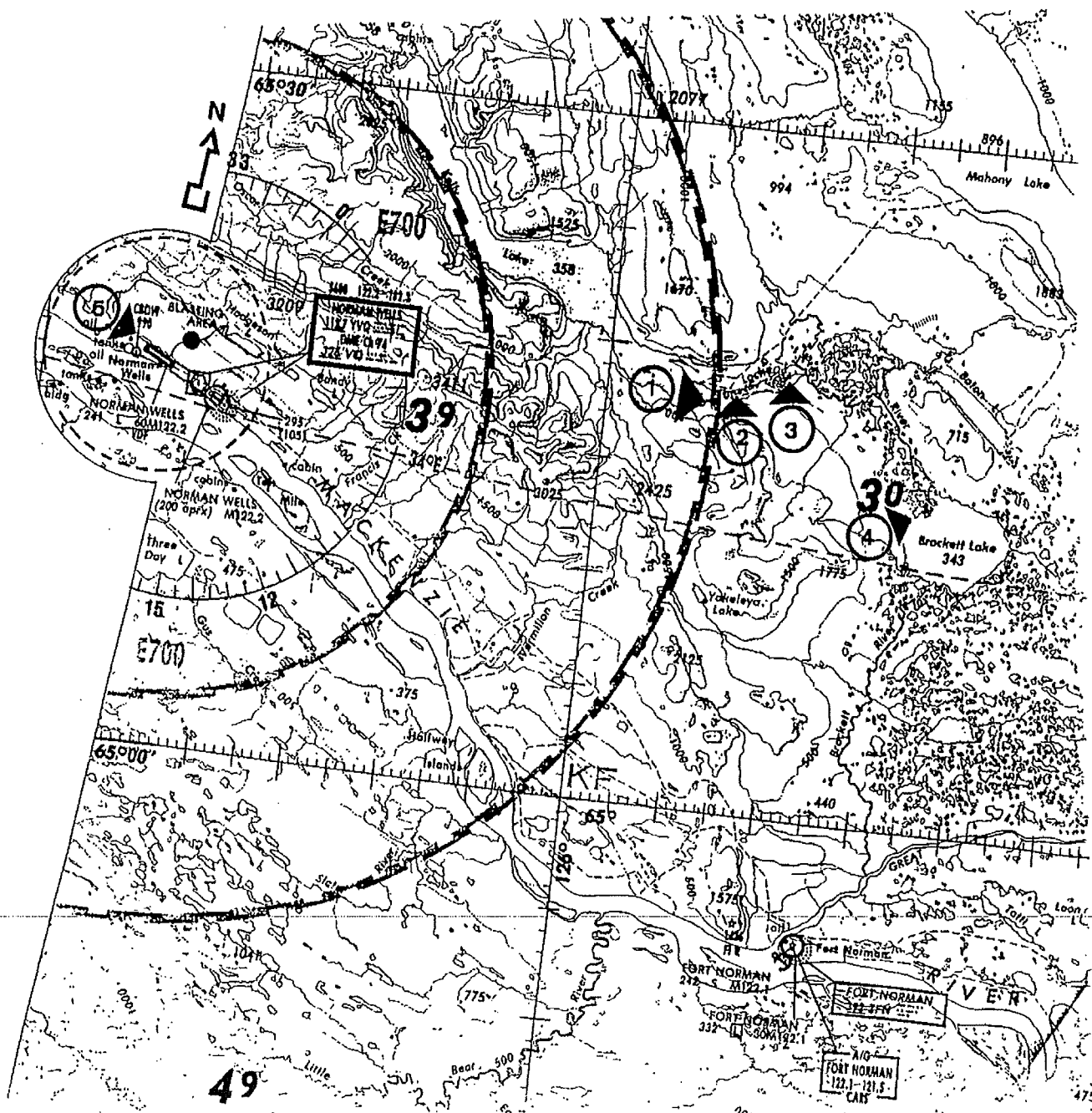
Table 2 . Age-class numbers and percentages of ducks banded at Loche Lake and Loche River , N.W.T., August 1995.

Species	HY		AHY		Totals
	N	%	N	%	
Mallard	182	68	87	32	269
Green-Winged Teal	57	46	66	54	123
Northern Pintail	101	95	5	5	106
Northern Shoveler	1	100	0	0	1
American Wigeon	9	90	1	10	10
All species combined	350	69	159	31	509

Figure 1. Locations of 1995 banding sites in Region 14.
 Taken from VFR Navigation Chart Great Bear Lake.
 Scale 1:500,000

KEY:

- 1 Kelly Lake base camp
- 2 Loche River banding site
- 3 Loche Lake banding site
- 4 Proposed Brackett Lake banding site
- 5 Proposed Norman Wells banding site



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Richard Popko - Wildlife Technician, Dept. of Resources, Wildlife, and Economic Development (DRWED), Government of the Northwest Territories (GNWT), Norman Wells, NT.

Edward Yakeleya - Tulita Renewable Resource Council, Tulita, NT.

Dean Doctor - Tulita Renewable Resource Council, Tulita, NT.

Alasdair Veitch - Regional Wildlife Biologist, DRWED, GNWT, Norman Wells, NT.

Robert G. Bromley - Waterfowl Biologist, DRWED, GNWT, Yellowknife, NT.

ABSTRACT:

1996 was the second consecutive year that the Tulita (a.k.a. Fort Norman) Renewable Resource Council, the Government of the Northwest Territories Department of Resources, Wildlife, and Economic Development (DRWED), the Pacific Flyway Council, and the United States Fish and Wildlife Service cooperated in the North American Waterfowl Banding Program. The Program's goal for Mallards (N=800) and Northern Pintails (N=400) for Stratum 14, Mackenzie River Valley, N.W.T., was achieved, and surpassed, for the first time in 1996. Due to high water levels the banding site was moved from Loche Lake (1995 location) to Willow Lake (65°14' N; 125°25' W; a.k.a. Brackett Lake) situated in the Loche River watershed, about 40 km (24 miles) north of Tulita. Trapsite selection was based upon local Dene traditional environmental knowledge (TEK) and greatly enhanced the program's success. During a 22-day period (Aug 09 - 30, 1996) a maximum of 17 funnel traps were set for 195 trap-nights. A total of 1892 dabbling ducks were banded: 1126 Mallards (*Anas platyrhynchos*), 733 Northern Pintail (*A. acuta*), 29 Green-Winged Teal (*A. crecca*), 3 American Wigeon (*A. americana*), and 1 Northern Shoveler (*A. clypeata*). Recaptured and released foreign-banded ducks consisted of 12 Mallards and 7 Northern Pintails; one foreign-banded Northern Pintail was killed by a Timber Wolf (*Canis lupus*). A major difference between 1996 and 1995 occurred in the number of hatching year age-class (HY) ducks that were captured and banded - 69% (N=350) of banded ducks were HY in 1995, whereas only 12% (N=220) were HY in 1996. We hypothesize that high water levels and a late spring thaw in 1996 lead to the apparent tremendous drop in Mallard and Northern Pintail production in Stratum 14. Moulting, non-breeding, after hatching year age-class (AHY) Mallards and Northern Pintails were abundant this year. In 1995 Green-Winged Teals comprised 24% of all ducks banded in Stratum 14; this declined to 2% in 1996. Overall capture-related mortality was 4.7% (N=89) and was primarily (80.9%) due to predation by Timber Wolves (N=72). Other causes of death were Mink (*Mustela vison*) predation (N=12), exposure (N=4), and interspecific aggression (N=1). A total of 2045 kg (4500 lb) of cleaned barley was used as bait. The number of ducks banded in Stratum 14 in 1996 is an increase of 1383 over 1995; the increase was likely a result of our using 7 more funnel traps, 1365 kg more bait, and TEK to properly focus the banding effort. We anticipate that the Tulita Renewable Resources Council, DRWED, and the United States Fish and Wildlife Service will continue this successful co-management project at the same site in 1997.

Table 1. Age and sex composition of the ducks banded at Brackett Lake, N.W.T., August 1996. Age-class designations: L - unfledged (i.e., flightless) local hatching year birds, HY - fledged (i.e., can fly), hatching year birds; AHY - after hatching year (i.e., adult) birds.

Species	Males			Females			Total
	AHY	HY	L	AHY	HY	L	
Mallard	772	2	0	350	2	0	1,126 (59%)
Northern Pintail	199	97	0	333	104	0	733 (39%)
Green-winged Teal	2	7	3	8	8	1	29 (2%)
American Wigeon	3	0	0	0	0	0	3 (0%)
Northern Shoveler	0	0	1	0	0	0	1 (0%)
Total	976	106	4	691	114	1	1892

Table 2. Age-class numbers and percentages of ducks banded at Brackett Lake, N.W.T., August 1996. Age-class designations as in Table 1.

Species	L	HY		AHY		Total
	N	N	%	N	%	
Mallard	0	4	0	1122	100	1126
Northern Pintail	0	201	27	532	73	733
Green-winged Teal	4	15	52	10	34	29
American Wigeon	0	0	0	3	100	3
Northern Shoveler	1	0	0	0	0	1
Total	5	220	12	1667	88	1892

Table 3.

A comparison between 1995 and 1996 duck banding totals by species and age-class in stratum 14, Mackenzie River Valley, N.W.T. Age-class designations as in Table 1. The percent of the total banded is presented in parentheses.

Species	L		HY		AHY		Total	
	1995	1996	1995	1996	1995	1996	1995	1996
Mallard	0	0	182 (68%)	4 (0%)	87 (32%)	1122 (100%)	269 (53%)	1126 (59%)
Northern Pintail	0	0	101 (95%)	201 (27%)	5 (5%)	532 (73%)	106 (21%)	733 (39%)
Green-winged Teal	0	4 (17%)	57 (46%)	15 (52%)	66 (54%)	10 (34%)	123 (24%)	29 (2%)
American Wigeon	0	0	9 (90%)	0	1 (10%)	3 (100%)	10 (2%)	3 (0%)
Northern Shoveler	0	1 (100%)	1 (100%)	0	0	0	1 (0%)	1 (0%)
Total	0	5 (0%)	350 (69%)	220 (122%)	159 (31%)	1667 (88%)	509 (100%)	1892 (100%)

NARRATIVE.

Four of the five recommendations made in the 1995 Loche Lake (Stratum 14) Waterfowl Banding Report (Popko et al. 1995) were implemented in 1996 and each contributed to the success of this year's project:

1. The banding station was moved from Loche Lake to Willow (Brackett) Lake.
2. The quantity of bait (barley) was increased from 680 kg to 2045 kg (4500 lb).
3. The number of B-2 collapsible funnel traps was increased from seven to 14.
4. Dean Doctor of Tulita was trained as a duck bander and data recorder.

Willow Lake is called *K'alotue* in the North Slavey language of the Sahtu Dene and is also sometimes known locally as Brackett Lake. An outpost camp is located at the mouth of the Loche River at Willow Lake and Sahtu Dene, known as Willow Lake People, have camped here since time immemorial and continue seasonal subsistence harvesting in the area. Access and activities on this selected land parcel are subject to the terms and conditions outlined in the *Sahtu Dene and Metis Comprehensive Land Claim Agreement* (1993). The potential of Willow Lake as a banding area was confirmed by the Tulita Renewable Resource Council.

Camp supplies, food, and fuel for the project were purchased in Norman Wells and Tulita. The 2000 kg of bait was trucked to Hay River NT, barged to Norman Wells, and arrived 12 Aug. Forest Operations of DRWED provided personnel to construct seven new B-2 duck capture traps, loaned some camping equipment, and flew bait, traps, fuel, supplies, and personnel to Willow Lake between 8 and 12 Aug.

On 09 Aug EY and DD arrived at Willow Lake by jet boat from Tulita. A 3.7 m (12 ft) aluminum boat with a 9.9 hp outboard motor and a 4.9 m (16 ft) aluminum boat with a 35 hp motor (owned by EY) were used for local travel. Reconnaissance of Loche Lake and Loche River on 10-11 Aug indicated that water levels were high, very few ducks were using the 1995 Loche Lake banding sites, that Willow Lake was the primary waterfowl feeding area, and it was navigatable. All traps and camp supplies cached at the Loche Lake site in 1995 were hauled to the north-west section of Willow Lake by boat at this time.

Cabins belonging to Lucy Doctor of Tulita and DRWED provided suitable accommodation at Willow Lake. The weather during August 1996 was wet and cool, so the comfort of the warm and dry cabins served to greatly reduce daily chores (e.g., cooking, drying clothes) and enabled the crew to maximize their efforts towards catching and banding ducks.

Daily communication with Tulita was maintained over the bush radio network using a single-side-band HF radio (5031 MHz). However, weather conditions affected mobile-radio communications with DRWED in Norman Wells - mobile telephone service was unreliable from our base camp but was acceptable from Willow Lake when operated in direct line-of-sight with the *Northwest Tel* repeater on Bear Rock near Tulita.

Edward Yakeleya's extensive knowledge of the area, based upon generations of Willow Laker's experience as resource harvesters, enabled the quick and efficient selection of new banding sites and no time was wasted in 1996 in trapping suboptimal areas. Known waterfowl feeding areas with suitable water depth and substrate hardness for the traps and shelter for the ducks once they were captured were selected based on EY's knowledge.

Trapsite preparation entailed cutting the emergent aquatic vegetation, primarily Horsetails (*Equisetum spp.*), by scythe and then piling it on the edge of the trapsite clearing. This provided boat access to the trap and loafing areas for the ducks. After each trap was set on site, bait was scattered within a ca. 30 m area to attract ducks. During the prebaiting period the trap funnels were kept closed until all the traps were operational. Between seven and 17 traps were set, rebaited, and checked at least daily between 16 and 29 Aug for a total of 195 trap-nights. Slight modifications to some traps were made to improve their catch efficiency and reduce the potential of any harm to captured ducks. A 10 m length of wire mesh, perpendicular to the trap from the entrance of the funnel, appeared effective in directing swimming ducks into the trap. Plastic poultry netting as B-2 trap roofing material seemed to reduce the amount of abrasion seen on captured ducks.

An average of 10 kg of barley per trap-night was an effective bait and sufficient feed for the captured ducks. Mallards and Northern Pintails entered the B-2 traps readily. The smaller funnel traps were not as efficient and we recommend that in 1997 they should be dismantled and used for leads or repairs to the more effective B-2 traps. American Wigeon were plentiful on Willow Lake but they were not attracted to the barley. However, as Wigeon are not a target species for this project we did not make any attempt to try to increase our catch of Wigeon.

We recognized three 'age-classes' of ducks:

- 1) AHY - after hatching year, or adults.
- 2) L - local birds, or birds that were born in the current year and cannot fly. These birds are normally less than 4-weeks-old and are the result of a second clutch.
- 3) HY - hatching year, or birds that were born in the current year and can fly. These birds are normally more than 4-weeks-old and are the result of the first clutch.

Trapping success peaked on 19 Aug when 332 ducks were banded, which represents a catch-per-unit-effort (CUE) of 19.5 ducks banded per trap-night. Between 16 and 29 Aug the average CUE was ca. 10 ducks banded per trap-night. The age and sex ratios of the banded ducks varied with time: initially the catch was primarily AHY males, followed by AHY females, and then local and HY ducks at the end of August. Green-Winged Teal were primarily observed during the prebaiting period and only a few were caught during the first few days of trapping as they migrated through the area. Canada Geese (*Branta canadensis*) started to migrate into the area on August 20. Greater White-Fronted Geese (*Anser albifrons*) arrived by the thousands during late August and stayed until mid-September. Tundra Swans (*Cygnus columbianus*) also staged on Willow Lake from late August until freeze-up.

Local production of Mallards and Northern Pintails appeared to be very low in 1996. Very few broods of Mallards, Green-Winged Teal, or Northern Pintails were seen. Ninety-nine percent of the banded Mallards and 73% of the banded Northern Pintails were in the AHY age-class. Sixty-nine percent of the banded Mallards and 27% of the banded Northern Pintail catch were males. We hypothesize that the apparent poor production in 1996 compared to 1995 (68% and 46% of Mallards and Green-winged Teal banded, respectively, were HY) was a result of high water levels and a wet, late spring thaw this year.

Capture-related mortality was at least 4.6% (N=89). Twenty-four of these ducks had been banded at Willow Lake this year (recorded as 'band destroyed'), and one duck was a foreign-banded Northern Pintail. Timber Wolves (*Canis lupus*) were the major cause of mortality and they killed at least 72 ducks inside the B-2 traps. Wolves destroyed one trap and subsequently learned how to enter and exit these traps through the funnel. Mink (*Mustela vison*) were a relatively minor cause of mortality (4.5% of all mortalities) this year in comparison to 1995 when 100% of mortality (N=30) among captured ducks was attributed to predation by three mink (Popko et al. 1995). We believe that we were successful in reducing mink predation by setting four Tomahawk live traps at some of the trap-sites. Seven Mink were live trapped, relocated, and released. Predated traps (wolf or mink) were immediately removed and some were reset further from shore.

One occurrence of interspecific aggression was observed. A single HY Northern Pintail was floating inside a B-2 trap with its beak pointing downwards and facing away from a group of about 45 Mallards, which were also within the trap. Over the course of ca. 1 h we observed that several of the Mallards took turns pecking at the back of the Northern Pintail's head until it eventually died. The Pintail made no obvious attempt to escape or defend itself.

Bait-conditioned ducks returned regularly to the traps. During late August about 400 ducks were handled daily and by 29 Aug they had consumed all our available bait. Boat access at this time was becoming restricted by declining water levels in Willow Lake. Since the project objective had been attained, we decided to cease trapping on this date. Some of the traps were cached near trap sites that would be accessible by boat in 1997 and the rest (from shallower areas) were cached on the shore of Loche River about 400 m downriver from camp where short-take-off-and-landing float planes can land. The 3.7 m boat was left at camp and the remainder of the field gear was returned to Norman Wells.

Over the course of this year's field work DD was taught to identify local duck species and to classify them to age and sex. He was also taught how to correctly record the banding data on standard USFWS banding forms. This training will be valuable if the project continues in 1997 as a contract with the Tulita Renewable Resource Council.

RECOMMENDATIONS.

- 1) The Willow Lake site should be considered as a permanent waterfowl banding station as TEK strongly suggests that the duck banding objectives for Stratum 14 can be achieved here on an annual basis.
- 2) With the financial support of the USFWS, the Wildlife and Fisheries Division of DRWED in Norman Wells could help with administering a contract with the Tullita Renewable Resource Council for the delivery of duck banding services at Willow Lake in 1997, with a three-person banding crew from Tullita between 01 and 30 Aug to provide accurate and complete banding schedules. The annual report would be compiled and written by DRWED personnel in Norman Wells.
- 3) Order 1590 kg (3500 lb) of barley as soon as possible in April so that it can arrive in sufficient time (July) at Norman Wells. Adjust bait practice so that 1590 kg is sufficient for the entire trapping session.
- 4) Charter locally available float-equipped short take-off and landing aircraft, such as a *Maule* or *Plateus Porter*, to transport personnel, field gear, and bait to Willow Lake.
- 5) Continue to live-trap and relocate Mink to reduce trap-related mortality.
- 6) Add a 10 m plastic poultry mesh lead to each B-2 Trap.
- 7) Include the following items in the field equipment list: scythes (2), plastic ties (2500), a tarp to cover the duck holding box, and gasoline (2 drums).

REFERENCES:

- Popko, R., E. Yakeleya, and R. G. Bromley. 1995. Western Canada co-operative waterfowl banding program at Loche Lake, Mackenzie River Valley, Northwest Territories - August 1995. Final Report prepared for Pacific Flyway Council. 6 pp.
- Sahtu Dene and Metis Comprehensive Land Claim Agreement. 1993. Sahtu Tribal Council, Dept. of Indian Affairs and Northern Development, and the Government of the Northwest Territories. 126 pp. and four appendices.

ACKNOWLEDGEMENTS:

We appreciate the continuing community support and vision for this program as demonstrated by the Tulita Renewable Resources Council. Denver Clement followed his grandfather (EY) to learn bush skills and assisted with the duck handling. Garry Yakeleya provided jet boat transportation to Willow Lake from Tulita, and the temporary use of his outboard motor. Joe Bernarde, Victor Menacho, and Valerie Yakeleya maintained radio communications with the field crew. Lucy Doctor and family allowed the use of their cabin at Willow Lake.

Gerry LePrieur, Sahtu Region Superintendent (DRWED) in Norman Wells authorized use of the Willow Lake Patrol Cabin, departmental resources, and staff-time. The following DRWED employees in Norman Wells assisted with the project: Paul Rivard (Forest Fire Protection Officer) co-ordinated aircraft, Tanya Townsend (Fire Clerk) operated the radio; Tim Melnyk (Warehouse Storeperson) assisted with warehouse supplies, and Martin Rojek (Norman Wells Fire Crew) pre-cut and assembled the new B-2 traps. Rod Brook, Waterfowl Technician (DRWED, Yellowknife), assisted with pre-season preparation and input the computerized banding schedules submitted to the Bird Banding Laboratory.

Dave Kay, Ducks Unlimited (Canada), shared his banding experience and waterfowl observations of Willow Lake.

Pilots Peter Kelly (*Canadian Helicopters*) and Blair Jensen (*Ursus Aviation*) demonstrated their ability to get the banding crew and supplies safely into camp and home again.

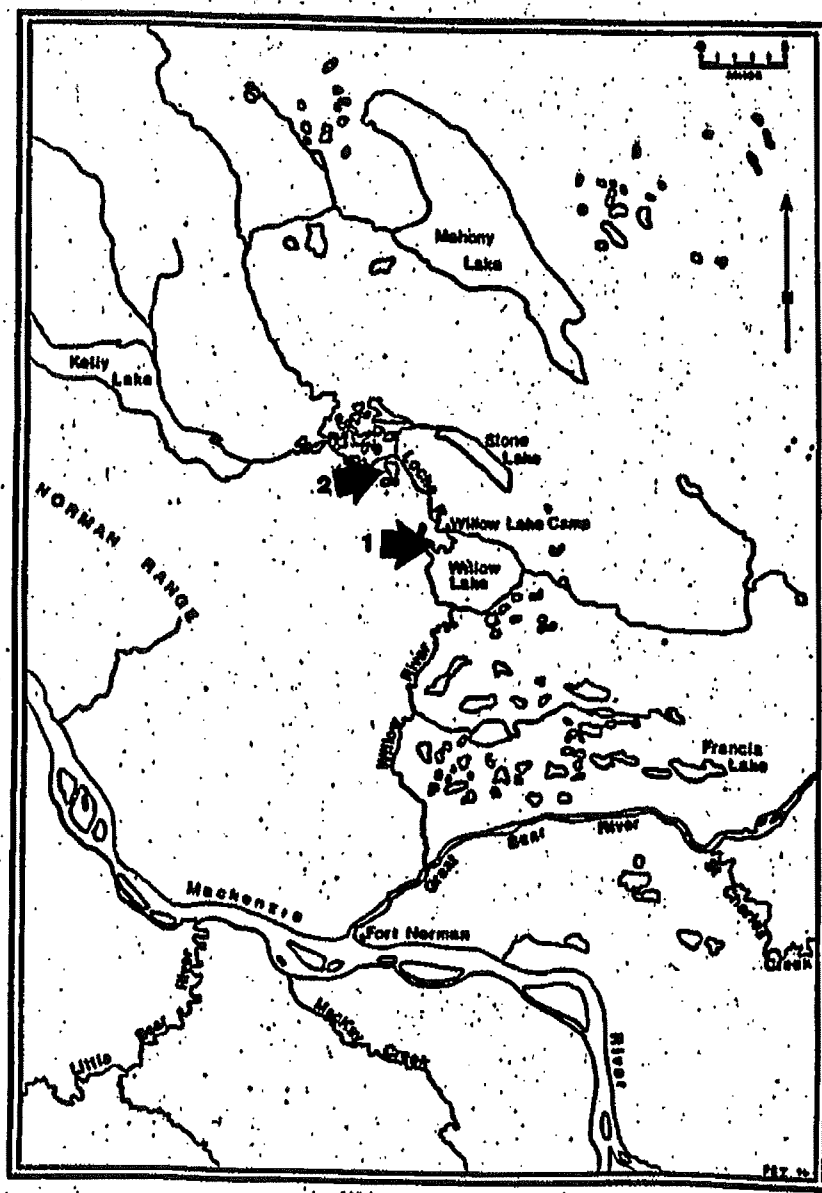
Funding and logistical assistance was provided by the the Pacific Flyway Council, the Tulita Renewable Resource Council, the United States Fish and Wildlife Service, and the DRWED. Planning assistance was provided by Doug Benning, John Solberg, and Jim Voelzer.

Figure 1. Location of the Stratum 14 duck banding location at Willow (Brackett) Lake in the Mackenzie River Valley, Northwest Territories, August 1996.

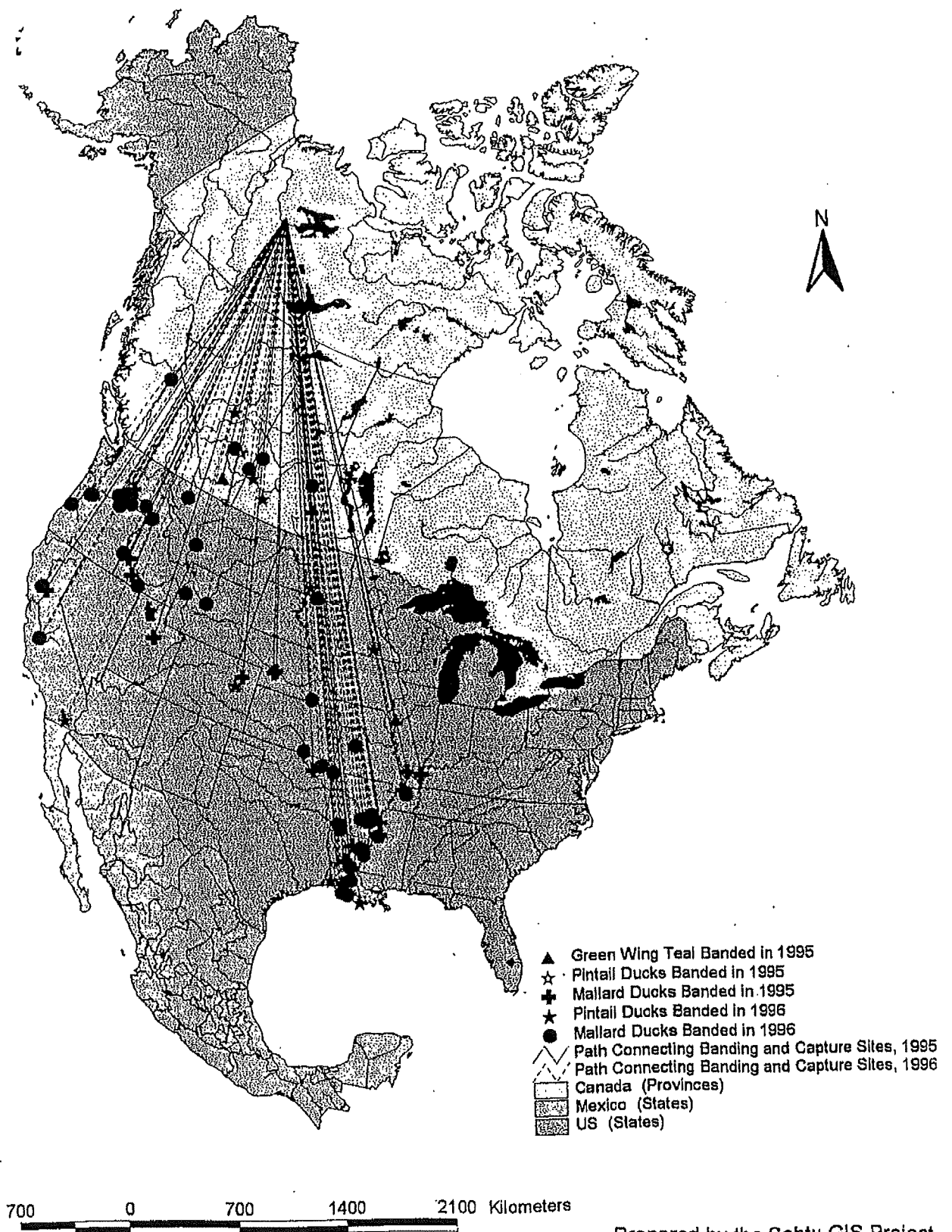
Taken from R. Janes (1983). *Archaeological Ethnography Among Mackenzie Basin Dene, Canada*. The Arctic Institute of North America, Technical Paper No. 28, ISBN 0-919034-57-8.

KEY:

1. Willow Lake banding site - 1996
2. Loche Lake banding site - 1995



Distribution of Band Returns from the 1996 & 1995 Brackett Lake Duck Banding Project



Prepared by the Sahtu GIS Project



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Office of Migratory Bird Management
Population and Habitat Assessment Section
11500 American Holly Drive-Henshaw Bldg.

December 1, 1997

Report
H. Maybe
draft?

Richard Popko
Dept. of Resources, Wildlife and Economic
Development
Norman Wells, N.T.

Dear Richard:

Sorry for not sending you any notes that might have helped put the report together. However, you appear to have covered everything. I have only minor comments on the report, which I have attached. If you have trouble reading anything let me know. I would tend to put the tables after the acknowledgments, but that is personal preference (I forget what other stations' reports appear).

Do you think it would be feasible to increase the number of traps next year to 6 or 8 instead of 4 more? I realize there will be fewer people checking traps but having this many would allow more sites to be explored. Depending on water conditions it seems there may be more room for expansion (beyond what is stated in recommendation #2) next year versus waiting until 1999 - just a thought. I like the way appendices 1-3 look, gives the reader a good feel for chronology of events.

One concern that I forgot to mention to you during our de-briefing in Norman Wells was the evening activities of the volunteers. A few times the volunteers would take Edwards boat down river to the areas where we had traps to ride around. This was more common towards the end of my stay, at a time when we needed to be catching birds. I don't know exactly where they went on these trips, but from the motor noise, it sounded like they would take pretty big loops around the lake. Now, I have absolutely no objection to taking pleasure cruises, especially when 'connie are involved! However, a suggestion to keep disturbance around the traps to a minimum may help trap success. It is hard to say whether this activity hurt trap success this year, but you never know.

Tell Alasdair that winter is nowhere in sight in Maryland. However, training for the Birkebeiner is going well - much ahead of last year. No marathons this fall, but I did run a 26 km race a couple of weeks ago. Roller skis will have to suffice until the white stuff falls. Hope you both have a good holiday season!

Jim

Most of the 1997 duck capture and banding at Willow Lake occurred between August 16-29 (Appendices 1-3). Species composition in the traps noticeably varied by date: northern pintail (August 16 - 27), green-winged teal (Aug 18 - 25), and mallard (August 20 - 29). The daily totals of banded mallards, northern pintails, and green-winged teals, peaked later in the month for each of the three years of the project (1995-1997). Therefore, we suggest that the optimum period for operating this banding station is August 10 to 31.

The Willow Lake banding site has demonstrated it can meet and exceed the banding objectives for mallards and northern pintails as part of the North American Waterfowl Banding Program.

RECOMMENDATIONS:

1. Obtain a proposal from the Tulita Renewable Resources Council to provide duck banding services from August 10 to 31, 1998. A contract between DRWED and TRRC should provide for two banding crews of 2 trained people per crew (80 man-days), return transportation from Tulita to Willow Lake by aircraft or jet boat charter, accommodation facilities and field equipment, food, fuel, and camp supplies.
2. In 1998, construct ~~four~~ ³ new B-2 portable funnel traps and use these to establish ~~a~~ ^{all at least four} new trap sites on the east side of the island at the mouth of the Locho River.
*at least 4 ✓ (is 6-8 possible?)
3. Survey the entire shoreline of Willow Lake to identify further potential banding sites in consideration of an expansion of the project in 1999.
4. Include the following items in the field equipment list: Jon boat with 9 hp *Cou-Devil* rope-start outboard motor (with rock guard and spare propeller), paddles, life jackets, gasoline (4 drums @ 205 L/drum), outboard oil (2 cases @ 12 L/case), and plastic ties (appx. 5000).
5. Obtain a two year supply of grain (i.e., 3172 kg or 7000 lb) by mid-July 1998 so that we ensure sufficient supply is available regardless.
6. Continue to build local support for the program by presentations to community Renewable Resources Councils, the Sahu Renewable Resources Board, and schools.
7. Continue to involve both youth and elders in the project and continue to allow for further training of duck banders.

→ ~~excellent~~ excellent recommendation, perhaps should state possibility of expanding further in 1998 if opportunity presents itself (beyond what is stated³ in recommendation #2)

NARRATIVE:

Boreal wetlands in the Mackenzie Valley, such as the Willow Lake complex, support a dense breeding population of dabbling ducks during years of prairie drought and provide refuge for moulting non-breeding adult ducks. The abundance of migratory waterfowl at the Willow Lake fall and spring staging area has provided sustenance for generations of Willow Lake's Sahtu Dene and Metis.

* The complex of wetlands and ponds surrounding Willow Lake covers 1,343 km² (519 mi²) of post-glacial lake-bottom. Sedge (*Carex spp.*) and horsetails (*Equisetum spp.*) are common shoreline plants. Black spruce (*Picea mariana*) bog, willow (*Salix spp.*) shrubs, and raised peat mounds are common.

Implemented recommendations from the 1996 *Western Canada co-operative banding program at Willow Lake* (Popko et al, 1996) that contributed to the success of this years' project include:

1. The Willow Lake site was evaluated by Jim Kelley (USFWS) as a permanent waterfowl banding station.
2. The Pacific Flyway Council and USFWS provided financial support for the project.
3. DRWED contracted TRRC to deliver banding services at Willow Lake during August 1997.
4. Fourteen B-2 funnel traps were set at the successful 1996 trap site locations on Willow Lake.
5. Baiting practices were changed to 5 kg of barley per trap-night from the 10 kg of barley per trap-night used in 1996. We attempted to be more efficient in placement of traps and the bait within the funnels in 1997 so that almost as many ducks were captured compared to the previous year, but we used 3 less traps and 459 kg less bait.
6. Baited Tomahawk live-traps were set at each banding-site to remove mink. As a result, we experienced no loss of captured ducks to predation in 1997.
7. Locally available aircraft and a jet boat were chartered to transport personnel, field gear, and bait to Willow Lake.
8. Local purchase of camp supplies, food, and fuels, meant increased benefit to local businesses.
9. Four local youth and two elders were trained in duck capture and handling, banding, and data recording.

The USFWS ordered barley from Alberta for three duck banding projects within the Northwest Territories. The grain was trucked from Edmonton to Hay River where it was apportioned to each of these projects. In order to deliver 1590 kg (3500 lb) of barley to Norman Wells for the project to start in early August, *Northern Transportation Company Ltd.* re-routed one of their barges to Norman Wells on August 5.

On July 31, Richard Popko arrived at Willow Lake to open the banding station (Figure 1). Since the bait and supplies must be air freighted to the banding station in a float plane capable of short take-off and landing, we chartered a *Maula Lunar Rocket* airplane from *Ursus Aviation* in Tulita. Fourteen trips were needed to haul everything to Willow Lake in 227kg (500 lb) loads per trip. This was more economical than chartering fewer trips with a larger aircraft and gave us more logistical flexibility.

The initial banding crew from Tulita consisted of Dean Doctor (DD), Kenny Lafleur (KL), Phillip Clement (PC), and Clayton McCauley (CM). On August 5, they departed Tulita for the station in Edward Yakeleya's (EY) boat. Due to low water levels, a jet boat chartered from *Red Dog Mountain Contractors* was required to tow them through Willow Creek to Willow Lake. On August 15, KL returned to Tulita. On August 19, he was replaced by EY when Jim Kelley (USFWS) arrived from Laurel MD via Norman Wells.

Cabins at Willow Lake belonging to the Yakeleya and Doctor families of Tulita, and DRWED provided suitable accomodation.

Local transportation for the banding crews was in a 3.7 m (12 ft) boat with a V-shaped hull and a 9.9 hp motor (owned by DRWED) and a similar boat 5.5 m (18 ft) with a 35 hp motor (owned by EY).

✓ *
Banding trap-sites were selected near channels within the marsh to improve access to areas that had produced ducks in 1996 (Figure 2). The water depth required (ca. 30-35 cm) to operate boats with a V-shaped hull and outboard motors limited daily access to potential trap-sites. Higher than usual water levels persisted throughout most of August, although some trap-sites were still only accessible by wading. A *Jon boat* with a *Go-Devil* motor would ensure continued access to the current trap-sites and allow for trapline expansion around Willow Lake during Re years of lower water levels.

This year's high water levels were a result of above-average rainfall in July (62.1 mm) as compared to an average of 29.3 mm between 1992 and 1996 (Table 1). The 14 mm of rainfall that fell during August was about half the 1992-1996 average (27.2 mm; Table 2). Temperatures during August ranged from a maximum of 29°C during the first week to a minimum of 3.3°C by the third week of August. These temperatures were slightly warmer than average for August (Table 2). We did not receive any frost or snowfall during the period that the banding station operated.

? this seems out of place, move to end, prior to recommendations?

✓ Communications were maintained between the crew and Tulita over a single-side-band HF radio. We also found that mobile telephone service with Northwest Tel. was acceptable when used in conjunction with a 3 m whip antenna.

Trap-site selection and preparation was similar to the 1996 project (Popko et al. 1996). Traps cached in the bush in 1996 were still in good condition. One to three traps were clustered at each of the seven transits (Figure 2). Trap funnels were baited and remained closed until all traps were operational on August 7. Some traps were relocated to deeper water when the water level dropped during the third week of August. Fourteen traps were rebaited as required and checked once daily between August 8 and August 29 for a total of 291 trap-nights.

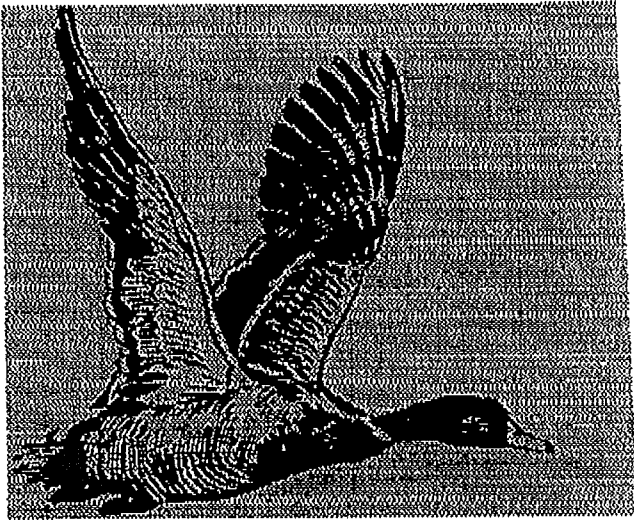
Near the inlet of Willow Lake we successfully captured and banded 1687 ducks from August 08 to 30, 1997 (Table 3). The primary species captured and banded were northern pintail (*Anas acuta*; N=716, 42%), green-winged teal (*A. crecca*; N=487, 29%), and mallard (*A. platyrhynchos*; N=387, 23%). Incidentally captured and banded ducks were American widgeon (*A. americana*; N=92, 6%) and blue-winged teal (*A. discors*; N=5, 0%). No northern shovelers (*A. clypeata*) were caught this year.

Production was good for both northern pintails and green-winged teals, as 75% of the northern pintails and 73% of the green-winged teals were in the hatching-year (HY) age-class (Table 4). The sex ratios of local and HY northern pintails, green-winged teals, mallards, and widgeons were approximately even (Table 3). There were twice as many adult females as adult male northern pintails. Male mallards were three times more plentiful than females.

The average catch-per-unit effort (CUE) for 1997 was 5.8 banded ducks per trap-night. Trapping success increased towards the latter part of August. Between August 14 and 29, the CUE was 7.8 ducks banded per trap-night (Appendices 1-3).

✓ described? Presented
A comparison of 1995, 1996, and 1997 banding totals for this project by species and age-class is prescribed in Table 4. Most of the banded mallards were adults in both 1997 (N=235, 81%) and 1996 (N=1122, 100%). Green-winged teal production was high in 1995 (95% HY) and 1997 (75% HY), and lower in 1996 (27% HY). The number of HY northern pintails has increased each year since 1995 (Table 4). We do not yet have any hypotheses to explain these differences and we anticipate that the long-term nature of this project will provide an opportunity to examine these patterns and perhaps offer explanations for annual variations.

We have banded 4088 ducks from 1995 to 1997 at the two banding stations that have been used in this Stratum 14 project (Table 5). Willow Lake is a reliable banding site and has accounted for 86% of the project's banding totals; 14% of the ducks banded were at Loch Lake in 1995. Three species account for 98% of the project's banding totals: mallards (44%), northern pintails (38%), and green-winged teals (16%). Band recoveries in 1995 and 1996 (N=99; 4.1% of the total banded) were from the Pacific, Central, and Mississippi Flyways (Figure 3).



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DATE: 12/1 NO. PAGES (INCL COVER SHT): 6
TO: Richard Popko
FROM: Jim Kelley
REMARKS/COMMENTS: see attached comments

I have plenty of pictures/slides
from the trip so I don't need
any. If you need any from me
let me know.

Jim

Dedicated to Leadership in Cooperative
Management and Conservation of Migratory
Birds for Future Generations

*WESTERN CANADA CO-OPERATIVE WATERFOWL BANDING PROGRAM AT WILLOW
LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES - AUGUST 1998.*

Richard Popko	Wildlife Technician, Dept. of Resources, Wildlife, and Economic Development (DRWED), Government of the Northwest Territories (GNWT), Norman Wells, NT, Canada.
Alasdair Veitch	Supervisor, Wildlife Management, DRWED, GNWT, Norman Wells, NT, Canada.
John Bidwell	Office of Migratory Bird Management, Waterfowl Population Surveys Section, United States Fish and Wildlife Service (USFWS), Laurel, MD, USA.

ABSTRACT:

In 1998 the Tulita (a.k.a. Fort Norman) Renewable Resources Council (TRRC), the Government of the Northwest Territories Department of Resources, Wildlife and Economic Development (DRWED), and the United States Fish and Wildlife Service (USFWS) successfully collaborated in the fourth consecutive year of duck banding at Willow Lake (65° 14' N; 125° 25' W; a.k.a. Brackett Lake) in the Mackenzie River Valley, Sahtu Settlement Area, N.W.T. The goal to band 800 mallard (*Anas platyrhynchos*), 400 northern pintail (*A. acuta*), and all incidentally-captured ducks, prior to the start of the hunting season was achieved. Duck banding personnel, transportation, and accommodation were provided by a contract between the TRRC and DRWED using funds provided by USFWS. Between August 13 and 30, 1998, a maximum of 16 funnel traps were set for a total of

262 trap-nights. A total of 1700 ducks was banded: 1167 mallards, 311 northern pintails, 210 American wigeons (*A. americana*), 7 green-winged teals (*A. crecca*), and 5 lesser scaups (*Aythya affinis*). The proportion of birds in the after hatch-year (AHY) age-class for all species was 69%. The relative proportion of the 1998 catch of AHY (79% AHY) to hatch-year age-class (HY) mallards was similar to the 1997 catch (81% AHY). The 1998 catch of HY mallard (N = 248, 21 %, HY) and American wigeon (N = 108, 51 %, HY) increased from 1997 mallard (N = 72, 19 %, HY) and American wigeon (N = 76, 83 %, HY). Northern pintail 1998 captures (N = 170, 55 %, HY) decreased from 1997 (N = 535, 75 %, HY). Very few green-winged teal were captured this year (N = 4, 57 %, HY) compared to last year (N = 367, 76 %, HY). Lesser scaup were caught for the first time (N = 5, 100%, HY). Seven mallards and two northern pintails banded at other locations and nine ducks banded locally before 1998 were recaptured and released. Capture-related mortality due to exposure and predation by mink (*Mustela vison*) and black bear (*Ursus americanus*) was 1 % (N = 18). A total of 1812 kg (4000 lb.) of barley was used as bait. Traps were often relocated due to rising water levels during August. The crew improved their duck capture, banding, and handling techniques. The TRRC and DRWED are prepared to continue this project on a long-term basis in conjunction with the USFWS.

NARRATIVE:

Boreal wetlands in the Mackenzie River Valley, such as the Willow Lake complex (Figure 1.), support a dense breeding population of dabbling ducks during years of prairie drought and provide refuge for moulting / non-breeding adult ducks. The abundance of migratory waterfowl at the Willow Lake fall and spring staging area has provided sustenance for generations of Sahtu Dene and Metis people. The complex of wetlands and ponds surrounding Willow Lake covers 1343 km² (519 mi²) of post-glacial lake-bottom. Sedges (*Carex* spp.) and horsetails (*Equisetum* spp.) are common shoreline plants. Black spruce (*Picea mariana*) bog, willow (*Salix* spp.) shrubs, and raised peat mounds are common.

Implemented recommendations from Popko et al. (1997) that contributed to the success of this year's project include:

1. The Willow Lake site is recognized as a long-term waterfowl banding station.
2. USFWS provided financial support and commitment for a flyway biologist to participate in the banding program.
3. DRWED contracted TRRC to deliver banding services with an experienced banding crew, at Willow Lake, during August 1998.
4. The number of B-2 funnel traps was increased from 14 to 16. They were set at the mouth of the Loche River in Willow Lake (Figure 1.).
5. The 9.9 horse-power *Go-Devil* boat motor that Jim Kelly (USFWS, Patuxent, MD.) recommended last year proved to be ideally suited to the weed-choked, shallow water conditions of Willow Lake.
6. Locally available aircraft were chartered to transport personnel, field gear, and bait to Willow Lake and returned to Tulita and Norman Wells.
7. Local purchases of camp supplies, food, and fuels meant increased benefit to local businesses.

The USFWS ordered barley from Alberta for three duck banding projects within the Northwest Territories. The grain was trucked from Edmonton to Hay River where it was apportioned to

each of these projects. *Northern Transportation Company Ltd.* delivered 3624 kg (8000 lb.) of barley to Norman Wells by barge in July. Surplus grain is stored at Willow Lake and Norman Wells (DRWED) for next year.

Personnel, bait, and supplies must be air freighted to the banding station in a float-plane capable of short take-off and landing on the Loche River. There is only one section of this narrow, shallow river that is suitable for landing (estimated length of 500 feet).

On July 16, Richard Popko (RP) inspected the condition of the cabin and storage shed at the Willow Lake banding station and delivered some bait and a boat. John Bidwell (JB) arrived in Norman Wells on August 8. On August 10, RP and JB chartered the *Fairchild Pilatus porter PC6* from *North-Wright Air* in Norman Wells to take the long shafted *Go-Devil* motor and some supplies into the banding station. Stormy weather delayed the arrival of the banding crew from Tulita until August 11: consisting of Edward Yakeleya, Dean Doctor, Clayton McCauley, Daniel Clement and volunteer Denver Clement. They chartered a *Maule Lunar Rocket* airplane from *Ursus Aviation* in Tulita. We started to set and pre-bait traps on August 11 and had sixteen B-2 funnel traps set by August 16. Traps remained set until August 30 for a total of 262 trap-nights.

Cabins at Willow Lake belonging to the Yakeleya and Doctor families of Tulita, and DRWED provided suitable accommodation.

Communications were maintained between the crew and Tulita over a single-side-band HF radio and with Forest Management (DRWED) in Norman Wells.

The banding crew traveled in a 3.7 m (12 ft) boat with a “V”-shaped hull powered by a 9.9 hp motor (owned by DRWED), a similar boat 4.8 m (16 ft) (owned by E. Yakeleya) with a 9.9 hp *Go-Devil* motor (DRWED) and a 12 ft. *Jon* boat. The *Jon* boat was too small and impractical. The *Go-Devil* air-cooled boat motor proved to be the best motor we have used. The crew needs a flat-bottomed boat that is capable of transporting traps that are 8 feet by 4 feet in size with the crew and bait through shallow water and weeds.

Banding trap-sites were selected near channels at the mouth of the Loche River in Willow Lake to ensure access (Figure 1.). The water depth required (ca. 30-35 cm) to operate boats with a “V”-shaped hull and outboard motors limited daily access to potential trap-sites. Normal water level drops were expected; however, this year the water began rising on August 15th and continued until the 27th. Levels rose about 8 to 20 cm (6 to 8 inches) and every trap had to be moved closer to shore at least once. Isolated heavy rains in the northern parts of the watershed caused the problem; however, Willow Lake only had two days of rain.

Trap-site selection and preparation was similar to the 1997 project (cf. Popko et al. 1997). Traps cached in the bush last summer were still in good to fair condition. One to three traps were clustered at each trapping site (Figure 1.). They were checked once daily and re-baited as required. Some old B-2 traps with two (1.2m, 4ft) panels per side were replaced with new B-2 traps made with one panel per side (2.4m, 8ft). These larger collapsible traps do not require staking and they are easier to adjust to changing water conditions.

Near the inlet of Willow Lake we successfully captured and banded 1700 ducks from August 16 to 30 (Table 1.). The primary species captured and banded were mallard (N = 1167, 69 %), northern pintail (N = 311, 18 %), American wigeon (N = 210, 12%). Incidentally captured and banded ducks were green-winged teal (N = 7, 0 %), and Lesser Scaup (N = 5, 0%). Only a few northern shoveler (*Anas clypeata*) or blue-winged teal (*A. discors*) were seen this year and none were captured.

Foreign recaptures that were caught this summer included 7 mallards and 2 northern pintail. Local recaptures from ducks banded at Willow Lake were numerous: 1995 (N = 1), 1996 (N = 2), 1997 (N = 6) and 1998 (N= 655). The number of locally banded recaptured ducks increased daily until August 27. During the last four days there was a daily average of 6 recaptured ducks per trap-night.

The 1998 catch of HY mallards and HY American wigeon was the most we have caught since

the start of this project. Twenty one percent of the mallards and 51% of American wigeon were in the (HY) age-class (Table 1.).

The sex ratio of HY mallard, northern pintail, American wigeon and green-winged teal were about even. As in 1997, male AHY mallards were about three times more plentiful than AHY females (Table 1.).

Trap-related mortality due to mink and black bear predation and exposure was low (N = 18, 1%). Fifty-six percent of the mortality occurred during the last week of the project. The black bear destroyed part of one of the B-2 traps that was within 100 m of camp.

The average catch-per-unit effort (CUE) for 1998 was 6.5 ducks banded per trap-night. This is an increase from an overall CUE of 5.8 in 1997. Trapping success for mallards in 1998 peaked on August 21 and August 25, which is similar to peak catches between August 16, 1995 to August 26, 1997 (Appendix 1.). Trapping success for northern pintail peaked on August 24, 1998 similar to peaks from August 17 to 25 in previous years (Appendix 2.).

We have banded 5788 ducks from 1995 to 1998 at the two banding stations that have been used in this Stratum 14 project (Table 2.). Two species account for 83% of the project's banding totals: mallard (51%) and northern pintail (32%). Most of the 1998 duck capture and banding at Willow Lake occurred between August 17 and 29 (Appendices 1 & 2).

A comparison of 1995 to 1998 banding totals for this project by species and age-class is presented in Table 3. Most of the banded mallards were adults in 1997 (N = 235, 81%), 1996 (N = 1122, 100%) and 1998 (N = 919, 79%). The number of HY northern pintails dropped back to 1996 levels 1995 (Table 3.). Since most of the banded ducks over the past four years are adults; therefore, we do not have to wait for the local ducks to learn to fly before trap setting starts. It would be feasible to start banding at this site during the first week of August. We anticipate that the long-term nature of this project will provide an opportunity to examine patterns and perhaps offer explanations for annual variations in the capture data.

Band recoveries of our 1995 to 1997 ducks (N = 179; 4% of the total banded) were from the Pacific, Central, and Mississippi Flyways (Figure 2.). The species composition of the recoveries is: 125 mallards, 47 northern pintail, 6 green-winged teal, and 1 American wigeon. Eight percent of our 1995 ducks banded at Loche Lake have been returned. All of the 1998 mallards were banded with bands inscribed with a toll-free telephone number for the reporting of band recoveries (1 - 800 - 327 - BAND). This should increase the rate of return for this species. When 1 - 800 bands become available for the other sizes we will switch to them also.

The Willow Lake banding site has demonstrated it can meet and exceed the banding objectives for mallards and northern pintails as part of the North American Waterfowl Banding Program.

RECOMMENDATIONS:

1. The banding crew should begin setting traps and pre-baiting on August 1 so that trapping can start by August 5 and continue until August 30.
2. A contract between DRWED and TRRC should provide for one banding crew of 2 experienced people, an elder for advise, return transportation from Tulita to Willow Lake, and camp accommodation for three people. The two-man crew will check 16 traps daily with a USFWS flyway biologist.
3. Obtain two rolls of 1" by 2" welded wire for trap replacement. This is to be crated and delivered to Norman Wells before 15 July 1999.
4. Survey the entire shoreline of Willow Lake to identify further potential banding sites.
5. Purchase the following items for the banding project: a flat bottomed boat large enough to support 3 people with traps and supplies (18 ft *Go-Devil* boat, gasoline (3 drums @ 205 L/drum), outboard motor oil (2 cases @ 12 L/ case), plastic ties (appx. 5000), food, naptha, chest waders, and camp supplies. 1812 kg (4000 lb) of barley is required for bait each year. This grain must be on a barge departing Hay River NWT by mid July.

6. The banding coordinator should loan these items for the next banding season from DRWED: a portable generator to run a lap top computer so that banding schedules and the banding report can be written in the field, a VCR and television with banding and educational tapes, and a portable shower.
7. Construct one new catch box during the winter of 1998-1999.
8. Continue to build local support for the program by presentations to community RRC's, the Sahtu Renewable Resources Board, and schools.
9. RP and volunteers should experiment with two B-2 traps set in Norman Wells to increase the banding totals and to provide an opportunity for public awareness and involvement in a conservation initiative.

REFERENCES:

- Popko, R., E. Yakeleya, and R. Bromley. 1995. Western Canada co-operative waterfowl banding program at Loche Lake, Mackenzie River Valley, Northwest Territories - August 1995. pp. 6-11 *in* J.F. Voelzer (ed.) Western Canada Cooperative Waterfowl Banding Program - 1995 Banding Report. United States Fish and Wildlife Service, Portland, OR. 142 pp.
- _____, _____, D. Doctor, A. Veitch, and R. Bromley. 1996. Western Canada co-operative waterfowl banding program at Willow Lake, Mackenzie River Valley, Northwest Territories - August 1996. pp. 10-19 *in* J.F. Voelzer (ed.) Western Canada Cooperative Waterfowl Banding Program - 1996 Banding Report. United States Fish and Wildlife Service, Portland, OR. 183 pp.
- _____, A. Veitch, and J. Kelly. 1997. Western Canada co-operative waterfowl banding program at Willow Lake, Mackenzie River Valley, Northwest Territories - August 1997. 19 pp. *in* J.F. Voelzer (ed.) Western Canada Cooperative Waterfowl Banding Program - 1997 Banding Report. United States Fish and Wildlife Service, Portland, OR. 184 pp.

ACKNOWLEDGEMENTS:

The success of this co-management project is a result of the collaboration of many individuals, community organizations, government agencies, and private companies. We are particularly indebted to the Tulita Renewable Resources Council for their continuing support and long-term commitment to this project.

Pilot Perry Linton (*Nahanni Air Services*) and pilot/manager Blair Jensen (*Ursus Aviation*) capably demonstrated their abilities to deliver the grain, equipment, and personnel into the very narrow and short reach of the Loche River at Willow Lake camp.

The arrival of the bait in Norman Wells by mid July was a co-operative effort. John Solberg (USFWS) purchased the grain from Larry Taschuk of Two Hills, Alberta. Kirk Vanderploge with the *Northern Transportation Company Limited* of Hay River arranged delivery service to Norman Wells.

The Doctor and Yakeleya families of Tulita kindly allowed the banding crew to use their cabins at Willow Lake. Louis Marion (DRWED) chinked the walls, replaced the roofing, and painted the old patrol cabin, and made an outhouse at Willow Lake that made accommodations comfortable.

Lana Robinson, GIS Specialist with the Sahtu Geographic Information System Project, produced LANDSAT satellite images of the study area, slides for public presentations, and high quality (and highly sought-after) maps showing the distribution of band returns.

Louise Laurin of the Bird Banding Office (Canadian Wildlife Service) did a constructive review of the banding schedules.

Funding and logistical support were provided by the United States Fish and Wildlife Service, and

the DRWED. Suzanne Carriere (DRWED, Yellowknife), John Solberg (USFWS), and Jim Voelzer (USFWS) assisted with project planning.

Appendix 3: Field crew personnel at the banding station, Willow Lake, Northwest Territories: August 1998.

Tulita Renewable Resources Council

Edward Yakeleya	August	11 - 31
Dean Doctor	August	11 - 31
Clayton M ^c Cauley	August	11 - 31
Daniel Clement	August	11 - 31
Denver Clement (volunteer)	August	11 - 31

United States Fish and Wildlife Service

John Bidwell	August	10 - 31
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Department of Resources, Wildlife, and Economic Development, GNWT

Richard Popko	August	10 – 13 & 28 – 31
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Distribution List

Andre, Leroy. Chairperson, *Renewable Resources Council (RRC)*, Deline, NT
Andrew, Fred. Chairperson, *RRC*, Tulita, NT
Bales, Brad. *Pacific Flyway Study Committee*, *USFWS*, Portland, OR, USA
Bayha, Walter. Renewable Resources Officer (RR0), *DRWED*, Deline, NT
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WESTERN CANADA CO-OPERATIVE WATERFOWL BANDING PROGRAM
AT WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST
TERRITORIES – AUGUST 1999.

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ABSTRACT:

In 1999 the Tulita (a.k.a. Fort Norman) Renewable Resources Council (TRRC), the Government of the Northwest Territories Department of Resources, Wildlife and Economic Development (DRWED), and the United States Fish and Wildlife Service (USFWS) successfully collaborated in the fifth consecutive year of duck banding at Willow Lake (65°14' N; 125°25' W; a.k.a. Brackett Lake) in the Mackenzie River Valley, Sahtu Settlement Area, N.W.T. We achieved our goal to band 800 mallard (*Anas platyrhynchos*) and all incidentally-captured ducks, prior to the start of the hunting season. Duck banding personnel and accommodations were provided by a contract between the TRRC and DRWED using funds provided by USFWS. Between August 1 and 31, 1999, a maximum of 16 funnel traps were set for a total of 439 trap-nights. Bands were placed on 1248 ducks: 1169 mallards, 10 northern pintails (*A. acuta*), 17 American wigeons (*A. americana*), 51 green-winged teals (*A. crecca*) and 1 blue-winged teal (*A. discors*). Total captures were down from 1998 by 452 ducks. The number of mallards captured (N = 1169) was essentially unchanged from 1998 (N = 1167). A reward band study for mid-continent mallards was successfully completed on 900 after-hatch-year (AHY) males. Feather samples were collected from local mallards for a Canadian Wildlife Service study to map feather hydrogen isotope values and latitude. Northern pintail and American wigeon were virtually absent from Willow Lake this year. Ninety-two percent of banded ducks were in the AHY age-class. The relative proportions of the total 1999 catch of mallards that was AHY (N = 1135, 97 %) was higher than the 1998 catch (N = 919, 79 %). Northern pintails AHY captures (N = 4, 40 %) was also higher than the 1998 catch (N = 141, 21 %). The AHY catch of American wigeon (N = 3, 18 %) was low compared to the 1998 catch (N = 102, 49 %). The AHY green-winged teal capture (N = 15, 29 %) was lower than in 1998 (N = 3, 43 %). Twenty-three mallards and 1 green-winged teal banded at other locations or banded locally before 1999 were recaptured and released. Capture-related mortality was 2.2% (N = 28) due to predation by wolves (*Canis lupus*), domestic dog (*Canis domesticus*), marsh hawk (*Circus cyaneus*), and trap-related injuries. A total of 2550 kg (5620 lb) of barley was used as bait. Traps were relocated in response to changes in water levels, captures of northern pike (*Esox lucius*), or muskrats (*Ondatra*

zibethicus). Traps were relocated less often than in 1998. Water levels in Willow Lake were considerably lower than in 1998. Captures of mallards peaked on August 11, dropped off until August 21, and peaked again on August 25. During low water levels (August 11 to 21) mallards were not attracted to barley while feeding on quillwort (*Isoetes muricata* var braunii) in the center of Willow Lake. After several rain showers, water levels rose and average daily temperatures dropped. Then, mallards were attracted to the baited traps. Crew training on duck trapping and banding techniques was continued. The crew was introduced to data entry using the *Davenport Band Scheduler* software. The TRRC and DRWED are committed to continuing this project on a long-term basis in conjunction with the USFWS.

NARRATIVE:

Boreal wetlands in the Mackenzie River Valley, such as the Willow Lake complex (Figure 1), support a dense breeding population of dabbling ducks during years of prairie drought and provide refuge for molting, non-breeding adult ducks. The abundance of migrating waterfowl at the fall and spring staging area at Willow Lake (65°14' N; 125°25' W; a.k.a. Brackett Lake) in the Mackenzie River Valley, Sahtu Settlement Area, N.W.T., has provided sustenance for generations of Sahtu Dene and Metis people. The complex of wetlands and ponds surrounding Willow Lake covers 1343 km² (519 mi²) of post-glacial lake-bottom. Sedges (*Carex* spp.) and horsetails (*Equisetum* spp.) are common shoreline plants. Black spruce (*Picea mariana*), bog willow (*Salix* spp.) shrubs, and raised peat mounds are common.

In 1999, the Tulita (a.k.a. Fort Norman) Renewable Resources Council (TRRC), the Government of the Northwest Territories Department of Resources, Wildlife and Economic Development (DRWED), and the United States Fish and Wildlife Service (USFWS) successfully collaborated in the fifth consecutive year of duck banding at Willow Lake. The goal to band 800 mallard (*Anas platyrhynchos*) and all incidentally-captured ducks, prior to the start of the hunting season was achieved. Duck banding personnel and accommodations were provided by a contract between the TRRC and DRWED using funds provided by USFWS.

Implemented recommendations from Popko et al. (1998) that contributed to the success of this year's project include:

1. The banding crew began setting traps and pre-baiting on August 1. The first ducks were captured on August 5 and mallards started being trapped on August 7. This early start contributed to the successful mallard catch.
2. USFWS provided financial support and commitment for Flyway Biologist John Bidwell (JB) to participate in the banding program.
3. A contract between DRWED and TRRC provided one banding crew of two experienced people, an elder for advice, and camp accommodations.
4. The crew checked 16 traps daily at the mouth of the Loche River in Willow Lake (Figure 1).
5. Two rolls of 2.5 x 5 cm (1 x 2") welded wire for trap replacement were not received in time for trap construction this year. Four new B-2 funnel traps will be made and two catch boxes repaired during the winter of 1999-2000.
6. Water levels were the lowest since 1995. Consequently, a planned survey of the entire shoreline of Willow Lake to locate alternative trap-sites was canceled.
7. A flat-bottomed boat was purchased but it did not arrive for the 1999 season. In 2000 this boat, with the *Go-Devil* motor, will provide an opportunity for new banding site

exploration at Willow Lake or Loche Lake (65° 19' N; 125° 40' W).

8. The 2500 kg (5510 lb) of barley that was requested had shipment delays and only 2500 lb (1132 kg) arrived late on August 11.
9. The Forest Management Division of DRWED provided a portable generator to run a lap-top computer, a VCR/television for educational tapes, and a portable shower for the crew's use.

The USFWS ordered barley from Alberta to be used as trap-bait for three duck banding projects in the N.W.T. Grain was trucked from Edmonton to Hay River where it was apportioned to each project. *Northern Transportation Company Ltd.* delivered 1250 kg (2500 lb) of barley to Norman Wells on August 11. A total of 2550 kg (5620 lb) of barley was used as bait. There is no barley in storage at Norman Wells for next year project.

John Bidwell (JB) arrived in Norman Wells on July 28. He helped Richard Popko (RP) organize equipment and supplies and then flew to Willow Lake on July 31 in an *A Star* helicopter (*Great Slave Helicopters Co. Ltd.*) on contract to Forest Management Division DRWED. The same helicopter transported the crew: Edward Yakeleya, Clayton McCauley, and Phillip Clement to Willow Lake from Tulita. Accompanying the crew for the month were Edward's wife, Therese Clement, and volunteers Paul McCauley, Denver Clement, and Tony Menacho. Cabins at Willow Lake belonging to DRWED, the Yakeleya family, and a DRWED canvas prospector tent provided suitable accommodations. Daily communications were maintained between the crew and DRWED (Norman Wells) over a FM radio on Forest Management's frequencies.

The banding crew traveled in a 3.7 m (12') boat with a "V"-shaped hull powered by a 9.9 hp motor (owned by DRWED), and a similar boat 4.8 m (16') (owned by TRRC) with a 9.9 hp *Go-Devil* motor (DRWED). The *Go-Devil* proved to be the best motor for use in shallow water. With the addition of the 18' flat-bottomed boat purchased in 1999 and the *Go-Devil* motor, new banding sites can be explored next year that will enhance our banding opportunities. Banding trap-sites were selected near channels at the mouth of the Loche River in Willow Lake to ensure access. The 30-35 cm (12-14") water depth required to operate boats with a "V"-shaped hull and outboard motors limited daily access to potential trap-sites. Water levels dropped and reached their lowest level on August 17. Then, rainfall started and water levels returned to their original depth by August 30.

The crew started to set and pre-bait traps on August 1 and sixteen B-2 funnel traps were set by August 3. Traps remained set until August 30 for a total of 439 trap-nights. Trap-site selection and preparation was similar to 1998 (Popko et al. 1998). Traps cached on-site last summer were in fair condition. One or two traps were set at each trapping site. All floaters were replaced by styrofoam insulation panels 0.6 m (2 x 2') with a fiberglass pole anchor. Two panels were placed in the back of each trap. These floaters were cached on-site for next year. Approximately six of the traps need to be replaced in 2000.

Near the inlet of Willow Lake the crew successfully captured and banded 1248 ducks from

August 1 to 30 (Table 1; Figure 3). Total captures were down from 1998 by 452 ducks. The primary species captured and banded was mallard (N = 1169, 94%). The number of mallards captured was essentially unchanged from 1998 (N = 1167). Feather samples were collected from local mallards for a Canadian Wildlife Service study to map feather hydrogen isotope values and latitude. Notably absent were northern pintail (N = 10, 1%) and American wigeon (N = 17, 1%). Other ducks captured were green-winged teal (N = 51, 4%) and blue winged teal (N = 1, 0%). Northern shovelers (*A. clypeata*) were not seen this year. Foreign recaptures caught included 23 mallards and 1 green-winged teal. The number of locally banded recaptured ducks increased daily until August 30, the last day of banding. The highest number of recaptures per day occurred on August 29 with 71 ducks.

During low water levels (August 11 to 21) mallards were not attracted to barley while feeding on quillwort (*Isoetes muricata* var *braunii*) in the center of Willow Lake. After several rain showers, water levels rose and average daily temperatures dropped. Then, mallards were attracted to the baited traps.

Ninety-two percent of banded ducks were in the AHY age-class. The relative proportions of the total 1999 catch of mallards that was AHY (N = 1135, 97%) was higher than the 1998 catch (N = 919, 79%). Northern pintail AHY captures (N = 4, 40%) was also higher than the 1998 catch (N = 141, 21%). The AHY catch of American wigeon (N = 3, 18%) was low compared to the 1998 catch (N = 102, 49%). The AHY green-winged teal captures (N = 15, 29%) was lower than in 1998 (N = 3, 43%).

The 1999 catch was the lowest for hatch-year (HY) and local birds since the beginning of the project in 1995 (Table 3). Only 8% of ducks banded were in the HY and local classes, as compared to 31% in 1998, 63% in 1997, 12% in 1996, and 69% in 1995.

Trap-related mortality (N = 28, 2.2%) was caused by wolves (*Canis lupus*), domestic dog (*Canis domesticus*), marsh hawk (*Circus cyaneus*) and trap injuries. Traps were moved into deeper water or removed to alleviate the problems. There was no predation due to mink (*Mustela vison*) this year, although live traps were set for them at the site below the cabins. Sometimes northern pike (*Esox lucius*) and muskrats (*Ondatra zibethicus*) entered the traps and appeared to deter ducks, but with no associated duck mortality.

We have banded 7036 ducks from 1995 to 1999 at Willow Lake and Loche Lake (Table 2). Two species account for 86% of the project banding totals: mallards (59%) and northern pintail (27%). Band recovery rates from 1995 to 1998 range from 9.8% in 1995 to a low of 4.3% in 1997 (Table 4). Band recoveries were from the Pacific, Central, and Mississippi Flyways (Figure 2). A pilot reward band study for mid-continent mallards was implemented at Willow Lake in 1999. The first 900 AHY male mallards captured were banded with a reward band or a control band. This study will help waterfowl managers determine a preliminary reporting rate so that harvest rates can be better estimated.

Crew training on duck trapping and banding techniques was continued. They were introduced to data entry using the *Davenport Band Scheduler* software. The TRRC and DRWED are committed to

continuing this project on a long-term basis in conjunction with the USFWS.

The Willow Lake site has demonstrated it can meet and exceed the banding objectives for mallards and northern pintails as part of the North American Waterfowl Banding Program.

RECOMMENDATIONS:

1. Start the project on August 1 each year to catch post-breeding mallards and continue trapping until August 31.
2. Purchase 3000 kg (6612 lb) of barley prior to the 2000 banding project. Ensure that the bait arrives in Norman Wells before July by delivering it on the winter road during January or February. Continue to deliver 3000 kg (6612 lb) of barley each year. This strategy allows for a small stockpile of grain to be kept at Norman Wells and ensures that the project can proceed on August 1.
3. Build four new B-2 funnel traps using the 1.2 m (4') panel design with wire mesh tops. These traps have proven to be the easiest to set and relocate in the muddy conditions at Willow Lake.
4. Repair two catch boxes prior to August 2000.
5. A USFWS Flyway Biologist should go to Willow Lake each year for the duration of the project.
6. Deliver the new 18' flat-bottomed boat purchased in 1999, for use with the *Go-Devil* motor, to Willow Lake prior to August 2000.
7. Purchase spare parts for the *Go-Devil* motor.
8. A 31-day contract between DRWED and TRRC should provide for one banding crew from Tulita made up of 2 experienced banders and an elder for advice, with their food and accommodation at Willow Lake, and return transportation from Tulita to Willow Lake.
10. Continue to have a portable generator for computer data entry at Willow Lake.
11. Initiate data entry into *Master Bander* software at the banding station so that completed banding schedules are compatible with banding office requirements at CWS and USFWS.
12. Co-operate with a proposed land skills education program for Tulita youth at Willow Lake during August 2000.
13. Continue to build local support for the project by presentations to the Sahtu Renewable Resources Board and local RRC's. Inform people throughout the Sahtu on the purpose of duck banding and on the results from the project.

**WESTERN CANADA CO-OPERATIVE WATERFOWL BANDING PROGRAM AT
WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES –
AUGUST 2000**

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Alasdair Veitch	Supervisor Wildlife Management, DRWED, GNWT, Norman Wells, NT, Canada

ABSTRACT:

In 2000, the Tulita (a.k.a. Fort Norman) Renewable Resources Council (TRRC), the Government of the Northwest Territories Department of Resources, Wildlife and Economic Development (DRWED), and the United States Fish and Wildlife Service (USFWS) successfully collaborated in the sixth consecutive year of duck banding at Willow Lake (65°14' N; 125°25' W; a.k.a. Brackett Lake) in the Mackenzie River Valley, Sahtu Settlement Area, N.W.T. We again achieved our goal to band at least 1000 mallards (*Anas platyrhynchos*) and all incidentally-captured ducks prior to the start of the hunting season. Duck banding personnel and accommodations were provided by a contract between the TRRC and DRWED using funds provided by USFWS. Up to 18 funnel traps were set for a total of 490 trap-nights during 3-30 August. A total of 2025 kg (4463 lb.) of barley was used as bait. Standard leg bands were placed on 1600 ducks: 1503 mallards (93.9%), 1 mallard-black duck hybrid (*A. platyrhynchos* x *A. rubripes*), 75 northern pintails (*A. acuta*; 4.7%), 11 American wigeons (*A. americana*), 3 green-winged teals (*A. crecca*), 4 blue-winged teals (*A. discors*), 1 redhead (*Aythya americana*), 1 greater scaup (*A. marilla*), and 1 lesser scaup (*A. affinis*). Ninety-nine percent of banded ducks were in the after hatch-year age-class, which means productivity or brood survival, or both, was the lowest recorded in the six years of this project. The total capture was up by 352 from 1999 primarily as a result of an increase in numbers of mallards captured. Captures of mallards peaked from 12 to 18 August 2000. Northern pintail and American wigeon were seldom seen or captured at the banding site, similar to 1998 and 1999. Duck species captured for the first time at the Willow Lake site were: redhead, lesser scaup, and a mallard-black duck hybrid. Capture-related mortality was 1.3% (N = 21), primarily due to predation (62%) by wolves (*Canis lupus*) and mink (*Mustela vison*), and from trap-related injuries (38%). Feather samples were collected from 4 local mallards for a Canadian Wildlife Service study to map feather hydrogen isotope values and latitude. Stable and high water levels in Willow Lake meant traps had to be relocated less often than in 1999; water levels were the highest observed since the start of the project in 1995. Crew training on banding techniques was continued. For the first time during this project, banding data records and schedules were created using *Master Bander* software. The TRRC and DRWED are committed to this project on a long-term basis in conjunction with the USFWS.

NARRATIVE:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area (SSA) of the Northwest Territories (NWT), support dense summer populations of molting, non-breeding adult ducks. Therefore, the United States Fish and Wildlife Service (USFWS) collaborated again in 2000 with the Tulita RRC (TRRC) and the Department of Resources, Wildlife & Economic Development (DRWED) in the sixth consecutive year of duck banding within the Sahtu – the 283,000 km² region of the central Northwest Territories covered by the Sahtu Dene and Metis Comprehensive Land Claim Agreement (DIAND 1993). In 1995, the project was established at Loche Lake northeast of Tulita (Popko et al. 1995); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 it was moved to the nearby larger Willow (a.k.a. Brackett) Lake (65°14' N; 125°25' W) where it has remained ever since (Popko et al. 1997, 1998; Bidwell et al. 1999). The annual goal of the project is to band at least 1000 mallards (*Anas platyrhynchos*) and all incidentally-captured ducks prior to 01 September, the start of the fall hunting season in the NWT.

The USFWS ordered barley from Alberta to be used as trap-bait for the three ongoing duck banding projects in the NWT. Grain was trucked from Edmonton to Hay River where it was apportioned to each project. *Northwest Transport* delivered 4530 kg (10,000 lb.) of barley to Norman Wells in February 2000 during the mid-January to mid-March winter road season. Barley not required during 2000 for the project is stored at Norman Wells and Willow Lake for next year's project.

A crew to assist bander and senior author John Bidwell (JB) was again arranged by DRWED via a contract with the TRRC using funds provided by the USFWS. JB arrived in Norman Wells on 27 July to pick up and organize equipment and supplies arranged by Richard Popko (RP). JB flew to Willow Lake on 29 July on *North-Wright Airways Ltd.*'s Dehavilland D-6 *Twin Otter* aircraft on floats. On 31 July, *North-Wright's* Plateau *Porter* on floats transported banding crew Edward Yakeleya, Clayton McCauley, and Phillip Clement from Tulita to Willow Lake. Grain, food, equipment, and gas were delivered to Willow Lake with RP on 4 August, and also on 7, 13, and 20 August by separate aircraft charters. Also accompanying the banding crew for the month were Edward's wife, Therese Clement, and student volunteers: Paul McCauley, William Andrew, Kayla Lennie, Matilda Lennie, and Denver Clement. Cabins at Willow Lake belonging to DRWED and the Yakeleya family were used for accommodations. Communications were maintained between the banding crew and DRWED in Norman Wells by a satellite telephone and with Tulita's RRC by single-side-band HF radio.

Within the study area, the banding crew traveled in a 5.5 m (18 ft.) flat-bottomed boat with a 9.9 hp *Go-Devil* outboard motor and a 3.7 m (12 ft.) boat with a "V"-shaped hull powered by either a 4-stroke 9.9 hp or 2-bladed 9.9 hp motor. The *Go-Devil* has consistently proven to be the best motor for use in shallow, weedy water. Repairs to motors were extensive in 2000 as a result of a lack of basic preventative field maintenance and by contaminated gasoline.

Trap-site selection was again based upon our previous trapping success at Willow Lake (1996-1999) and near channels at the mouth of the Loche River to ensure there was sufficient water to permit ready access to the traps. Unlike our experience in 1999 (Bidwell et al. 1999), water levels during the entire trapping season were the highest observed since the project began in 1995. Water depth did not limit access to most of the trap-sites resulting in fewer trap relocations than in 1999. Water levels were highest 9-17 August and coincided with the peak of mallard captures (12-18 August).

Trap-site selection and preparation was similar to last year (Bidwell et al. 1999). Traps cached on-site last summer were in fair condition. Traps were set and pre-baited starting on 01 August. Eighteen B-2 funnel traps were set near the inlet of Willow Lake by 03 August. One or two traps were set at each trapping site. The most productive traps in decreasing order were traps numbered 7, 8, 9, 10, 11, 12, 17, and 18 in Figure 1. Traps remained set until 30 August for a total of 490 trap-nights. Two 0.6 x 0.6 m (2 x 2 ft.) styrofoam insulation panels were anchored with fiberglass poles inside each trap to provide resting platforms. Three traps damaged by rusting and predators in 1999 were replaced. Therefore, we recommend that all traps should be replaced every five years. Those traps with tops currently made of plastic netting should be replaced with wire mesh, since traps with wire mesh tops are easier to assemble, transport, and relocate than those with netting.

Ducks were live-captured and banded at Willow Lake from 03 to 30 August (Table 1) using a total of 2025 kg (4463 lb.) of barley for bait. Our total capture was up by 352 ducks from 1999 (Bidwell et al. 1999). Mallards – our primary objective - comprised 94% (N = 1503) of all birds banded, an increase from the 1135 banded in 1999. Other species banded were 75 northern pintails, 11 American wigeon, 4 blue-winged teal, 3 green-winged teal, and 1 each of lesser scaup, greater scaup, redhead, and a mallard-black duck hybrid. These were the first captures of redhead, lesser scaup, and mallard-black duck hybrid at Willow Lake. The mallard-black duck capture is outside of its established range (Godfrey 1986). As in 1998 and 1999, northern pintails and American wigeon were not abundant at Willow Lake this year; whereas in 1996 and 1997 we banded 733 and 716 northern pintails, respectively. In previous years wigeon have been relatively abundant at Willow Lake although they were rarely live-trapped and banded during those years.

Of 756 recaptures, 38 were banded at other banding stations and another 38 had been banded at either Loche or Willow Lake from 1995 to 1999. Since most (90%) recaptures were same-year ducks from our Willow Lake traps, it is not surprising that the highest single-day total of recaptured ducks was 66 on 29 August (Table 2).

A measure of annual duckling production, brood survival, or both within the Sahtu is provided by the proportion of birds banded at Willow Lake that is in the hatch-year (HY) and local bird age classes. Disturbingly, only 1% of ducks banded at Willow Lake in 2000 was in these age classes (Table 3). Hatch-year and local birds have comprised 1 to 69% of birds banded from 1995 to 2000. The results from 2000 at Willow Lake strongly suggest that juvenile production, survival, or both were extremely low this year. Similar low brood counts for mallards and

pintails were obtained during a survey of the Willow Lake area during 8-10 July 2000 (Bruce MacDonald, *Ducks Unlimited Canada* (DU), Yellowknife, NT, personal communication). This survey was done as part of DU's *Boreal Waterfowl Initiative* to identify and document waterfowl habitat and populations in Canada's boreal forests.

Trap-related deaths of 21 ducks (1.3% of all ducks captured) were caused by wolf (*Canis lupus*) predation (14 %), mink (*Mustela vison*) predation (48 %), and trap-related injuries (38 %). This is below our average annual trap-related mortality rate for this project (1995-2000) of 2.4% (range 0.1- 4.7%). Mink predation was encountered at traps numbered 1, 4, 5, 17, and 18 and wolf predation at trap 15 (Figure 1). To reduce predator-related mortalities we moved traps into deeper water or removed them and to reduce trap-related injuries (primarily resulting from over-crowding), we began checking the best-producing traps twice daily after mid-August. A few northern pike (*Esox lucius*) and muskrats (*Ondatra zibethicus*) occasionally entered the traps, which appeared to deter ducks from entering. A nuisance black bear (*Ursus americanus*) was deterred from camp; however, after the crew departed the banding station on 31 August it caused extensive damage to 2 of 3 cabins used by the banding crew and 3 adjacent cabins. The bear was eventually shot and killed in defence of life and property.

Feather samples (4) were collected from pre-fledged local mallards for a Canadian Wildlife Service (CWS) study started in 1999 to map feather hydrogen isotope values and latitude. Past research has indicated that brood production is lower during drought years and that ducks migrate to wetter northerly locations. This feather isotope study may provide a tool for waterfowl biologist to assess productivity by duck species that breed in the north (Craig Hebert, Research Scientist, CWS, Hull, PQ personal communication).

Traps were removed from the water on 30 August. The banding crew was flown from Willow Lake to Tulita and Norman Wells on 31 August in NorthWright's *Courier* aircraft on floats. On 15 September, a final aircraft charter was arranged to return equipment requiring maintenance or secure storage to DRWED in Norman Wells.

A total of 8636 ducks from 10 different species have been live-captured and banded at Loche and Willow Lakes from 1995 to 2000 (Table 4). Mallards and northern pintails have accounted for 65 % and 23 %, respectively, of all birds banded. Returns of bands within 1 year of banding has averaged 6.5% for the Willow Lake banding project (Table 5); for 5 years post-banding it has averaged 11.2%. The overall band return rate for the project is 8.6%. Our first-year recovery rate is below the 8.8% reported by Henny and Burnham (1976) for mallards banded in the NWT from 1972 to 1974. However, our five-year recovery rate is similar to the 11.3% return rate for mallards banded in Ontario from 1976 to 1997 (McIlveen et al. 1999). To date, bands from ducks banded at Willow Lake have been recovered from each of the Pacific, Central, Atlantic, and Mississippi Flyways (Figure 2). Band recovery locations indicate that there are two main wintering areas for ducks that breed in the Sahtu: the lower Mississippi River in the southern USA and the Pacific northwestern states of Washington, Idaho, and Oregon. Distant recoveries have occurred in Alaska, Mexico, Florida, and Ontario.

Crew training on banding techniques is an ongoing process and was continued by JB in 2000. This was the first year that data was entered using *Band Manager* software developed by the United States Geological Service (Biological Resources Division), CWS, and *Bird Studies Canada*. Banding schedules were completed in the field, checked at RWED Norman Wells, and promptly sent to the Bird Banding Office, CWS, in Ottawa, ON.

The Willow Lake duck-banding site has demonstrated it can meet and exceed the banding objectives for mallards, and occasionally for northern pintails, as part of the *North American Waterfowl Banding Program*. The project continues to be a model of cooperation between the United States federal government (USFWS), the Canadian federal government (CWS), the Government of the Northwest Territories (DRWED), and a local community organization (TRRC). The TRRC is given responsibility for involvement in and approval of, wildlife research and management projects in their area by the terms of the *Sahtu Dene and Metis comprehensive land claim agreement* (DIAND 1993). The TRRC and DRWED are committed to continuing this project on a long-term basis in conjunction with the USFWS.

Implemented recommendations from Bidwell et al. (1999) that contributed to the success of this year's project were:

1. The banding crew completed trap setting and initial baiting by 3 August. The first ducks were captured on 3 August and mallards started being trapped on 9 August. This early start contributed to the successful mallard catch.
2. USFWS provided financial support and commitment for a Flyway Biologist (JB) to participate in the banding program.
3. A contract between DRWED and TRRC provided one banding crew of three experienced people, and camp accommodations.
4. The crew checked 18 traps daily at the mouth of the Loche River in Willow Lake.
5. Two rolls of 2.5 x 5 cm (1 x 2 in.) welded wire were used to make 3 new B-2 funnel traps and repair two catch boxes to replace 5-yr-old traps damaged by rust or wolves.
6. A flat-bottomed boat (purchased in 1999) with a *Go-Devil* motor is an excellent means for transporting crew and traps across weedy, shallow water.
7. Two years supply of barley, 4530 kg (10,000 lb.), arrived at Norman Wells by winter road. This enabled use of aircraft 'back-haul' charters to move some grain to the banding station prior to the banding season.
8. The Forest Management Division of DRWED provided a portable generator to run a lap-top computer, and a portable shower for the crew's use.

RECOMMENDATIONS:

1. Annually, purchase 2265 kg (5000 lb.) of barley and arrange delivery on the winter road in January or February for the next banding season. This strategy allows for a small stockpile of grain to be kept at the banding station, which ensures that the project can proceed on schedule.
2. Annually build three new B-2 funnel traps using the 1.2m (4ft.) panel design with wire

mesh tops to replace 5-yr-old traps. Cut the trap door 8cm from the edge to allow the trap to sink in the mud. Replace all plastic trap netting with wire mesh. This trap design has proven to be the easiest to set and relocate with the sometimes fluctuating water levels and generally muddy substrate conditions experienced at Willow Lake.

3. To conform to requirements stipulated in our CWS-issued *Banding Permit* (#10707 held by RP) - banding sites should be clearly identified with proper on-site signage.
4. Obtain a new portable catch box - used for removing captured ducks from the traps. We suggest obtaining one recently designed by USFWS Flyway Biologist Carl Ferguson.
5. To maximize the number of post-breeding mallards captured, we recommend that trapping be done from the first week of August until 30 August.
6. Styrofoam trap floats are falling apart from use and exposure to the elements. These floats need to be replaced in 2001.
7. A USFWS Flyway Biologist should continue to work with the TRRC crew at Willow Lake annually to maintain data quality.
8. Upgrade the current 9.9 hp *Go-Devil* outboard motor to a 16 hp *Go-Devil* (including sufficient spare parts for field maintenance and repair) in 2002.
9. Ensure that all outboard motors, boats, and the generator are given regular inspections and necessary maintenance, and are equipped with sufficient basic spare parts to be maintained and repaired in the field.
10. A 31-day contract between DRWED and TRRC should provide for one banding crew from Tulita made up of two dedicated, mature individuals, with accommodation at Willow Lake.
11. Banding data should continue to be entered into *Master Bander* software at the Willow Lake banding station so that completed banding schedules are promptly available to CWS Banding Office and are compatible with CWS and USFWS requirements. The computer will require continued use of a portable generator and one should be bought for the project in 2001.
12. Renovate the DRWED storage shed at Willow Lake with shelving for storage of banding equipment and supplies.
13. Collaboration should continue with other projects, such as DU's *Boreal Waterfowl Initiative* and the CWS study of feather isotopes.
14. Record daily water levels at a permanent site near the traps to allow quantitative assessment and comparison.
15. Continue to build local support for the project by producing posters giving results of the project and by giving presentations to the SRRB and the five RRC's in Tulita, Norman Wells, Deline, Colville Lake, and Fort Good Hope. Inform people throughout the region on the purpose of duck banding, results from the project, and reporting of band recoveries.

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PERSONAL COMMUNICATIONS:

Bruce MacDonald, NWT Manager, *Ducks Unlimited Canada*, Yellowknife, NWT.

Craig Hebert, Research Scientist, Wildlife Toxicology Section, National Wildlife Research Centre, *Canadian Wildlife Service*, Hull, PQ.

ACKNOWLEDGEMENTS:

The success of this co-management project is a result of the collaboration of many individuals, community organizations, government agencies, and private companies. We are particularly indebted to the Tulita Renewable Resources Council for their continuing support and long-term commitment to this project:

John Solberg and Karen Tiedt (USFWS) purchased the grain from Larry Taschuk of Two Hills, Alberta and arranged for on time delivery by truck on the winter road to Norman Wells.

Pilot/owner Warren Wright and pilot Perry Linton (*North-Wright Airways Ltd.*) again capably demonstrated their abilities to deliver the grain, equipment, and personnel to the Willow Lake camp.

The Yakeleya family of Tulita kindly allowed the banding crew to use their cabins at Willow Lake.

Celina Stroeder, Sahtu Region Superintendent (DRWED) in Norman Wells authorized use of departmental resources and staff-time. The following DRWED employees assisted with the project: Sam Kivi (Manager, Corporate Services) provided administrative and financial accountability, Louis Marion (Renewable Resources Officer, Tulita) authorized use of the Willow Lake patrol cabin, Tim Melnyk (Warehouse Store-person) loaned equipment, and Martin Rojek (Assistant Warehouse Store-person) made two new B-2 traps and repaired the catch boxes.

Miki Promislow, GIS Specialist with the *Sahtu Geographic Information System*, produced the figures in the report and posters that will be distributed to RRC's and the SRRB.

The banding assistance provided by Philip Clement, Clayton McCauley, and volunteers Denver Clement and Paul Menacho is appreciated.

Louise Laurin of the Bird Banding Office (CWS) and Mrs. Isner of the Bird Banding Laboratory (USFWS) did a constructive review of the banding schedules.

Funding and logistical support were provided by the USFWS and the DRWED. John Solberg (USFWS) and Jim Voelzer (USFWS) assisted with project planning.

**UNITED STATES/CANADA CO-OPERATIVE WATERFOWL BANDING REPORT,
WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES –
AUGUST 2001**

John Bidwell	Flyway Biologist, Office of Migratory Bird Management, Waterfowl Population Surveys, United States Fish and Wildlife Service, Old Town, ME, USA.
Richard Popko	Wildlife Technician, Dept. of Resources, Wildlife & Economic Development (DRWED), Government of the Northwest Territories (GNWT), Norman Wells, NT, Canada.
Alasdair Veitch	Supervisor Wildlife Management, DRWED, GNWT, Norman Wells, NT, Canada

ABSTRACT:

In 2001, the Tulita (a.k.a. Fort Norman) Renewable Resources Council (TRRC), the Government of the Northwest Territories Department of Resources, Wildlife and Economic Development (DRWED), and the United States Fish and Wildlife Service (USFWS) collaborated in the seventh consecutive year of duck banding at Willow Lake (65°14' N; 125°25' W; a.k.a. Brackett Lake) in the Mackenzie River Valley, Sahtu Settlement Area, N.W.T. Our goal is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally-captured ducks (1000 per species) prior to the start of the hunting season every year. Duck banding personnel and accommodations were provided by a contract between the TRRC and DRWED using funds provided by USFWS. Up to 18 funnel traps were set for a total of 451 trap-nights during 4-30 August. A total of 1788 kg (3940 lb) of barley was used as bait. Standard leg bands were placed on 404 ducks: 361 mallards (89.4%), 22 American green-winged teals (*A. crecca*), 11 northern pintails, and 10 American wigeons (*A. americana*). This was our lowest catch total in seven consecutive years. Low numbers of puddle ducks were present. Twelve percent of banded ducks were in the hatch-year age-class, which suggests productivity or brood survival rates, or both was higher than in the previous three years. The total capture was down by 1196 from last year, primarily as a result of low numbers of puddle ducks in the area. Captures of mallards peaked on 13 August 2001 with 71 ducks. Northern pintail and American wigeon were seldom seen or captured at the banding site, similar to 1998 to 2000. Capture-related mortality was 12% (N = 50) due to predation: 70% by mink (*Mustela vison*) and 30% by wolf (*Canis lupus*). Seven feather samples were collected from 2 local broods of mallards for a *Canadian Wildlife Service* study to map feather hydrogen isotope values and latitude. High water levels in Willow Lake dropped a total of 28cm (11in) during August. Traps were relocated to avoid predators and adjusted to adequate water levels. Banding data records were created using *Master Bander* software at the banding station. The TRRC and DRWED are committed to this project on a long-term basis in conjunction with the USFWS.

NARRATIVE:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area (SSA) of the Northwest Territories (NWT), sometimes supports dense summer populations of molting, non-breeding adult ducks, some years there is high productivity, and in other years there are fewer ducks. The United States Fish and Wildlife Service (USFWS) collaborated again in 2001 with the Tulita RRC (TRRC) and the Department of Resources, Wildlife & Economic Development (DRWED) in the seventh consecutive year of duck banding within the Sahtu – the 283,000 km² region of the central Northwest Territories covered by the *Sahtu Dene and Metis Comprehensive Land Claim Agreement* (DIAND 1993). In 1995, the project was established at Loche Lake northeast of Tulita (Popko et al. 1995); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 it was moved to the nearby larger Willow (a.k.a. Brackett) Lake (65°14' N; 125°25' W) where it has remained ever since (Popko et al. 1997, 1998; Bidwell et al. 1999, 2000). The annual goal of the project is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally-captured ducks (1000 per species) prior to 01 September, the start of the fall hunting season in the NWT.

The USFWS ordered barley from Alberta to be used as trap-bait for the four ongoing duck banding projects in the NWT. Grain was trucked from Edmonton to Hay River where it was apportioned to each project. *Northwest Transport* delivered 2500 kg (5510 lb.) of barley to Norman Wells in January 2001 during the mid-January to mid-March winter road season. Barley not required during 2001 for the project is stored at Norman Wells and Willow Lake for next year's project.

Grain was delivered by snowmachine to the banding site during March 2001. A crew to assist bander and senior author John Bidwell (JB) was again arranged by DRWED via a contract with TRRC using funds provided by the USFWS through the *Wildlife Management Institute*. JB arrived in Norman Wells on 30 July to check equipment and supplies arranged by Richard Popko (RP). JB flew to Willow Lake on 01 August in *North-Wright's Plateau Porter* on floats and transported banding crew Edward Yakeleya and Phillip Clement from Tulita to Willow Lake. Food, equipment, and 2 drums of gas were delivered to Willow Lake on 01 August and on 18 August by aircraft charters. Cabins at Willow Lake belonging to DRWED and the Yakeleya family were used for accommodations. Communications were maintained between the banding crew and DRWED in Norman Wells and with Tulita's RRC by single-side-band HF radio, Forestry radio, and by satellite telephone. The latter was particularly invaluable when used to request an aircraft to take a crewmember for medical attention. A *Sahtu Helicopters* helicopter on contract with Forest Management, RWED provided a medivac for JB to Norman Wells to remove a piece of trap wire from his eye.

Within the study area, the banding crew traveled in a 5.5m (18 ft) flat-bottomed boat with a 9.9 hp *Go-Devil* outboard motor. The *Go-Devil* is the best motor for use at this shallow, weedy, lake. A 9.9 hp outboard motor was borrowed as a back-up motor on site. Preventative maintenance minimized equipment repair.

Trap-site selection was again based upon our previous trapping success at Willow Lake (1996-2000) and near channels at the mouth of the Loche River to ensure there was sufficient water to permit ready access to the traps. Similar to 2000 (Bidwell et al. 2000), water levels allowed access to the inlet of Willow Lake. Water levels were highest on 03 August, dropped 18cm (7 ¼ in) by 17 August, and fell 30cm (11 ¾ in) by 30 August. Decreasing water depth limited access to some trap-sites resulting in trap relocations after 12 August. Weather was generally fair (sunny or scattered cloud) on 14 days, overcast on 13 days, and it rained on six days. A strong cold front during 15 to 17 August preceded a peak of mallard captures on 19 August. Average daily 1300h temperature was 20°C (68°F), the maximum temperature occurred August 15 at 30°C (86°F), and the lowest temperature was 10 °C (50°F) on 17 August.

Trap-site selection and preparation was similar to last year (Bidwell et al. 2000). Traps cached on-site last summer were in fair condition. Nine traps were set and heavily pre-baited on each of 02 and 04 August. The Willow Lake trapline of B-2 funnel traps included seven traps set east of Loche River and eleven to the west of Loche River by 04 August. One to four traps were set at each trapping site. The most productive trap sites were near the mouth of Loche River in decreasing order traps numbered 11, 10, 9, 8, and 7, 6, 5 in Figure 1. Traps remained set until 30 August for a total of 451 trap-nights. Two 0.6 x 0.6 m (2 x 2 ft.) high density styrofoam insulation panels were anchored with fiberglass poles inside each trap to provide resting platforms. Three traps damaged by rusting and predators in 2000 were replaced. All of our B-2 traps were converted to wire mesh tops, since traps with wire mesh tops are easier to assemble, transport, relocate, and maintain than traps with tops made of netting.

Ducks were live-captured and banded at Willow Lake from 8 to 30 August (Table 1) using a total of 1788 kg (3940 lb) of barley for bait. Our total capture was down by 1196 ducks from 2000 (Bidwell et al. 2000). Mallards – our primary objective - comprised 89% (N = 361) of all birds banded, a decrease from the 1503 banded in 2000. Other species banded were 22 American green-winged teal (*A. crecca*), 11 northern pintails, and 10 American wigeon (*A. americana*). As in 1998 to 2000 northern pintails were not abundant at Willow Lake this year, whereas in 1996 and 1997 we banded 733 and 716 northern pintails, respectively. As in previous years (1996-1999), American wigeon were relatively abundant at Willow Lake although they were rarely live-trapped and banded.

Of 135 recaptures this year, 13 were banded at other banding stations and another 16 had been banded at either Loche or Willow Lake from 1995 to 2000. Since most (79%) recaptures were same-year ducks from our Willow Lake traps and the highest single-day total of recaptured ducks was early in the season (13 August), this indicated that few local ducks and no significant influx of migrating puddle ducks was present (Table 2).

The USFWS spring 2001 breeding population aerial survey reported low numbers of puddle ducks along the Mackenzie River in Sahtu and Inuvik regions. Crewmember Edward Yakeleya noticed spring migration of mallards at his home beside Willow Lake. He suggested that as cold temperatures and snow persisted throughout May, that mallards returned south, some returned to nest later, or re-nest after a nest failure. Other indications of late spring nesting was the greater

than normal capture of young broods (Class 1 chicks, Aug 9), and the greater numbers of adult females without broods. Aerial surveys of study areas near Norman Wells on 9 - 14 July and 5 - 9 August 2001 found low abundance of mallards, and increased brood counts compared to 2000 survey data of mallard, American wigeon, and American green-winged teal (Bruce MacDonald, *Ducks Unlimited Canada* (DU), Yellowknife, NT, personal communication). Twelve percent of ducks banded at Willow Lake in 2001 were in the local and hatch-year age classes (Table 3). Hatch-year and local birds have comprised up to 69% of birds banded here in a season (1995). The results from 2001 at Willow Lake suggest that juvenile production, survival, or both increased this year at low numbers.

Mallards and American wigeon were feeding extensively on an abundant supply of *Quillwort* spp. in Willow Lake. They appeared to prefer it to barley.

Trap-related deaths of 50 ducks (12% of all ducks captured) were caused by five mink (*Mustela vison*) predation (70 %) and one wolf (*Canis lupus*) predation (30%). This is above our average annual trap-related mortality rate for this project (1995-2001) of 2.6% (N=34). Predation was encountered at the most productive trap sites including traps numbered 8, 9, 10, 11, and 12 (Figure 1). To reduce predator-related mortalities, predators were live-trapped and removed from trap sites. A cinnamon colored black bear (*Ursus americanus*) was deterred from camp.

Feather samples (7) were collected from pre-fledged local mallards for a *Canadian Wildlife Service* (CWS) study started in 1999 to map feather hydrogen isotope values and latitude (Craig Hebert, Research Scientist, CWS, Hull, PQ).

Most puddle ducks had started migrating south from Willow Lake by 29 August. Waterfowl observed but not trapped include: American wigeon and pacific loons (*Gavia pacifica*) were abundant, lesser scaup (*Aythya affinis*) were common, few blue-winged teal (*A. discors*), cinnamon teal (*A. cyanoptera*), bufflehead (*Bucephala albeola*), and Canada geese (*Branta canadensis*), and no northern shovelers (*A. clypeata*), tundra swans (*Cygnus columbianus*), snow geese (*Anser caerulescens*) or white-fronted geese (*Anser albifrons*) that are usually seen in abundance. Traps were removed from the water on 30 August. The banding crew was flown from Willow Lake to Tulita and Norman Wells on 31 August in NorthWright's *Plateus Porter* aircraft and to return equipment-requiring maintenance or secure storage to DRWED, Norman Wells. Traps, grain, boats, *Go-Devil* motor, carousel, and some banding supplies are stored at Willow Lake.

A total of 9040 ducks from 10 different species have been live-captured and banded at Loche and Willow Lakes from 1995 to 2001 (Table 4). The species composition, age and sex classes, and abundance of puddle ducks banded at Willow Lake have varied from year to year. Mallards and northern pintails have accounted for 66% and 22%, respectively, of all birds banded. Returns of bands for 2 years post-banding has averaged 11.7% for the Willow Lake banding project (Table 5). Ducks banded at Willow Lake were recovered from 37 states (85%) and 6 Canadian provinces in each of the Pacific, Central, Atlantic, and Mississippi Flyways (Figure 2).

This was the second year that data was entered using *Band Manager* software. Banding schedules were completed in the field and promptly received in good order at the *Bird Banding Office*, CWS, in Ottawa, ON in early September.

The Willow Lake duck-banding site has demonstrated it can meet the banding objectives for mallards, and occasionally for northern pintails, as part of *United States/Canada Waterfowl Banding Program*. The project continues to be a model of cooperation between the United States federal government (USFWS), the Canadian federal government (CWS), the Government of the Northwest Territories (DRWED), and a local community organization (TRRC). The TRRC is given responsibility for involvement in and approval of wildlife research and management projects in their area by the terms of the *Sahtu Dene and Metis comprehensive land claim agreement* (DIAND 1993). The TRRC and DRWED are committed to continuing this project on a long-term basis in conjunction with the USFWS.

Implemented recommendations from Bidwell et al. (2000) that contributed to the success of this year's project were:

1. Delivered 2265 kg (5000lb) of barley on the winter road to Norman Wells, Jan 2001.
2. Built three new B-2 funnel traps using the 1.2m (4ft.) panel design with wire mesh tops to replace 5-yr-old traps. Replaced all plastic trap netting with wire mesh.
3. Traps were closed between 04 August until 30 August.
4. Replaced some styrofoam trap floats.
5. A USFWS Flyway Biologist worked with the TRRC crew to ensure data quality.
6. All equipment was inspected and maintained.
7. A 31-day contract between DRWED and TRRC provided for one banding crew from Tulita made up of two individuals, with accommodation at Willow Lake.
8. Banding data was entered into *Master Bander* software at the Willow Lake banding station and banding schedules promptly sent to CWS Banding Office.
9. DRWED's storage shed at Willow Lake was re-organized for storage of banding equipment and supplies.
10. Collaboration continued with other projects: DU's *Boreal Waterfowl Initiative* and the CWS study of feather isotopes.
11. Daily water levels and weather conditions were recorded in Willow Lake.
12. Informed people throughout the Sahtu region on the purpose of duck banding, results from the project, and reporting of band recoveries by distributing reports, giving presentations, and a newspaper article.

RECOMMENDATIONS:

1. Purchase a 9.9 hp outboard motor with a two-bladed propellor, as a spare boat motor. This is essential as other outboard motors are not available.
2. Build three new B-2 funnel traps using the 1.2m (4ft.) panel design with wire mesh tops and criss-crossed hog rings, to replace 5-yr-old traps and have a total of 20 working traps.

3. Obtain an electric grinder and safety goggles for trap wire cutting at Willow Lake.
4. To conform to requirements stipulated in our CWS-issued *Banding Permit* (#10707 held by RP) - banding sites should be clearly identified with proper on-site signage.
5. Obtain a new portable catch box designed by USFWS Flyway Biologist Carl Ferguson.
6. Some styrofoam trap floats are falling apart from use and exposure to the elements. Some of these floats need to be replaced in 2002.
7. Set snap-traps at the bait storage shed and forward captured small mammal specimens to the *University of Alaska, Fairbanks' - Beringean Co-evolution Project*.
8. Set live-traps for mink near each B-2 trap-site to prevent predation of captured ducks.
9. Place a blind near the most productive trap-site to record observations of mallard behaviour entering the trap funnel and feeding at the trap-site.
10. Experiment with the use of trap leads to funnel the approach of ducks to a trap.
11. Experimentally make and set a floating trap.
12. Offer to collaborate with DU's study on scaup brood survival (co-ordinator: Stu Slattery) and share resources (cabin use).
13. Schedule a ten-year replacement (2007) for the 9.9hp *Go-Devil* outboard motor with a 16 hp *Go-Devil* (including sufficient spare parts for field maintenance and repair).
14. Purchase and deliver 2265 kg (5000 lb) of barley on the winter road to Norman Wells, Jan 2002.

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PERSONAL COMMUNICATIONS:

Bruce MacDonald, NWT Manager, *Ducks Unlimited Canada*, Yellowknife, NWT.

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Pilot Perry Linton (*North-Wright Airways Ltd.*) again capably demonstrated his ability to deliver the grain, equipment, and personnel to the Willow Lake camp.

Celina Stroeder, Sahtu Region Superintendent (DRWED) in Norman Wells authorized use of departmental resources and staff-time. The following DRWED employees assisted with the project: Sam Kivi (Manager, Corporate Services) provided administrative and financial accountability, Louis Marion (Renewable Resources Officer, Tulita) and Arianna Zimmer (Cumulative Effects Biologist) assisted hauling grain by snowmachine to Willow Lake, Tim Melnyk (Warehouse Store-person) loaned equipment.

The banding assistance and local traditional environmental knowledge for the seventh consecutive year by Edward Yakeleya is irreplaceable.

Philip Clement mastered the art of operating the *Go-Devil* and provided continuous banding assistance.

Tyler Harris assisted with trap construction and trap setting with ingenuity.

Miki Promislow, GIS Specialist with the *Sahtu Geographic Information System*, produced the figures in the report and posters that will be distributed to RRC's and the SRRB.

Louise Laurin of the Bird Banding Office (CWS) and Mrs. Isner of the Bird Banding Laboratory (USFWS) did a constructive review of the banding schedules.

Funding and logistical support were provided by the USFWS and the DRWED. John Solberg (USFWS) and Jim Voelzer (USFWS) assisted with project planning.

**UNITED STATES/CANADA CO-OPERATIVE WATERFOWL BANDING REPORT,
WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES –
AUGUST 2002**

Richard Popko	Wildlife Technician, Dept. of Resources, Wildlife, & Economic Development (DRWED), Government of the Northwest Territories (GNWT), Norman Wells, NT, Canada.
John Bidwell	Flyway Biologist, Office of Migratory Bird Management, Waterfowl Population Surveys, United States Fish and Wildlife Service, Old Town, ME, USA
Alasdair Veitch	Supervisor Wildlife Management, DRWED, GNWT, Norman Wells, NT, Canada

ABSTRACT:

In 2002, the Tulita Renewable Resources Council (TRRC), the Government of the Northwest Territories Department of Resources, Wildlife and Economic Development (DRWED), and the United States Fish and Wildlife Service (USFWS) collaborated in the eighth consecutive year of duck banding at Willow Lake (65°14' N; 125°25' W; a.k.a. Brackett Lake) in the Mackenzie River Valley, Sahtu Settlement Area, N.W.T. Our goal is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally-captured ducks (1000 per species) prior to the start of the hunting season every year. A waterfowl biologist (USFWS) supervised banding assistants (3 persons) on contract between the TRRC and DRWED and one summer student. Funding was provided by USFWS. Eighteen funnel traps were set for a total of 416 trap-nights during 5-29 August. A total of 2763 kg (6100 lb) of barley was used as bait. Standard leg bands were placed on 2168 ducks: 889 northern pintails (41%), 588 mallards (27%), 314 American green-winged teals (*A. crecca*), 279 American wigeons (*A. americana*), 82 blue-winged teals (*A. discors*), 9 northern shovelers (*A. clypeata*), 4 gadwalls (*A. strepera*), 2 lesser scaups (*Aythya affinis*), and 1 hybrid mallard / northern pintail. The total capture represents a record for the station and was about five times greater than last year, probably a result of high numbers of puddle ducks flying over drought areas in the prairies and arriving in boreal wetlands during late spring. Captures of mallards peaked on 17 August 2002 with 183 ducks banded. Thirty-seven percent of banded ducks were in the hatch-year age-class, which suggests productivity was higher than the previous 5 years. Capture-related mortality was 1% (N = 22) due to predation: 18% by mink (*Mustela vison*), 14% by lynx (*Lynx lynx*), and exposure (68%). Twelve feather samples were collected from broods of mallards and northern pintails for a *Canadian Wildlife Service* study to map feather hydrogen isotope values and latitude. Higher than normal water levels in Willow Lake prevailed during August. Traps seldom required relocating to adjust for dropping water levels or predation. Banding data records were created using *Master Bander* software at the banding station. The TRRC and DRWED are committed to this project on a long-term basis in conjunction with the USFWS.

NARRATIVE:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area (SSA) of the Northwest Territories (NWT), sometimes supports dense summer populations of molting, non-breeding adult ducks, some years there is high productivity, and in other years there are fewer ducks. The United States Fish and Wildlife Service (USFWS) collaborated again in 2003 with the Tulita Renewable Resources Council (TRRC) and the Department of Resources, Wildlife, & Economic Development (DRWED) in the ninth consecutive year of duck banding within the SSA. In 1995, the project was established at Loche Lake northeast of Tulita (Popko et al. 1995); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 it was moved to the nearby larger Willow (a.k.a. Brackett) Lake (65°14' N; 125°25' W) where it has remained ever since (Popko et al. 1997, 1998; Bidwell et al. 1999, 2000, 2001, 2002). Trap site locations were moved from the inlet of Willow Lake to the better sandy substrate area found near the outlet of Willow Lake in 2002 and 2003. A tent frame base camp was constructed on the Brackett River. The annual goal of the project is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally-captured ducks (1000 per species) prior to 01 September, the start of the sport hunting season in the NWT.

The USFWS ordered barley from Alberta to be used as trap-bait for the four ongoing duck banding projects in the NWT. Grain was trucked from Edmonton to Hay River where it was apportioned to each project. *Northwest Transport* delivered 2265 kg (5000 lb) of barley to Norman Wells in January 2003 during the mid-January to mid-March winter road season. Trucking is only possible at this time of year as the most economical and efficient method of transporting grain to the SSA.

A two-person crew to assist bander, John Bidwell (JB) was arranged by DRWED via a contract with TRRC using funds provided by the USFWS through the *Wildlife Management Institute*. Two student (*Sahtu Renewable Resources Board*) recieved training as assistant duck banders for 2 weeks each.

Permission to enter onto private lands and to construct a duck banding base camp was obtained from the Tulita Lands Corporation (TLC) with the support of the Tulita Renewable Resources Council.

During March the *Go-Devil* motor was hauled out of Willow Lake by snowmachine and delivered to Norman Wells by Ron Doctor (Renewable Resources Officer trainee) where it was overhauled at *Derwyn's Small Engine Repairs*.

A metal grain storage silo, acquired from Forest Management, RWED, was successfully slung from Stewart Lake fire camp to Brackett River by *Canadian Helicopter's* Bell 212 helicopter.

Camp site selection and helipad clearing was initiated on 12 June by Norman Wells fire crew members and rp.

Tulita's forest fire crew did a superb job of constructing a camp and helipad including two tent frames complete with bunks, tables and chairs, an outhouse, and a log helicopter landing pad.

Barley 1825kg (4022b) was hauled by *Great Slave Helicopter's* A-Star helicopters on contract with Forest Management (DRWED) during early July and the entire bait cache stored in 2002 at Willow Lake was relocated to Brackett River.

JB arrived in Norman Wells on 30 July to finalize equipment checking and supplies arranged by Richard Popko (RP). JB flew to Willow Lake on 01 August in *North-Wright Airways Ltd.'s Plateus Porter* airplane on floats and transported banding crew Albert Bernarde, Peter Horassi and William Andrew with personal effects from Tulita to Willow Lake.

August 14 Jb was flown to Norman Wells Health Centre for medical attention. August 15 *Ursus Aviation Ltd.'s Maule Rocket* airplane on floats delivered Denver Clement and jb with fresh food and supplies to Willow Lake and returned to Tulita with William Andrew on a scheduled crew change.

During late August, a community meeting was held at Willow Lake outpost camp to initiate self government process for Tulita. This provided opportunity for Wilfred Lennie (President, TRRC) and Gordon Yakeleya (President, TLC) to visit the banding crew at the banding site.

Communications were maintained between the banding crew and DRWED in Norman Wells and with Tulita's RRC by single-side-band HF radio, Forestry radio, and by satellite telephone. The latter was particularly invaluable 14 August to request a helicopter to take a crew-member JB to Norman Wells for medical attention. *Ursus Aviation Ltd.'s Maule Rocket* airplane on floats was chartered to take JB and Denver Clement, with fresh food and supplies to Willow Lake and return to Tulita with William Andrew on a scheduled crew change.

Within the study area, the banding crew traveled in a 5.5m (18 ft.) flat-bottomed boat with a 9.9 hp *Go-Devil* motor and a 4.3m (14 ft.) *Lund* with a 9.9 hp outboard motor.

Trap-site locations, based upon our previous trapping success at Willow Lake (1996-2002), were near channels that ensured sufficient water depth to permit access to the traps.

Traps had to be relocated to accommodate the continuously dropping water levels throughout August.

Trap-site substrate was sand with detritus and a little muck that provided an excellent trap base. Weather was generally cloudy, cold, and wet with rain, fog and snow showers. A windy, cold front on August preceded a peak of mallard captures.

Traps cached on-site last summer were in good condition.

No new traps were made this year.

The Willow Lake trapline of B-2 funnel traps included ten traps at 4 sites east of Brackett River and eight traps at 2 sites to the west of Brackett River set-up by 04 August. Traps were prebaited then closed on August 6.

Two to six traps were set at each trap-site. Willow Point, the most productive trap-site, was a narrow point sheltered by offshore horsetail (*Equisetum spp.*) mats. Traps were operational and catching ducks earlier than in previous years.

Traps remained set until 30 August for a total of 423 trap-nights (TN) similar to 416TN in 2002. Trap set up was the same as in 2002.

Two 0.6 x 0.6 m (2 x 2 ft.) high-density styrofoam insulation panels were anchored with fiberglass poles inside each trap to provide resting platforms. All of our B- 2 traps have wire mesh tops and no floor. Traps are not attached to poles thus allowing them to sink into the substrate. This modification reduces washing away of substrate under the trap walls and reduces the number of ducks that escape by diving under the trap wall.

Ducks were live-captured and banded at Willow Lake from 6 to 30 August (Table 1) using a total of 2300 kg (5061 lb) of barley for bait. A total capture of 1348 banded ducks is similar to our nine year banding average of 1395.

northern pintails were banded (N = 296), a decrease from our previous banding record of 733 in 1996.

Mallards – our primary objective - comprised 25% (N = 298) of all birds banded, a lot less than our maximum catch of 1503 mallards in 2000.

American wigeon (*A. americana*) were relatively abundant at Willow Lake and we banded 312 of these birds.

435 green-winged teal (*A. crecca*),

6 blue-winged teal (*A. discors*),

the only other species captured was our first American Black Duck (*A. rubripes*)

The number of recaptures dropped from 135 in 2001 to 20 recaptured mallards and northern pintails. Only 2 ducks caught at Willow Lake in 2002 had been banded at other banding stations, while 18 recaptured ducks had been banded at either Loche or Willow Lake from 1995 to 2001. Most (99 %) of 1925 recaptures were banded locally this year, with the highest single-day totals during 13-25 August (Table 2).

The USFWS “Waterfowl Breeding Population and Habitat Condition Aerial Surveys in Alberta, British Columbia, and NWT” (Ferguson and Straughn 2002), reported a late-spring over-flight of puddle ducks from the extremely dry prairie areas of Western Canada into good habitat conditions found in NWT’s boreal wetlands that increased our dabbling duck populations by 8% above the ten-year mean. Subsistence hunters at Willow Lake and all Sahtu communities along the Mackenzie River Valley reported very low numbers of waterfowl during their traditional spring hunt, during April to early June. Sub-freezing temperatures were still occurring in Norman Wells during the third week of June. Other indications of late spring nesting was the

greater than normal capture of young broods of a variety of dabblers ("Class 1" chicks, Aug 9).

Thirty-seven percent of ducks banded at Willow Lake in 2002 were in the local and hatch-year age-classes (Table 3). The results from 2002 at Willow Lake suggest that juvenile production probably increased this year as a result of an influx of late-arriving dabblers from the prairie drought areas.

Trap-related deaths of ducks (less than 1% of all ducks captured) were caused by exposure. This is our lowest annual trap-related mortality rate for this project (1995-2002) of xx%. To reduce predator-related mortalities trap were relocated further off shore and shoreline cover. Two black bears (*Ursus americanus*) and one timber wolf (*Canus lupus*) were deterred from camp by a solar powered portable electric fence.

Most puddle ducks had started migrating south from Willow Lake by 29 August. Canada geese (*Branta canadensis*), tundra swans (*Cygnus columbianus*), snow geese (*Anser caerulescens*) and greater white-fronted geese (*Anser albifrons*) that are usually seen in abundance in late August were not common. Traps were removed from the water on 30 August. The banding crew was flown from Willow Lake to Tulita and Norman Wells on 31 August in *North Wright Airways Ltd.'s Plateus Porter* airplane and returned equipment-requiring maintenance or secure storage at DRWED, Norman Wells. Traps, grain, boats, *Go-Devil* motor, carousel, and some banding supplies are stored at the Willow Lake DRWED silo.

A total of 12,557 ducks from 13 different species have been live-captured and banded at Loche and Willow Lakes from 1995 to 2003 (Table 4). The species composition, age and sex classes, and abundance of puddle ducks banded at Willow Lake have varied from year to year. Mallards and northern pintails have accounted for 55% and 25%, respectively, of all birds banded. Our band return rate has averaged 12% for the Willow Lake banding project (Table 5). Ducks banded at Willow Lake were recovered from xx states x(%), x Canadian provinces, and Mexico, in each of the Pacific, Central, Atlantic, and Mississippi Flyways (Figure 1)

This was the fourth year that data was entered in the field on a lap top computer using *Band Manager* software. Banding schedules were also completed in the field and promptly received in good order at the *Bird Banding Office*, CWS, Ottawa, at the start of the duck-hunting season.

The Willow Lake duck-banding site has demonstrated it can meet the banding objectives for mallards, and occasionally for northern pintails, as part of the *United States / Canada Waterfowl Banding Program*. The project continues to be a model of cooperation between the United States federal government, the Canadian federal government, the Government of the Northwest Territories, and local community organizations. The TRRC is given responsibility for involvement in, and approval of, wildlife research and management projects in their district under the terms of the *Sahtu Dene and Metis Comprehensive Land Claim Agreement* (DIAND 1993). *Tulita Lands Corporation* is responsible for approving terms of access on selected lands in Tulita District, including the Willow Lake watershed. The TRRC and DRWED are committed to continuing this project on a long-term basis in conjunction with the USFWS.

Implemented recommendations from Popko et al. (2002) that contributed to the success of this year's project were:

1. Delivered 2265 kg (5000lb) of barley on the winter road to Norman Wells, Jan 2003.
2. Replaced the catch box with one designed and forwarded by USFWS Flyway Biologist Carl Ferguson
3. A USFWS Flyway Biologist worked with the TRRC crew to ensure data quality.
3. All equipment was inspected and maintained.
4. A 31-day contract between DRWED and TRRC provided for one 2-person banding crew from Tulita.
5. Obtained approval from the *Tulita Lands Corporation* to enter private lands and constructed a new semi-permanent duck banding base camp consisting of 2 tent frames,, a storage silo, and a helicopter pad located on Brackett Creek about 400m downstream Willow Lake.
6. Set traps in the same general area as 2002, near the outlet of Willow Lake, and increased the number of traps at Willow Point from 6 to 8 traps. No traps were replaced.
7. Banding data was entered into *Master Bander* software at the Willow Lake banding station and banding schedules promptly sent to CWS Banding Office.
8. We informed people throughout the Sahtu region on the purpose of duck banding, results from the project, and reporting of band recoveries this was done by distributing reports, doing community presentations in Tulita and Norman Wells, and at Sahtu Renewable Resources Board meeting.

RECOMMENDATIONS:

1. Purchase and deliver 2265 kg (5000 lb) of barley on the winter road to Norman Wells, Jan 2004.
2. Essential to have one biologist, preferably a USFWS Waterfowl Biologist, assisted by 2 representatives from the *Tulita Renewable Resources Council*. The TRRC banding assistants should preferably have local environmental knowledge of the Willow Lake area. Also, hire a summer student (SRRB).
3. Make a wire mesh triangle corner for each of the eighteen B-2 funnel traps exits.
4. Schedule annual trap replacement for two new B-2 traps starting 2004.
5. Maintain an annual end-of-season inventory of all project equipment and supplies.
6. Schedule a ten-year replacement (2007) for the 9.9hp *Go-Devil* outboard motor with a 16 hp *Go-Devil* (including sufficient spare parts for field maintenance and repair).

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ACKNOWLEDGEMENTS:

We are particularly indebted to the Board of Directors and Wilfred Lennie (President) of the *Tulita Renewable Resources Council* for their continuing long-term commitment to this project, and banding assistance provided by their contract crew members: Albert Bernarde and Peter Horassi.

Jody Snortland (Executive Director) of the *Sahtu Renewable Resources Board* provided the opportunity for Denver Clement and William Andrew as summer student assistants.

Pilot owner Blair Jensen (*Ursus Aviation Ltd.*) and pilot owner Warren Wright (*North-Wright Air Ways Ltd.*) capably demonstrated their ability to deliver grain, equipment, and personnel to the Willow Lake camp.

Karen Tiedt (USFWS, Portland, OR.) arranged for the purchase of barley from Larry Taschuk of Two Hills, Alberta and delivery by truck on the winter road to Norman Wells.

Celina Stroeder, Sahtu Region Superintendent (DRWED) in Norman Wells authorized use of departmental resources and staff-time. The following DRWED employees assisted with the project: Sam Kivi (Manager, Corporate Services) provided administrative and financial accountability, Tim Melnyk (Warehouse Store-person) loaned equipment, James Auld (GIS Specialist) produced the figures in the report, Paul Rivard (Forestry Manager) arranged flying time from the contract helicopter (*Great Slave Helicopters*) to sling field equipment including silo.

Louise Laurin of the Bird Banding Office (CWS) did a constructive review of the banding schedules.

Carl Ferguson (Flyway Biologist, USFWS) designed and provided an excellent "duck friendly" and efficient catch box.

Funding and logistical support were provided by the USFWS and the DRWED. Jim Voelzer (USFWS) assisted with project planning.

**UNITED STATES/CANADA CO-OPERATIVE WATERFOWL BANDING REPORT,
WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES,
AUGUST 2003**

Richard Popko	Wildlife Technician, Dept. of Resources, Wildlife, & Economic Development (RWED), Government of the Northwest Territories (GNWT), Norman Wells, NT, Canada.
John Bidwell	Flyway Biologist, Office of Migratory Bird Management, Waterfowl Population Surveys, United States Fish and Wildlife Service, Old Town, ME, USA.
Alasdair Veitch	Supervisor Wildlife Management, RWED, GNWT, Norman Wells, NT, Canada.

ABSTRACT:

In 2003, the Tulita Renewable Resources Council (TRRC), the Government of the Northwest Territories' Department of Resources, Wildlife and Economic Development (RWED), and the United States Fish and Wildlife Service (USFWS) collaborated in the ninth consecutive year (1995-2003) of duck banding at Willow Lake (65°14' N; 125°25' W) in the Mackenzie River Valley, Sahtu Settlement Area, NWT. Our annual goal for this site is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (1000 per species) prior to the start of the fall hunting season. Funding for the project was provided by the USFWS, the Sahtu Renewable Resources Board (SRRB), and RWED. A waterfowl biologist (USFWS) supervised two contract-banding assistants (contract between RWED and TRRC) for 31 days and two summer students hired by the SRRB for two weeks each. A maximum of 18 funnel traps were set for a total of 423 trap-nights during 6 to 30 August. A total of 2300 kg (5061 lb) of barley was used as bait. Standard leg bands were placed on 1348 ducks: 435 American green-winged teals (*A. crecca*; 34% of all ducks banded), 312 American wigeons (*A. americana*; 23%), 298 mallards (22%), 296 northern pintails (22%), 6 blue-winged teals (*A. discors*), and one American black duck (*A. rubripes*). The total number of ducks banded is similar to the nine-year average for this banding station (N=1395). Captures of ducks peaked on 23 August with 132 ducks banded (9.8% of the 2003 total). Sixty-three percent (N = 846) of banded ducks were in the hatch-year or local age-class, which represents the best year of production since the project's start in 1995. Twelve of 14 recaptured ducks were banded locally in 2002 and two were banded at the station in 1999. No ducks banded at other locations were captured. Despite periodic rain showers, water levels dropped significantly throughout August and were considerably lower than last year. We feel that having traps located at greater distances from shoreline cover than in 2002 likely contributed to our lowest recorded mortality of trapped ducks due to predation. Capture-related mortality due to exposure was very low at 0.4% (N = 6). A new catch box design reduced the incidence and severity of wing and bill injuries of captured ducks.

NARRATIVE:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area (SSA) of the Northwest Territories (NWT), sometimes support dense summer populations of molting, non-breeding adult ducks - in some years there is high productivity whereas in others there are fewer ducks. The United States Fish and Wildlife Service (USFWS) collaborated again in 2003 with the Tulita Renewable Resources Council (TRRC) and the Department of Resources, Wildlife, & Economic Development (RWED) in the ninth consecutive year of duck banding within the Sahtu.

In June 2003, biologists with the USFWS rated waterfowl habitat in the Sahtu to be “good with below average winter precipitation, spring weather about a week late, and an overall increase in the estimated waterfowl numbers.” (Ferguson and Straughn 2003). Subsistence hunters at Willow Lake and in other Sahtu communities along the Mackenzie River Valley reported an increase in the numbers of waterfowl during their traditional spring hunt in 2003 compared to what was considered a poor year in 2002.

In 1995, the project was established at Loche Lake northeast of Tulita (Popko et al. 1995); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 the banding station was moved to the nearby and larger Willow Lake (65°14' N; 125°25' W) where it has since remained (Popko et al. 1997, 1998; Bidwell et al. 1999 to 2002). Trap site locations were moved from the inlet of Willow Lake (north end) to the better sandy substrate area found near the outlet of Willow Lake (south end) in 2002 and 2003. A tent frame base camp was constructed on the Brackett River and was fully operational in 2003. The annual goal of the project is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally-captured ducks (1000 per species) prior to 01 September, opening day of the duck hunting season in the NWT.

Permission to enter onto the private lands of the Sahtu Dene and Métis, and to construct a base camp for the use of this project, was obtained prior to the start of the 2003 season from the Tulita Lands Corporation (TLC) with the support of the TRRC.

The USFWS ordered barley from Alberta to be used as trap-bait for the four ongoing duck banding projects in the NWT. Grain was trucked from Edmonton to Hay River where it was apportioned to each project. Northwest Transport Ltd., Edmonton, delivered 2265 kg (5000 lb) of barley to Norman Wells in January 2003 during the mid-January to mid-March winter road season. Trucking is only possible at this time of year and is the most economical and efficient method of transporting grain to the Sahtu for this project.

During March, the *Go-Devil*™ 9.9 hp motor used for the project was removed from Willow Lake by Ron Doctor (Renewable Resources Officer/Parks Trainee, RWED) and delivered to Norman Wells by snow machine where it was overhauled at Derwyn's Small Engine Repairs. Within the study area, the banding crew traveled in a 5.5 m (18 ft.) flat-bottomed boat with the

9.9 hp *Go-Devil*TM motor. The operation of this shallow draft boat and motor is essential for efficient daily trap checking in the shallow weed choked waters at Willow Lake. A 4.3m (14 ft.) *Lund*TM with a 9.9 hp outboard motor was at camp as a back-up means of transportation.

A two-person crew (Albert Bernarde and Peter Horassi) was hired by the TRRC to assist USFWS waterfowl biologist John Bidwell (JB). The TRRC annually has a contract for this project arranged by RWED using funds provided by the USFWS via the Wildlife Management Institute (Washington, DC). In addition, the Sahtu Renewable Resources Board hired two summer students (William Andrew and Denver Clement) as project assistants for 2 weeks each.

An RWED contract forest fire suppression crew from Norman Wells and RP began campsite selection and brush clearing for a helicopter-landing site on 12 June. The RWED contract fire crew from Tulita constructed two tent frames and cleared another helicopter landing pad. A metal grain storage silo, acquired from Forest Management, RWED, was successfully slung from Stewart Lake fire camp to Brackett River by a Bell 212 helicopter (Canadian Helicopters Ltd., Norman Wells). The silo provides secure storage for grain, food, and supplies. Throughout the summer the banding crew constructed an outhouse, bunks, tables, and chairs; they also painted the outside of the buildings. Two black bears (*Ursus americanus*) and one timber wolf (*Canus lupus*) were effectively deterred from camp by a solar-powered electric fence that surrounds the campsite.

An Aerospatiale 350 'A-Star' helicopter (Great Slave Helicopters, Norman Wells) on contract with RWED Forest Management was used to haul 1825 kg of barley from Norman Wells to the banding station in early July. The remainder of our barley stored at a patrol cabin owned and maintained by RWED at Willow Lake was also used.

JB arrived in Norman Wells on 30 July to finalize checking equipment and supplies arranged by RP. There are no roads in the vicinity of Willow Lake; therefore, logistic support for this project requires chartered aircraft including the transport of personnel, equipment, tools, fuel, food, and banding supplies to and from the banding site. On 01 August JB flew from Norman Wells to Willow Lake in a Plateaus 'Porter' float-equipped aircraft (North-Wright Airways Ltd., Norman Wells) with equipment and supplies. Then the airplane continued to Tulita to transport banding crew Albert Bernarde, Peter Horassi, and William Andrew with personal effects to the banding station.

Communications were maintained between the banding crew and RWED in Norman Wells and Tulita's RRC office by single-side-band HF radio, Forestry radio, or by satellite telephone. The latter was particularly invaluable 14 August to request a helicopter to take crewmember JB to Norman Wells for medical attention. A Maule 'Rocket' airplane on floats (Ursus Aviation Ltd., Tulita) was chartered to take JB and Denver Clement, fresh food, and supplies to Willow Lake and return to Tulita with William Andrew on a scheduled crew change on 16 August.

During late August, a meeting was held at Willow Lake outpost camp to initiate Tulita's self-government negotiations. This provided the opportunity for Wilfred Lennie (President, TRRC)

and Gordon Yakeleya (President, Tulita Lands Corporation) to observe duck banding procedures and inspect the campsite.

Most of the traps cached on-site last summer were in good condition; therefore, no new traps were made this year. Trap wire arrived in Norman Wells by Mackenzie River barge in September 2003 to make two replacement traps for the project in 2004. The B-2 funnel trap set up was similar to previous years. Trap-site locations were based upon previous trapping success (Popko et al. 2002). Trap-site substrate was sand with detritus and a little muck that provided an excellent trap base. The Willow Lake trap line included nine traps at 2 sites west of Brackett River and nine traps at 2 sites to the east of Brackett River set-up and pre-baited on 04-05 August. Between four to nine traps were set at each trap-site. Traps were set on 06 August. Traps had to be relocated several times to accommodate the continuously dropping water levels. Traps remained set until 30 August for a total of 423 trap-nights (TN), which is similar to 416 TN in 2002. Willow Point was the most productive trap-site. Overall trapping success was 3.2 ducks per trap night. Ducks were live-captured and banded at Willow Lake from 07 to 30 August using 92 bags of barley for bait, a total of 2300 kg (5061 lb).

A new catch box designed and constructed by Flyway Biologist Carl Ferguson (USFWS) arrived in time for use during this banding season. The catch box's "duck friendly" construction reduced injuries to both bills and wings during removal of ducks from the traps. We found it to be very effective for the conditions at Willow Lake and recommend its use at other banding stations?

The first duck was caught on 07 August, but cold weather and strong north/west winds resulted in no further captures until 10 August (Table 1). The most productive capture period was the third week of August when daily captures peaked on 23 August (132 ducks banded). This year's total capture of 1348 ducks banded is similar to our nine-year average of 1395 ducks banded. American green-winged teal (*A. crecca*) was the most abundant banded duck species this year (Table 1). A record number of 312 American wigeon (*A. americana*) was banded. Mallards comprised 25% (N = 298) of all birds banded; however, this represents our lowest number of mallards banded since 1995. The catch of 296 northern pintails was below our annual average for this species. The number of blue-winged teal (*A. discors*) captured (N = 6) was average. We also banded one American black duck (*A. rubripes*), which is an unusual species in the NWT.

The number of recaptured ducks banded in previous years at Willow Lake dropped slightly to 14 from 22 in 2002. No ducks banded at other banding stations were captured at Willow Lake in 2003. Most (99%) of 988 recaptures were banded locally this year, with the highest single-day totals during 21-29 August (Table 2).

Fluctuations in water levels again played a major factor this year. Even with periodic rainfall, water level dropped significantly and was considerably lower than experienced in 2002. This required our relocating traps to sites further from shore than last year. Trap-related mortality due to exposure was 0.4% of all captured ducks. This is the lowest mortality rate recorded yet for this project. This was also the first year in which there was no trap related mortality of captured

ducks due to predation. No predators had to be removed from the trap sites in 2003, which is likely a result of the offshore trap placement.

The banding crew was flown from Willow Lake to Tulita and Norman Wells on 31 August by floatplane (Plateaus 'Porter'- North-Wright Airways Ltd., Norman Wells). On this flight, we also returned equipment-requiring maintenance or secure storage to our RWED storage facilities in Norman Wells. The project's boats, *Go-Devil* motor, carousel, tools, and some unused barley were stored until next year in the silo at Willow Lake. All traps and floats were stored in the bush at the east side of the Willow Lake outlet.

A total of 12,557 ducks from 13 different species have been live-captured and banded at Loche and Willow Lakes from 1995 to 2003 (Table 3). We have observed considerable annual variation in capture data by species composition, age and sex ratios, and total number (Table 4). Mallards and northern pintails have accounted for 55% and 25%, respectively, of all birds banded, followed by American green-winged teal (12%) and American wigeon (7%). The age ratio of banded ducks in 2003 was heavily weighted towards juvenile ducks, which indicates this was an excellent year for production at Willow Lake. In fact, this was the best year for production at Willow Lake since 1997. There were 846 juvenile ducks banded (63%) and 502 adults (37%) banded this year (Table 5).

Approximately 12% of all bands deployed at Willow Lake since 1995 have been recovered (Figure 1). Annual variation in band return rates may reflect the annual variation in species banded and the use of 'reward bands' in some years (Table 6). Band returns are almost equally divided between the 3 western flyways: 36% from the Mississippi Flyway, 33% from the Central Flyway, and 30% from the Pacific Flyway (Figure 2). Mallard and northern pintail band returns are also approximately evenly distributed between these three flyways (Table 7). Nine incidentally captured and banded species amount to less than 1% of our band recoveries.

This was the fourth year that data was entered in the field on lap top computer using *Band Manager* software (USFWS, CWS, Bird Studies Canada). Banding schedules were also completed in the field and promptly received in good order at the Bird Banding Office (Canadian Wildlife Service, Ottawa, ON) prior to the start of the duck-hunting season.

The Willow Lake duck-banding site has demonstrated it can meet the banding objectives for mallards, and occasionally for northern pintails, as part of the United States/Canada "Waterfowl Banding Program." The project continues to be a model of co-operation between the United States federal government, the Canadian federal government, the Government of the North West Territories, and a local community organization. The TRRC is given responsibility for involvement in, and approval of, wildlife research and management projects in and near their district under the terms of the Sahtu Dene and Métis Comprehensive Land Claim Agreement (DIAND 1993). The Tulita Lands Corporation is responsible for approving terms of access to selected (i.e., private) lands in Tulita District, which includes the Willow Lake watershed. The TRRC and RWED are committed to continuing this project on a long-term basis in conjunction with the USFWS.

RECOMMENDATIONS:

1. Purchase and deliver 2265 kg (5000 lb) of barley on the winter road to Norman Wells in Jan-Mar 2004.
2. It is essential to continue to have one biologist, preferably a USFWS Waterfowl Biologist on site throughout the banding season. A two-person banding crew hired by the Tulita Renewable Resources Council should assist the biologist. The banding crew should preferably have previous duck banding experience and a good knowledge of the Willow Lake area.
3. The Sahtu Renewable Resources Board should be encouraged to continue to hire appropriate summer students to work on this project. One summer student at a time is the maximum that the project and facilities can accommodate. A period of two weeks is suggested for each summer student to work on the project.
4. Construct wire mesh triangle corners for each of the eighteen B-2 funnel traps exits. This will direct exiting ducks into the catch box.
5. Schedule annual trap replacement with two new B-2 traps per year starting 2004.
6. Maintain an annual end-of-season inventory of all project equipment and supplies.
7. Schedule a replacement for the 9.9 hp *Go-Devil*TM outboard motor with a 16 hp *Go-Devil*TM (including sufficient spare parts for field maintenance and repair) for 2007.
8. Inspect, perform any basic maintenance, and paint the tent frames prior to the start of the next field season in August 2004.

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ACKNOWLEDGEMENTS:

We particularly thank the Board of Directors and Wilfred Lennie (President) of the Tulita Renewable Resources Council for their continuing long-term commitment to this project. We thank contract crewmembers Albert Bernarde and Peter Horassi for their assistance banding ducks in the field.

The Sahtu Renewable Resources Board (Jody Snortland, Executive Director) provided the funding and opportunity for Denver Clement and William Andrew (Tulita) to participate in the project as summer student assistants.

Pilot/owner Warren Wright (North-Wright Air Ways Ltd., Norman Wells) and pilot/owner Blair Jensen (Ursus Aviation Ltd., Tulita) capably demonstrated their ability to deliver grain, equipment, and personnel to the Willow Lake camp.

Karen Tiedt (USFWS, Portland, OR.) kindly arranged for the purchase of barley from Larry Taschuk of Two Hills, Alberta and then for delivery by truck to Norman Wells on the winter road.

Celina Stroeder, Sahtu Region Superintendent (RWED) in Norman Wells authorized use of departmental resources and staff-time. The following RWED employees assisted with the project: Sam Kivi (Manager, Corporate Services) provided administrative and financial accountability; Tim Melnyk (Warehouse Store-person) loaned equipment; James Auld (GIS Specialist) produced the figures in the report; Paul Rivard (Forestry Manager) arranged flying time from the RWED Forestry fire suppression contract helicopter to sling field equipment to Willow Lake, including the grain silo.

Carl Ferguson (Flyway Biologist, USFWS) designed and provided the excellent “duck friendly” and efficient catch box.

Funding and logistical support were provided by the USFWS, SRRB, and the RWED. Jim Voelzer (USFWS) assisted with project planning.

**UNITED STATES/CANADA CO-OPERATIVE WATERFOWL BANDING REPORT,
WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES,
AUGUST 2004**

Richard Popko	Wildlife Technician, Dept. of Resources, Wildlife, & Economic Development (DRWED), Government of the Northwest Territories (GNWT), Norman Wells, NT, Canada.
John Bidwell	Flyway Biologist, Office of Migratory Bird Management, Waterfowl Population Surveys, United States Fish and Wildlife Service, Old Town, ME, USA.
Alasdair Veitch	Supervisor Wildlife Management, DRWED, GNWT, Norman Wells, NT, Canada.

ABSTRACT:

In 2004, the Tulita Renewable Resources Council (TRRC), the Government of the Northwest Territories' Department of Resources, Wildlife and Economic Development (DRWED), and the United States Fish and Wildlife Service (USFWS) collaborated in the tenth consecutive year (1995-2004) of duck banding at Willow Lake (65°14' N; 125°25' W) in the Mackenzie River Valley, Sahtu Settlement Area, NWT. Our annual goal for this site is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to the opening day of duck hunting in the NWT (01 Sep). Funding for the project was provided by the USFWS, the Sahtu Renewable Resources Board (SRRB), and DRWED. A Waterfowl Biologist (USFWS) supervised two contract Banding Assistants (contract between DRWED and TRRC) and two Summer Students hired by the SRRB for two weeks each. A maximum of 20 funnel traps were set for a total of 470 trap-nights during 9 to 30 August. A total of 1825 kg (4022 lb) of barley was used as bait. Standard leg bands were placed on 1298 ducks: 509 northern pintails (39% of all ducks banded), 479 mallards (37%), 221 American wigeons (*A. Americana*; 17%), 81 American green-winged teals (*A. crecca*; 6%), 5 blue-winged teals (*A. discors*), 2 northern shoveler (*A. clypeata*), and one American black duck (*A. rubripes*). The 1298 ducks banded in 2004 is similar to the ten-year average for Willow Lake (N = 1386). Captures of ducks peaked on 12 August with 141 ducks banded (11% of the 2004 total). Fifteen percent of banded ducks (N = 196) were in the hatch-year or local age-class, which represents low production in 2004. Water levels dropped dramatically throughout August and were at the lowest level in seven years. Traps located at greater distances from shoreline cover than in previous years contributed toward eliminating mortality of trapped ducks due to predation. Capture-related mortality due to exposure was very low at 0.2% (N = 2). Seventy-three recaptured ducks were banded locally in previous years. Five ducks banded at other locations were also recovered and released.

NARRATIVE:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area of the Northwest Territories (NWT), sometimes support dense summer populations of molting, non-breeding adult ducks, particularly when drought conditions occur in more southern breeding areas. In some years there is high productivity, whereas in others there are many fewer ducks.

In 2004, the United States Fish and Wildlife Service (USFWS) again collaborated with the Tulita Renewable Resources Council (TRRC) and the Department of Resources, Wildlife, & Economic Development (DRWED) to achieve the tenth consecutive year of duck banding within the Sahtu. The annual goal of the project is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally-captured ducks (up to 1000 per species) prior to 01 September, which is the opening day of the duck hunting season in the NWT.

In 1995, the project was established at Loche Lake northeast of Tulita (Popko et al. 1995); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 the banding station was moved to the nearby and larger Willow Lake (65°14' N; 125°25' W) where it has since remained (Popko et al. 1997, 1998, 2002, 2003; Bidwell et al. 1999, 2000, 2001). Our camp and trap-site locations were moved from the inlet of Willow Lake (north end) to the better sandy substrate area found near the outlet of Willow Lake (south end) in 2002. We have continued to use the south end of the lake for the project in 2003 and 2004. Willow Lake lies within the private lands of the Sahtu Dene and Metis (Dept. of Indian and Northern Affairs Canada, 1993). Permission to enter onto these private lands, and to construct and occupy a base camp for the duration of this project, was obtained from the Tulita Lands Corporation (TLC) with the support of the TRRC. Our camp now consists of two tent frames and a grain storage silo. The silo provides secure storage for grain, food, and supplies from weather and pests.

The USFWS ordered barley from Alberta to be used as trap-bait. Northwest Transport Ltd., Edmonton, delivered 2265 kg (5000 lb) of barley to Norman Wells in January 2003 during the mid-January to mid-March winter road season. Trucking is only possible at this time of year and is the most economical and efficient method of transporting grain to the Sahtu for this project. Currently, no bait is onsite for duck banding in summer 2005.

There are no roads in the vicinity of Willow Lake; therefore, logistic support for this project including the transport of personnel, equipment, tools, fuel, food, and banding supplies to and from the banding site requires chartered float-equipped fixed-wing aircraft with short take-off and landing capabilities.

USFWS Waterfowl Biologist, John Bidwell (JB) arrived in Norman Wells on 30 July to finalize

checking equipment and supplies arranged by Richard Popko (RP). The TRRC annually has a contract for this project arranged by DRWED using funds provided by the USFWS. A two-person crew of Banding Assistants (Paul Bernarde and Peter Horassi) was hired for 2 weeks each by the TRRC. In addition, the Sahtu Renewable Resources Board (SRRB) hired two Summer Students (Joel Doctor (JD) and Clarence Andrew) to work on the project and gain valuable experience for 2 weeks each.

On 01 August, Peter Horassi was flown from Tulita to Willow Lake in a *Maule Rocket*TM (*Ursus Aviation Ltd.*, Tulita). The aircraft shuttled between Norman Wells and Willow Lake to pick up and transport JB and JD, bait, camp and food supplies, and replacement B-2 traps. On 16 August, Wilfred Lennie (President, TRRC) inspected the campsite and observed the trapping procedure. He also arranged transportation for the crew rotation and delivery of supplementary food and gasoline. Staff with Forest Management Division (DRWED, Norman Wells) graciously delivered a food drop to camp using their contract helicopter. Albert Bernard and Clarence Andrew assisted JB during the latter half of August. Only one assistant had previous banding experience, so training was continuous. This effort offers a larger pool of experienced personnel for future years. Both crews worked well and were quick to learn techniques and procedures. Communications were maintained between the banding crew and DRWED in Norman Wells and the TRRC office by single-side-band HF radio, Forest Management's radio system, and by satellite telephone.

Generator-produced electricity at camp was essential for computer data entry and to run a freezer for food storage. DRWED and SRRB policy does not allow crewmembers to subsistence hunt during a project. All garbage was removed from site and taken for disposal at the Norman Wells landfill. At least 1 black bear (*Ursus americanus*) and a pack of timber wolves (*Canis lupus*) were effectively deterred from entering camp by a solar-powered electric fence that surrounds the campsite.

Within the study area, the banding crew traveled in a 5.5 m (18 ft.) flat-bottomed boat with a 9.9 hp *Go-Devil*TM motor. The operation of this shallow draft boat and motor is essential for efficient daily trap checking in the shallow weed-choked waters at Willow Lake. Water levels were at the lowest level in the crew's recent memory. Use of a 4.3 m (14 ft.) *Lund*TM with a 9.9 hp outboard motor was restricted to the river near camp.

Prior to going into the field, JD made two new B-2 traps and triangular trap corner inserts for all traps. Most of the traps cached at Willow Lake last summer were in good condition. Two rolls of trap wire arrived in Norman Wells by Mackenzie River barge in August 2004 to make replacement traps for 2005.

The B-2 funnel trap set-up was similar to previous years. Trap-site locations were based upon

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previous trapping success (Popko et al. 2003). Traps were only set at Willow Point, which resulted in a more concentrated trap configuration than in previous years. Traps were placed further offshore than in other years. Trap-site substrate - detritus and muck - provided a reasonable trap base that deteriorated with distance from shore. Twenty traps were set up on 2 and 3 August, prebaited on 4 and 5 August, and closed 6 August. The use of triangular trap corner inserts facilitated funneling ducks into the trap cage. Traps had to be relocated several times throughout August to accommodate the continuously dropping water levels. Traps remained set until 30 August for a total of 470 trap-nights (TN), which is greater than the trapping effort of 423 TN in 2003. Overall trapping success was 2.76 ducks per TN. Ducks were live-captured and banded at Willow Lake from 7 to 30 August using a total of seventy three bags (1825 kg) of barley for bait.

The first duck was caught on 8 August (Table 1). This year's total capture of 1298 ducks banded is similar (less than 5% difference) to our ten-year annual average of 1386 ducks banded (Table 4). Northern pintails (N = 509) and mallards (N = 479) comprised 76% of all ducks banded (Table 1). The most productive capture period for northern pintails and mallards was after daily captures peaked on 12 August (141 ducks banded). Peaks in daily trapping success coincided with the occurrence of cold fronts passing through the area. The number of American green-winged teal (*A. crecca*) banded this year (N = 81) dropped significantly from 435 banded in 2003. Likewise, fewer American wigeon (*A. americana*) were banded this year (N = 221) compared to last year (N = 312). Similar to other years, low numbers of a few incidentally captured duck species were banded including: five blue-winged teals (*A. discors*), two northern shovelers (*A. chryseata*) and one American black duck (*A. rubripes*), which is an unusual species in the NWT. Most recaptured ducks banded in previous years at Willow Lake were banded in 2002 and 2003 (92%, N = 78) dropped slightly. 2002. Six No-ducks banded at other banding stations were recaptured and released at Willow Lake-2003 (Table 2).

Fluctuations in water levels again played a major factor this year. Even with periodic rainfall, water level dropped significantly and was considerably lower than experienced in 2003-2002. This required relocating traps to sites further from shore than previous years. Trap-related mortality due to exposure was 0.150.4% of all captured ducks. Willow Point trap site is exposed and vulnerable to wind and increased wave action reduces trapping success at this site. This was the first-second year in which there was no trap related mortality of captured ducks due to predation. This is the lowest mortality rate recorded yet for this project, 2003 which is likely a result of the offshore trap placement. No predators had to be removed from the trap sites.-2003

The banding crew was flown from Willow Lake to Tulita and Norman Wells on 31 August by float plane. On this flight, we also returned equipment requiring maintenance or secure storage to our DRWED storage facilities in Norman Wells. The project's boats, *Go-Devil* motor, carousel, and some camping equipment and supplies were stored in the silo at Willow Lake for next year's banding project. All traps and floats are stored in the bush at the east side of the Willow Lake outlet.

A total of 13,85542,557 ducks from 11 different species (not including hybrids) have been live-

captured and banded at Loche and Willow Lakes from 1995 to 2004 (Table 3). We have observed considerable annual variation in capture data by species composition, age and sex ratios, and total number (Table 4). Mallards and northern pintails have accounted for 53.5% and 26.25%, respectively, of all birds banded, followed by American green-winged teal (11.42%) and American wigeon (8.7%). There were 196.846 juvenile ducks banded and 1102.502 adults (85.37%) banded this year (Table 5). The age ratio of banded ducks in 2004 was heavily weighted towards adult ducks, which indicates this was a year of low production at Willow Lake. This was the best year for adult female ducks captured at Willow Lake since 1997, which may be indicative of a late spring overflight of the prairies where dry conditions prevailed (Ferguson, 2004). The arrival of spring for northeastern Alberta and the NWT was the latest in recent record and may have adversely affected nesting attempts or success.

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Approximately 12.42% of all bands deployed at Willow Lake since 1995, including 6% of ducks banded locally last year, were recovered (Table 6; Figure 1). Annual variation in band return rates may reflect the annual variation in species banded and the use of 'reward bands' in some years (Table 6). Band returns are almost equally divided between the 3 western flyways: 37.33% from the Central Flyway, 35.36% from the Mississippi Flyway and 28.30% from the Pacific Flyway. Mallard and northern pintail band returns are also approximately evenly distributed among these three flyways (Figure 1). Nine incidentally captured and banded species amount to less than 1% of our band recoveries.

Data were entered at camp on a laptop computer using *Band Manager* software (USFWS, Canadian Wildlife Service (CWS), Bird Studies Canada). Completed *Banding Schedules* were promptly received by electronic mail in good order at the Bird Banding Office (CWS, Ottawa, ON) prior to the opening day of the duck-hunting season. More old and foreign recaptures were recorded this year than in previous years and *Band Manager* made checking these band recoveries very easy and manageable.

The Willow Lake duck-banding site has demonstrated it can meet the banding objectives for mallards, and occasionally for northern pintails, as part of the United States/Canada *Waterfowl Banding Program*. The project continues to be a model of co-operation between the federal governments of the United States and Canada, the Government of the NWT, a wildlife co-management board, and a small aboriginal community. Under the terms of the Sahtu Dene and Métis Comprehensive Land Claim Agreement (Department of Indian and Northern Affairs Canada, 1993) the TRRC is given responsibility for involvement in, and approval of, wildlife research and management projects in and near their community. The Tulita Lands Corporation is responsible for approving terms of access to selected (i.e., private) lands within the Tulita District, which includes portions of the Willow Lake watershed. The TRRC and DRWED are committed to continuing this project on a long-term basis in conjunction with the USFWS.

RECOMMENDATIONS:

1. Purchase and deliver 2265 kg (5000 lb) of barley on the winter road to Norman Wells during Jan-Feb 2005.

2. Cost-reduction measures for 2005 include: hauling barley by snow machine to Willow Lake in March to reduce aircraft charter cost, prebaiting the trap-site at Willow Point during late July, and delay the start of banding to reduce expenses for manpower and logistic support.
3. It is essential to continue to have one biologist, preferably a USFWS Waterfowl Biologist, on site throughout the banding season. A two-person banding crew selected by the TRRC, SRRB,, and DRWED should assist the biologist. A two-week crew rotation increases crew-training opportunity. At least one local crew member should have prior duck banding experience and knowledge of the Willow Lake area.
4. Encourage the SRRB to continue hiring appropriate summer students to work on this project. One summer student at a time is the maximum that the project and facilities can accommodate. An optimal period of two weeks is suggested for each summer student's participation on the project.
5. Continue trap replacement with two new B-2 traps per year.
6. Maintain an annual end-of-season inventory of all project equipment and supplies.
7. Purchase a replacement for the *Go-Devil*™ boat motor (including sufficient spare parts for field maintenance and repair) for use during 2005.
8. During Jun-Jul 2005, inspect the camp, perform any basic maintenance, and paint the tent frames prior to the start of the next field season.
9. Prebait the Willow Point banding site about 25 July 2005 with six bags of barley.

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ACKNOWLEDGEMENTS:

We particularly thank the Board of Directors and Wilfred Lennie (President) of the Tulita Renewable Resources Council for their continuing long-term commitment to this project. We thank contract crew members Paul Bernarde and Peter Horassi for their assistance banding ducks in the field.

The Sahtu Renewable Resources Board (Jody Snortland, Executive Director) provided the funding and opportunity for Joel Doctor and ~~William Andrew~~ Clarence Andrew to participate in the project as summer student assistants. Their participation in the bush is appreciated.

Pilot/owner, Blair Jensen (*Ursus Aviation Ltd.*, Tulita) capably demonstrated his ability to deliver grain, equipment, and personnel to and from the Willow Lake camp.

Karen Tiedt (USFWS, Portland, OR.) assisted with the financial arrangements. Jim Voelzer (Section Chief, USFWS, Portland, OR) assisted with project planning.

Steve Hannah, Sahtu Region Superintendent (DRWED) in Norman Wells authorized use of departmental resources and staff-time. The following DRWED employees assisted with the project: Sam Kivi (Manager, Corporate Services) provided administrative and financial accountability; Tim Melnyk (Warehouse Storesperson) loaned equipment; Paul Rivard (Manager, Forest Management) authorized helicopter assistance, James Auld (GIS Specialist) produced the figures in the report.

Funding and logistical support were provided by the USFWS, SRRB, and the DRWED.

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**UNITED STATES/CANADA CO-OPERATIVE WATERFOWL BANDING REPORT,
WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES,
AUGUST 2005**

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ABSTRACT:

In 2005, the Tulita Renewable Resources Council (TRRC), the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR), and the United States Fish and Wildlife Service (USFWS) collaborated in the 11th consecutive year (1995-2005) of duck banding at Willow Lake (65°14' N; 125°25' W) in the Mackenzie River Valley, Sahtu Settlement Area, NWT. Our annual goal is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to the opening day of duck hunting in the NWT (01 September). The USFWS, Sahtu Renewable Resources Board (SRRB), and ENR provided funding for the project. A Waterfowl Biologist (USFWS) supervised two contract Banding Assistants and two Summer Students hired by the SRRB. A maximum of 13 funnel traps were set for a total of 293 trap-nights during 8 to 30 August. Trap success was 3.5 ducks per trap night with no trap-related mortality. A total of 1373 kg (3030 lb) of barley was used as bait. Standard leg bands were placed on 1019 ducks: 369 mallards (36% of all ducks banded), 327 northern pintails (32%), 283 American wigeons (*A. americana*; 28%), 32 American green-winged teals (*A. crecca*; 3%), and 8 blue-winged teals (*A. discors*). The 1019 ducks banded in 2005 is below our 11-year average of 1352 ducks. Trapping success increased substantially after August 16 and peaked on 25 August with 123 ducks banded (12% of the 2005 total). Sixty nine percent of banded ducks (N = 703) were in the hatch-year or local age-class, which represents a high level of production in 2005. Water levels were so low that float-equipped aircraft could not land at or near the banding station; therefore, helicopters were used instead. Traps were set at two sites - Willow Point (2 traps) and a new site at Cache Point (11 traps) at the mouth of Brackett River. Only 4 ducks that were banded locally in previous years were recaptured; 2 ducks banded at other locations were recaptured and released.

BACKGROUND:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area of the Northwest Territories (NWT), sometimes support dense summer populations of molting, non-breeding adult ducks, particularly when drought conditions occur in more southern breeding areas. In some years, such as 2005, there is excellent hatching success and productivity.

Since 1995, the United States Fish and Wildlife Service (USFWS) has collaborated with the Tulita Renewable Resources Council (TRRC) and the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR) to band ducks within the Sahtu. The annual goal of the project is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to 01 September, which is the opening day of the duck-hunting season in the NWT.

The project was initially established at Loche Lake northeast of Tulita in 1995 (Popko et al. 1995; Figure 1); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 the banding station was moved to the nearby and larger Willow Lake (65°14' N; 125°25' W) where it has since remained (Popko et al. 1997, 1998, 2002, 2003, 2004; Bidwell et al. 1999, 2000, 2001). In 2002, the banding project camp and trap-site locations were moved from the inlet of Willow Lake to the better sandy substrate area found near the outlet of Willow Lake in 2002 (Figure 1, 2003, 2004).

Willow Lake lies within the selected (i.e., private) lands of the Sahtu Dene and Métis under the terms of the Sahtu Dene and Métis Comprehensive Land Claim Agreement (Dept. of Indian and Northern Affairs Canada, 1993). The Tulita Lands Corporation is responsible for approving terms of access to private lands within the Tulita District, including the Willow Lake watershed. Further, the land claim gives the TRRC responsibility for involvement in, and approval of, wildlife research and management projects in and near their community. Therefore, we obtained permission to enter these private lands, and to construct and occupy the project's base camp, from the Tulita Lands Corporation with the support of the TRRC. The Willow Lake banding project camp now consists of two tent frames and a grain storage silo. The silo provides storage for large quantities of bait, food, and supplies, which reduces transportation costs.

The Willow Lake area has been identified as a Conservation Zone in the draft Sahtu Land Use Plan. Further, the lake and the extensive wetland complex along the Brackett River south to the Bear River have been proposed as a candidate area under NWT Protected Area Strategy through the Tulita Conservation Initiative. These proposed designations would prohibit non-renewable resource development and protect these critical waterfowl wetlands.

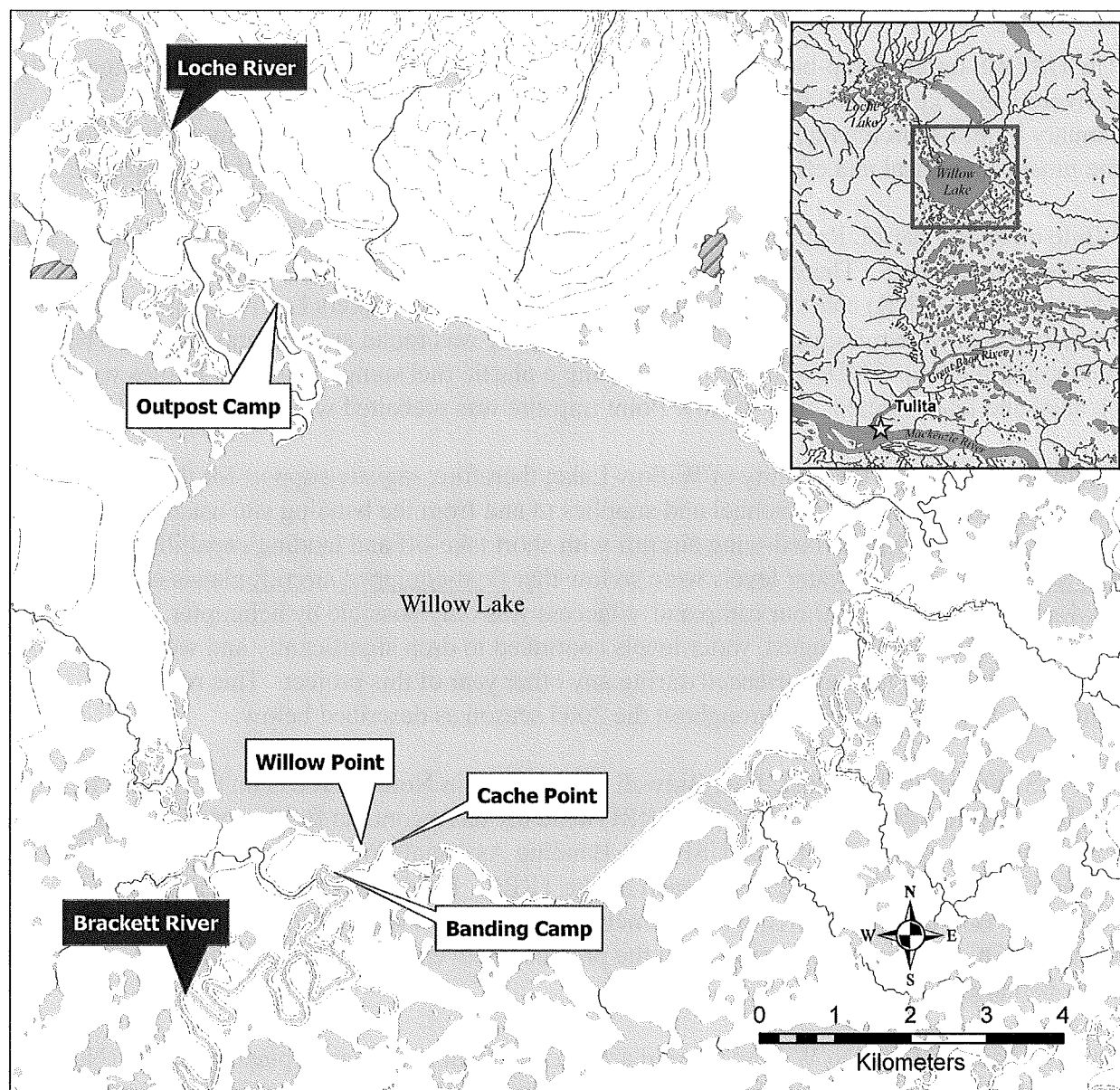


Figure 1. Willow Lake duck banding camp, Tulita District, Northwest Territories.

NARRATIVE:

The USFWS ordered trap-bait barley from Alberta. Northwest Transport Ltd., (Edmonton, AB) delivered 4530 kg (10,000 lb) of barley to Norman Wells in February 2005 during the mid-January to mid-March winter road season. Trucking is only possible at this time of year and is the most economical and efficient method of transporting grain to the Sahtu for this project.

While on spring patrol, Ron Doctor (Renewable Resource Officer – Tulita, ENR), found the silo had been vandalized. Therefore, on 28 & 29 July, Richard Popko (RP) used Forest Management's (ENR) charter *A Star* helicopter (Canadian Helicopters Ltd.) to inspect the camp: some supplies were missing, the 9.9 hp outboard motor was found cracked and mutilated beyond repair, and the 9 hp *Go Devil* motor was missing a plastic fuel sump. Both tent frames were cleaned and tents erected. The Willow Point trap site was prebaited with 150 kg of barley.

There are no roads in the vicinity of Willow Lake; therefore, logistic support for this project including the transport of personnel and supplies to and from the banding site usually requires chartered float-equipped fixed-wing aircraft with short take-off and landing capabilities.

However, this year's water levels were so low that float-equipped aircraft planes could not land and could not land near our camp and access was only possible by helicopter. Even with periodic rainfall during August, water levels continued to drop significantly and were considerably lower than experienced during any other year of this project. This required relocating traps continuously throughout the 2005 season as described below.

USFWS Waterfowl Biologist, John Bidwell (JB) arrived in Norman Wells on 01 August to finalize supplies arranged by RP. The TRRC annually has a contract for this project arranged by ENR using funds provided by the USFWS. Banding Assistants Paul Bernarde (PB) and Peter Horassi (PH) were hired for 2 weeks each by the TRRC. In addition, the Sahtu Renewable Resources Board (SRRB) hired two Summer Students - Jonathan Andrew (JA) and Denver Clement (DC) - to work concurrently on the project. Both crews worked well and had prior local duck banding experience.

On 03 August, JB flew to Willow Lake in a *Fairchild Plateau Porter* airplane on floats (North-Wright Airways Ltd., Norman Wells). The water level was too low for a safe landing near the banding station and had to return to Norman Wells. JB and RP chartered a Bell 206 *Long Ranger* (Sahtu Helicopters Ltd., Norman Wells) to the banding station to assess the situation.

On 4 August, PB and JA were flown from Tulita to Willow Lake in an *A Star* helicopter (Canadian Helicopters, Norman Wells). The helicopter shuttled between Norman Wells and Willow Lake to deliver a new *Go Devil* 16 hp motor, bait, camp and food supplies, and to pick up RP. Staff with Forest Management Division (ENR, Norman Wells) graciously allowed use of their contract *A Star* helicopter (Canadian Helicopters Ltd.) when it was in the Willow Lake area for Forest Management purposes. They delivered additional grain, supplies, and heli-slung a 4-

wheel drive all-terrain 'quad' throughout the month.

On 13 August, DC replaced PB until 19 August when he required medical attention and went to Tulita with JA. The banding crew was reduced to two persons (PH and JB) until RP arrived 29 August to assist with removal and storage of duck traps and to close the camp. All traps were removed from the trap sites by 30 August and stored at Cache Point.

On 17 August, the project was visited by a Boreal Forest Initiative media crew coordinated by Jason Charlwood (*Ducks Unlimited Canada*, Yellowknife). Photographers and writers were given demonstrations of the banding procedures and were briefed on the USFWS Division of Migratory Bird Management's 50th anniversary of aerial waterfowl population surveys in the NWT and elsewhere across western Canada.

Daily communications were maintained between the banding crew and ENR in Norman Wells and the TRRC office by Forest Management's radio system, satellite telephone, and single-side-band radio. Generator-produced electricity at camp is essential for computer data entry and to run a freezer for food storage. ENR and SRRB policies do not allow crew members to subsistence hunt during a project. All garbage was removed from site and taken for disposal at the Norman Wells landfill. At least 1 black bear (*Ursus americanus*) and a pack of timber wolves (*Canis lupus*) visited camp and trap sites without causing any problems.

Due to the extremely low water levels, boat access to the preferred trap site at Willow Point was not possible. The only other possible trap location with a sufficiently solid sandy substrate and boat access was shoreline adjacent to Cache Point. The banding crew traveled in a 5.5 m (18 ft) flat-bottomed boat with a new 16 hp *Go-Devil* motor to Cache Point. On 12 August, a 4 x 4 quad all terrain vehicle was slung from Norman Wells to Willow Lake. As the shoreline dried it became possible to drive this quad back and forth to the banding site at Willow Point. The quad was slung back to Norman Wells with a helicopter at the end of August.

Most of the traps cached at Willow Lake at the end of the 2004 banding season were in good condition. One roll of trap wire was used to make two replacement B-2 funnel traps at camp. Some new 2"-thick high-density styrofoam floaters replaced worn-out floaters. Compared to traps positioned facing away from shore, traps positioned with the throat towards shore had less weed build up in the funnel during windy conditions and caught more ducks than traps facing the lake. Overall, fewer traps were set than in other years due to limited suitable trap site locations. Twelve traps were set up by 8 August at Cache Point. One of these traps was moved to Willow Point along with an additional trap on 16 August. Traps had to be moved throughout the month as the water level continuously dropped.

The project's boat, motors, carousel, floaters, some camping equipment, bait (1425 kg), and supplies are inside the silo at Willow Lake for next year's banding project. All traps are stored in the bush at the east side of the Willow Lake outlet.

RESULTS:

Traps remained set until 30 August a total of 293 trap-nights (TN), which is less than the trapping effort of 470 TN in 2004. However, overall trapping success (3.5 ducks per TN) is greater than the trapping success of 2.8 ducks per trap last year. (Popko et al. 2004). Ducks were live-captured and banded at Willow Lake from 8 to 30 August; however, most captures occurred after 18 August when a cold front brought wind, rain, cool temperatures, and therefore - ducks. Trapping success greatly improved during the second half of the month and many ducks were still using the trap sites on 31 August. A total of 55 bags (1375 kg) of clean, germ-free barley were used for bait.

The first duck was caught on 8 August (Table 1). Before 16 August, only 12 ducks were banded and very few ducks were at the trap sites. The most productive capture period was 21 to 25 August with a daily average capture of 101 ducks banded each day. Eighty-eight percent of ducks banded were caught between 20 to 30 August, similar to daily trapping success for 1995 to 2005 (Figure 2). Mallards (N = 369) and northern pintail (N = 327) comprised 68% of all ducks banded (Table 1). This year's total capture of 1019 ducks banded is 25% less than our 11-yr annual average of 1352 ducks banded (Table 2). This is likely a result of the overall lower-than-normal numbers of adult ducks in the Mackenzie Valley this year (Ferguson 2005).

The number and variety of incidentally caught species is low (Table 3), with the exception of American wigeon (*A. americana*). The 274 American wigeon banded between 2002 and 2005 is a substantial increase from the total of 65 banded during the entire 1995-2001 period. The 32 American green-winged teal (*A. crecca*) banded this year is below the species' 11-yr average of 144. Eight blue-winged teal (*A. discors*) were the only other incidentally captured ducks. Only 4 ducks banded in previous years at Willow Lake were captured in 2005. Only two ducks banded at other banding stations were recaptured and released at Willow Lake. Remarkably, one of these recaptures was a 12-yr-old mallard banded at Old Crow in the northern Yukon Territory.

There was no trap related mortality of captured ducks due to predation or exposure. A pack of wolves were present all month leaving tracks near many traps. Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) were also seen regularly at the trap sites. Sandhill crane (*Grus canadensis*) usage of the baited site was extensive with about 35 cranes on site throughout August. On two occasions cranes were incidentally trapped and released unharmed.

A total of 14,874 ducks from 11 different species and 2 hybrids have been live-captured and banded at Loche and Willow Lakes from 1995 to 2005 (Table 3). We have observed considerable annual variation in capture data by species composition, sex ratio, total number, and age -class (Tables 4 & 5). Mallards and northern pintails have accounted for 52% and 27%, respectively, of all birds banded (Table 3), followed by American green-winged teal (11%) and

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American wigeon (10%).

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Table 1. Daily number of ducks banded during August 2005 at Willow Lake, NWT

Date	Mallard	Northern Pintail	American Wigeon	Green-winged Teal	Blue-winged Teal	Total
8	1					1
9						0
10						0
11						0
12						0
13						0
14			4			4
15	2		5			7
16	7	2	8	5		22
17	7	1	7	1	7	23
18	10	10	2			22
19	25	3	12	1		41
20	18	12	44	4		78
21	19	33	52	6	1	111
22	22	42	20	4		88
23	16	53	22	4		95
24	51	31	9	1		92
25	66	26	31			123
26	15	9	45			69
27	25	17	4			46
28	9	3		3		15
29	40	57	11	1		109
30	36	28	7	2		73
Total	369	327	283	32	8	1019

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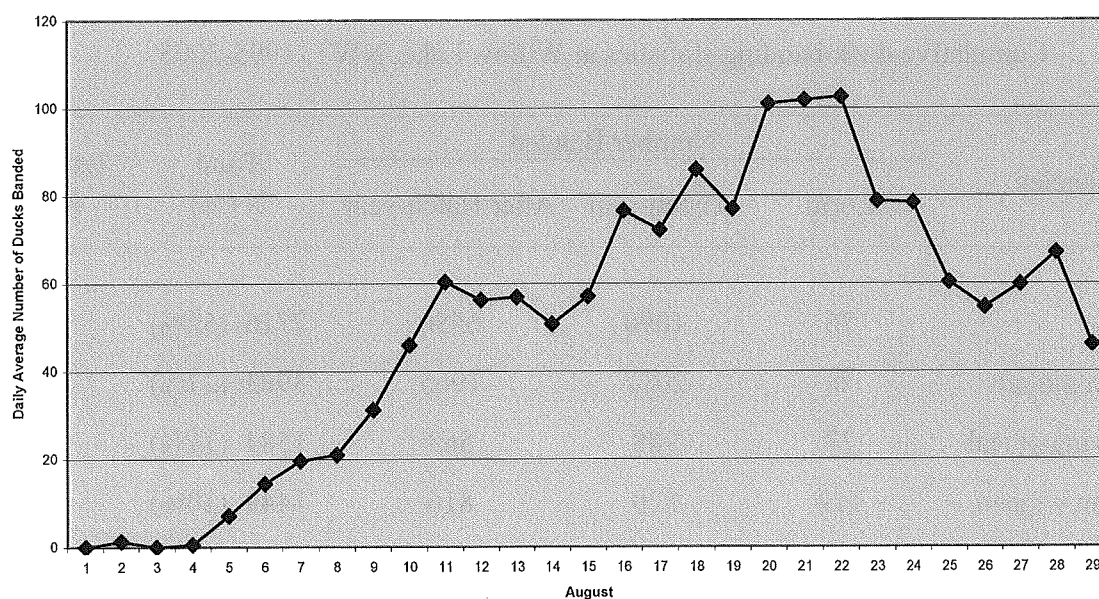


Figure 2. Average daily number of ducks banded at Willow Lake, NWT: 1995 – 2005

Table 2. Band return rate for ducks banded during 1995 to 2004 at Willow Lake, NWT

Year	Number of Ducks Banded	Number of Bands Returned	Band Return Rate (%)
1995	509	64	12.6
1996	1892	232	12.3
1997	1688	162	9.6
1998	1700	286	16.8
1999	1248	267	21.4 *
2000	1600	262	16.4
2001	404	48	11.9
2002	2168	169	7.8
2003	1348	109	8.1
2004	1298	78	6.0
2005	1019	-	-
Total	13,855	1,677	

* US\$100 reward offered for specially marked bands

Table 3. Cumulative duck banding statistics at Willow Lake, NWT, 1995-2005

Species	Number Banded			Total N (%)	Band Return Rate (%)
	Local	Hatch-year	After Hatch-year		
Mallard	76	1090	6550	7716 (52%)	16.4
Northern pintail	6	2012	1965	3983 (27%)	5.0
Green-winged teal	27	988	569	1584 (11%)	5.2
American wigeon	112	520	816	1448 (10%)	8.9
Blue-winged teal	0	18	93	111	
Northern shoveler	2	7	4	13	
Lesser scaup	5	2	1	8	
Gadwall	0	0	4	4	
Redhead	0	0	1	1	
Greater scaup	0	0	1	1	
American black duck	0	0	2	2	
Mallard - black duck hybrid	0	0	1	1	
Mallard - northern pintail hybrid	0	0	1	1	
Total	228 (2%)	4637 (31%)	10,008 (67%)	14,873	12.1

Table 4. Annual duck banding totals by age-class at Willow Lake, NWT: 1995-2005.

Year	Juvenile		Adult		Total
	N	%	N	%	
1995	350	69	159	31	509
1996	227	12	1665	88	1892
1997	1050	62	638	38	1688
1998	535	31	1165	69	1700
1999	90	7	1158	93	1248
2000	42	3	1558	97	1600
2001	48	12	356	88	404
2002	799	37	1369	63	2168
2003	846	63	502	37	1348
2004	196	15	1102	85	1298
2005	703	69	316	31	1019
Total	4886		9988		14874
Mean	444	33	908	67	1352

Table 5. Annual banding totals by species and age-class at Willow Lake, NWT,

Year	Mallard		Northern Pintail		Other Species	
	% Juvenile	% Adults	% Juvenile	% Adults	% Juvenile	% Adults
1995	68	32	95	5	50	50
1996	<1	99	27	72	67	33
1997	19	81	75	25	76	24
1998	21	79	55	45	53	47
1999	3	97	60	40	72	28
2000	<1	99	29	71	35	66
2001	6	94	91	9	53	47
2002	15	85	50	50	38	62
2003	51	49	67	33	66	34
2004	8	92	25	75	10	90
2005	85	15	68	32	52	48
Mean	31	75	58	42	52	48

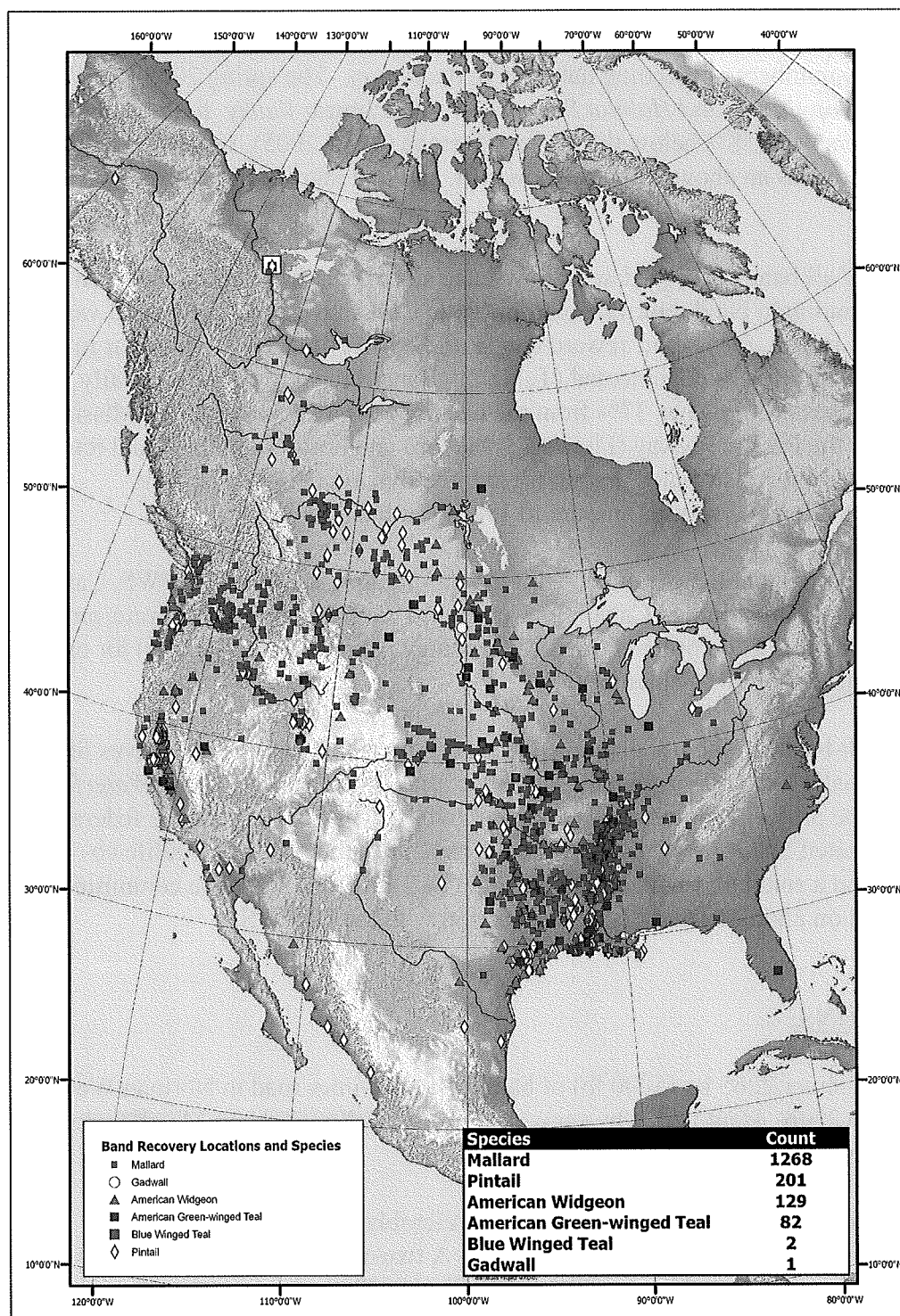


Figure 3: Distribution of band returns from ducks banded at Loche and Willow Lakes, NWT: 1995-2005

There were 703 juvenile (69%) and 316 adults ducks banded this year (Table 4). The age ratio of banded ducks in 2005 was heavily weighted towards hatch-year ducks. This indicates good production by the low numbers of breeding dabblers in the region. The spring 2005 USFWS *Waterfowl Breeding Population and Habitat Survey in the Mackenzie Valley* found that dabbling duck numbers were 58% below the 50-year average (1955-2005), waterfowl habitat was good overall, there was an above-average snowmelt, and that lakes were ice-free by 10 June (Ferguson 2005).

Approximately 12% of all bands deployed at Willow Lake since 1995 have been recovered (Table 2). Annual variation in band return rates from 6% to 21% may reflect the annual variation in species banded and, in part, the use of 'reward bands' (US\$100.00) in 1999 – the year in which the highest band return was documented (Table 2). Band returns are almost equally divided between the 3 western flyways: 37% from the Central Flyway, 35% from the Mississippi Flyway and 28% from the Pacific Flyway (Figure 3). Mallard and northern pintail band returns are also approximately evenly distributed among these three flyways (Figure 3). Nine incidentally captured and banded species amount to 1% of our band returns.

Data were entered at camp on laptop computer using *Band Manager* software (USFWS, Canadian Wildlife Service (CWS), Bird Studies Canada). Completed *Banding Schedules* were promptly received by electronic mail in good order at the Bird Banding Office (CWS, Hull, PQ) for opening day of the duck-hunting season (01 September).

The Willow Lake duck-banding site has demonstrated it can meet the banding objectives for mallards, and occasionally for northern pintails, as part of the United States/Canada *Waterfowl Banding Program*. The project continues to be a model of co-operation between the federal governments of the United States and Canada, the Government of the NWT, a wildlife co-management board, and a small aboriginal community. The TRRC and ENR are committed to continuing this project on a long-term basis in conjunction with the USFWS.

RECOMMENDATIONS:

1. Purchase and deliver 2265 kg (5000 lb) of barley on the winter road to Norman Wells during Jan-Feb 2006. Haul barley by snow machine to Willow Lake in March to reduce aircraft charter cost.
2. It is essential to continue to have one biologist, preferably a USFWS Waterfowl Biologist, on site throughout the banding season. A two-week crew rotation of a two-person banding crew selected by the TRRC, SRRB, and ENR should assist the biologist. Three people are required on-site during project start-up and closeout.
3. Concentrate traps at one or two sites. Willow Point is a superior trap site than Cache

Point. If Willow Point is not accessible by boat, then trap at Cache Point.

4. Place trap openings towards shore to prevent weed accumulation in the trap's funnel.
5. Continue trap replacement with two new B-2 traps per year.
6. The use of an all-terrain vehicle is not recommended. It is too expensive to sling an ATV by helicopter to and from the site each year. Also a quad does not fit into the silo for secure storage and black bears tend to destroy ATV's left in the bush.
7. Encourage the SRRB to continue hiring appropriate summer students to work on this project. One summer student at a time is the maximum that the project and facilities can accommodate. Experience has shown 2 weeks is optimal for each student's participation.
8. Add a canvas cover to the top of the catch box. This prevented ducks from escaping between the inner tubes and creates a 'dark tunnel effect' that encourages ducks to enter the box from the trap.
9. Repair the 9.9 hp outboard motor. Purchase 12-volt battery charger, 12' x 14' x 4' "Prospector" tent, boat plug, 2' x 2' x 1 ½" high-density Styrofoam floaters, a complete set of stovepipes, and an axe.
10. During June 2006, inspect the camp, check inventory, and move one tent frame away from the river. Clear the helicopter approach to the helipad. Since the permafrost is melting in the helipad and creating a pond, build a walkway to the helipad.
11. To condition ducks to feed beside traps, prebait Willow Point and Cache Point trap sites about 25 July 2006 with six bags (150 kg) of barley and an open trap on each site.
12. Be prepared to continue banding into early September if there are lots of unbanded mallards at the traps at the end of August.

ACKNOWLEDGEMENTS:

We particularly thank the Board of Directors and Wilfred Lennie (President) of the TRRC for their continuing long-term commitment to this project. We thank contract crewmembers Paul Bernarde and Peter Horassi for their assistance banding ducks in the field.

The SRRB (Walter Bayha, Chairperson & Jody Snortland, Executive Director) provided the funding and opportunity for Jonathan Andrew and Denver Clement to participate in the project as summer student assistants. Their participation in the bush is appreciated.

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Numerous helicopter pilots with Canadian Helicopters Ltd. and Sahtu Helicopters capably and safely delivered supplies, equipment, and personnel to and from the Willow Lake camp.

Steve Hannah, (ENR Sahtu Region Superintendent, Norman Wells) authorized use of departmental resources and the assistance of the following staff: Tim Melnyk (Warehouse Storesperson) loaned equipment and helped coordinate getting supplies to the camp; Paul Rivard (Manager, Forest Management) authorized helicopter assistance; Nekita Lloyd and Dolly Whiteman (Fire Clerks) maintained daily radio checks with the crew.

Sam Kivi (Manager, Corporate Services, Shared Services Centre, Norman Wells) provided administrative and financial accountability. Funding and logistical support were provided by the USFWS, SRRB, and the ENR. Jim Woltham (Acting Section Chief, USFWS, Laurel, MD) assisted with project planning.

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WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES,
AUGUST 2006

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Comment [JB1]: Migratory Bird Surveys

ABSTRACT:

In 2006, the Tulita Renewable Resources Council (TRRC), the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR), and the United States Fish and Wildlife Service (USFWS) collaborated in the 12th consecutive year (1995-2006) of duck banding at Willow Lake (65°14' N; 125°25' W) in the Mackenzie River Valley, Sahtu Settlement Area, NWT. Our annual goal is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to the opening day of duck hunting in the NWT (01 September). The USFWS, Sahtu Renewable Resources Board (SRRB), Ducks Unlimited (Canada), and ENR provided funding for the project. A Waterfowl Biologist (USFWS) supervised two contract Banding Assistants (TRRC) and two crewmembers hired by the SRRB. A maximum of 19 funnel traps were set for a total of 408 trap-nights during 8 to 30 August. Trap success was 5.1 ducks per trap night with four trap-related mortalities. A total of 1746 kg (3856 lb) of barley was used as bait. Standard leg bands (Call 1-800-327-BAND) were placed on 2083 ducks: 1007 northern pintails (48% of all ducks banded), 535 mallards (26%), 418 American wigeons (*A. americana*; 20%), 114 American green-winged teals (*A. crecca*; 5%), 4 blue-winged teals (*A. discors*), 3 northern shovelers (*A. clypeata*), 1 gadwall (*A. strepera*), and 1 American black duck (*A. rubripes*). The 2085 ducks banded in 2006 is above our 12-year average of 1413 ducks. Trapping success was consistent from August 12 to August 30 with over 100 ducks banded per day on 13 days. Our greatest daily catch occurred on August 15 with 179 ducks banded. Thirty-eight percent of banded ducks (N = 796) were in the hatch-year or local age-class, which is similar to the 1995-2005 station average of 1% local, 31 % hatching year, and 67% after-hatch-year age classes. Water levels were suitable for float-equipped aircraft to land at the banding station. All the traps were set at one site - Willow Point. Seventy-one ducks banded at other banding stations or banded at Willow Lake several years ago were recaptured and released.

BACKGROUND:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area of the Northwest Territories (NWT), sometimes support dense summer populations of molting, non-breeding adult ducks, particularly when drought conditions occur in more southern breeding areas. In some years there is excellent hatching success and productivity.

Since 1995, the United States Fish and Wildlife Service (USFWS) has collaborated with the Tulita Renewable Resources Council (TRRC) and the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR) to band ducks within the Sahtu. The annual goal of the project is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to 01 September, which is the opening day of the duck-hunting season in the NWT.

The project was initially established at Loche Lake northeast of Tulita in 1995 (Popko et al. 1995; Figure 1); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 the banding station was moved to the nearby and larger Willow Lake (65°14' N; 125°25' W) where it has since remained (Popko et al. 1997, 1998, 2002, 2003, 2004, 2005; Bidwell et al. 1999, 2000, 2001). In 2002, the banding project camp and trap-site locations were moved from the inlet of Willow Lake to the better sandy substrate area found near the outlet of Willow Lake (Figure 1, 2003, 2004).

Willow Lake lies within the selected (i.e., private) lands of the Sahtu Dene and Métis under the terms of the Sahtu Dene and Métis Comprehensive Land Claim Agreement (Dept. of Indian and Northern Affairs Canada, 1993). The Tulita Lands Corporation is responsible for approving terms of access to private lands within the Tulita District, including the Willow Lake watershed. Further, the land claim gives the TRRC responsibility for involvement in, and approval of, wildlife research and management projects in and near their community. Therefore, we obtained permission to enter these private lands, and to construct and occupy the project's base camp, from the Tulita Lands Corporation with the support of the TRRC. The Willow Lake banding project camp now consists of two tent frames and a grain storage silo. The silo provides storage for large quantities of bait, food, and supplies, which reduces transportation costs.

The Willow Lake area has been proposed as a Conservation Zone in the draft Sahtu Land Use Plan (Sahtu Land Use Planning Board 2002). Further, the lake and the extensive wetland complex along the Brackett River south to the Great Bear River have been proposed as an Area of Interest under the NWT Protected Area Strategy through the Tulita Conservation Initiative. These proposed designations would prohibit non-renewable resource development and protect these critical waterfowl wetlands.

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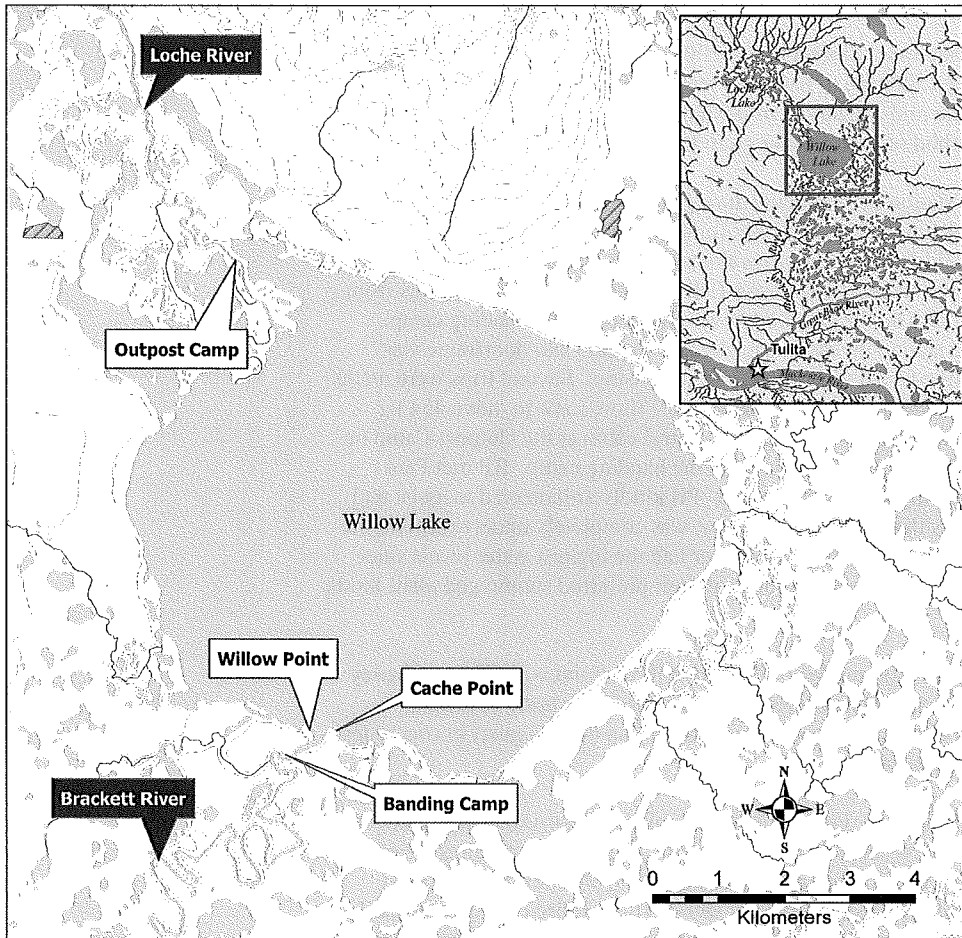


Figure 1. Willow Lake duck banding camp, Tulita District, Northwest Territories.

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NARRATIVE:

The USFWS ordered trap-bait barley from Alberta in fall 2005. *Northwest Transport Ltd.*, (Edmonton, AB) delivered 2265 kg (5000 lb) of barley to Norman Wells in February 2006. Trucking is only possible during the mid-January to mid-March winter road season and is the most economical and efficient method of transporting grain to the Sahtu for this project.

Transporting grain to the banding station by floatplane during spring runoff ensures bait is on-site at a reasonable cost. On 27 and 29 June, Warren Wright (pilot/owner, *North-Wright Airways Ltd.*, Norman Wells) flew a Fairchild *Plateau Porter* on floats from Norman Wells to Willow Lake with 908 kg (2000 lb) of barley and Richard Popko (RP) onboard. High water levels from spring runoff enabled the plane to land on the Brackett River and dock at the banding camp. Both tent frames were cleaned and station inventory checked. The grain silo doorframe was found broken and a few small items of food and supplies were missing. Several trips were made in a 3.7 m (12 ft) *Lund* boat with a 6 hp outboard motor across Willow Lake to move 454 kg (1000 lb) of barley from the Renewable Resource Officer's patrol cabin at the Outpost Camp on the north end of Willow Lake (Figure 1) to the grain silo at the banding camp. RP met Paul Bernarde (PB) and family preparing dry fish at their camp. PB kindly volunteered to assist and hauled one boatload of barley across the lake. Willow Point was completely underwater and the traps stored at Cache Point were partially flooded. This year had the highest water levels since 1998, which subsequently limited ducks' access to some of their preferred submerged plant foods (e.g., quillwort).

Paul Rivard (Manager, Forests, ENR, Norman Wells) baited Willow Point with 75 kg of barley on July 28 while on route from Norman Wells to Deline in an *A Star helicopter* (Canadian Helicopters, Norman Wells). Prebaiting continued during trap set-up (4-8 August) to encourage local ducks to feed on barley at the trap site.

There are no roads in the vicinity of Willow Lake; therefore, logistic support for this project including the transport of personnel and supplies to and from the banding site requires chartered float-equipped fixed-wing aircraft with short take-off and landing capabilities, or helicopter. After mid August, water levels continued to drop significantly. This required cutting horsetail mats (*Equisetum* spp.) to relocate traps to deeper water. Weather was generally warmer and dryer than average. Only two frontal passages with strong winds and cooler temperatures went through the area, limiting the arrival of migrant ducks and banding success.

USFWS Flyway Biologist, John Bidwell (JB) arrived in Norman Wells on 01 August to finalize supplies arranged by RP. The TRRC has a contract for this project arranged by ENR using funds provided by the USFWS and Ducks Unlimited (Canada). Senior Banding Assistants Peter Horassi (PH) and PB were hired for 2 weeks each by the TRRC. In addition, the Sahtu Renewable Resources Board (SRRB) hired two assistants– Derek Widow (DW) and Mathew Menacho (MM) - to work concurrently on the project. Both crews did an excellent job and

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worked well with Flyway Biologist JB. Both Banding Assistants had prior duck banding experience at the project site. Banding training was provided to DW and MM by JB. The necessity for cleanliness was stressed as a precaution against possible disease or parasite transmission. Since 1995, a total of 21 people from Tulita – all Sahtu Dene and Metis - have received duck banding orientation and on-site training.

Comment [JB2]: site

On 3 August, JB flew from Norman Wells to Willow Lake with food and camp supplies in an *A Star* helicopter (Canadian Helicopters, Norman Wells, NT). Forest Management (ENR) allowed use of this contract helicopter on a fuel cost recovery basis if it was available in the Willow Lake area. The first crew of banding assistants, PB and DW, were picked up in Tulita and flown to Willow Lake. Camp was resupplied with perishable foods and supplies on August 10 by ENR's contract helicopter. The crew built a walkway and loading area beside the helipad to improve access.

A catch-box modification suggested by Carl Ferguson (USFWS) was successful. A piece of tarp (1 m x 0.5 m) was attached to the left side of the catch box. When the catch box is attached to a trap, a bungee cord holds the tarp flap extended. This creates a funnel around the catch box entrance and expedites removal of captured ducks.

On 18 August a scheduled crew-change, grain haul, and camp resupply was accomplished with a floatplane. Upon landing at Willow Lake the floats touched lake bottom without causing any damages or harm. PB and DW returned to Tulita and were replaced by PH and MM to work with JB. Glen Guthrie, Communications Officer (SRRB) interviewed the crew and took pictures for articles in the Summer 2006 edition of the SRRB's quarterly newsletter and for a feature article on the project that appeared in the NWT's only territory-wide newspaper *News North* in its 9 October 2006 edition.

Due to an unprecedented large catch of northern pintails, the station's supply of size 6 bands became critically low. Jim Wortham (USFWS, Laurel, MD) promptly forwarded bands from Saskatchewan that arrived in Norman Wells on 22 August. The bands were quickly delivered on 23 August to Willow Lake by helicopter charter. We were very fortunate to get this charter because this was the only aircraft available in the entire Sahtu during this week due to the high level of exploration activity for minerals and hydrocarbons throughout the region.

Comment [JB3]: Laurel, MD

The creek channel between Cache Point and the banding camp was marked with poles to delineate a safe landing zone for a floatplane. All supplies at the station were inventoried and stored in the silo for next year. Traps were removed from the trap sites by 30 August and stored at Cache Point. On 31 August, camp was closed and a *Plateus Porter* flew the crew to Tulita and Norman Wells.

Daily communications were maintained between the banding crew and ENR in Norman Wells and the TRRC office, by Forest Management's radio system and single-side-band radio. *Global*

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Star satellite phone service was sporadic and unreliable this year across the NWT, including Willow Lake. Generator-produced electricity at camp is essential for computer data entry and to run a freezer for food storage. ENR and SRRB policies do not allow crew members to hunt while they are working on projects. During August the banding crew were the only people present at Willow Lake despite the fact that Willow Lake is an important area for subsistence hunting and fishing by Dene and Métis from Tulita.

All garbage was removed from site and taken for disposal at the Norman Wells landfill. Near the end of August, a black bear (*Ursus americanus*) walked through the electric fence and ate some food in the camp freezer. Fortunately it did not return before camp was closed. A bear-wise adjustment to the layout of camp tent frames and a new kitchen area will reduce potential bear/people conflicts in future. A pack of timber wolves (*Canis lupus*) visited the Willow Point without causing any problems. Mink (*Mustela vison*) did not cause any predation mortality on trapped ducks at the trap site.

Willow Lake's water level allowed boat access to the preferred trap site at Willow Point. The banding crew traveled in a 5.5 m (18 ft) flat-bottomed boat with a 16 hp *Go-Devil* motor. A 9.9 hp outboard motor for the 3.4 m (12 ft) *Lund* was not available this year. This boat and motor are usually used to obtain drinking water from the first tributary creek downriver from camp. This year's drinking water was flown into camp from Norman Wells.

Most of the traps cached at Willow Lake at the end of the 2005 banding season were in good condition. Nineteen traps were set up by 8 August at Willow Point. Some new 2"-thick high-density Styrofoam floaters replaced worn-out floaters. Last year we noted that traps positioned with the throat towards shore had less weed build up in the funnel during windy conditions and caught more ducks than did those traps facing the lake. Therefore, this year all traps had their throats facing shore. Traps had to be constantly moved after mid-August as the water level continuously dropped. Relocating traps required cutting openings in horsetail (*Equisetum spp.*) mats. Twenty-five new trap panels are stored in Norman Wells for trap replacement and repairs next year.

The project's boats, motors, carousel, floaters, camping equipment, bait (3000 lb of barley), and supplies are stored inside the grain silo at the banding camp for next year. All traps are folded and piled in the bush at the east side of the Willow Lake outlet at Cache Point.

RESULTS:

High water levels allowed boat access throughout August to the preferred trap site at Willow Point. From 9-30 August we live-captured and banded 2083 dabbling ducks and replaced bands on two ducks with worn-out bands. This is the second highest number of ducks banded at Willow Lake since 1995; the record catch was 2168 in 2002. Traps were set for 408 trap-nights (TN) resulting in a catch of 5.1 ducks per TN; that is greater than our 12-year average trapping

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success of 4.4 ducks per trap night.

Prebaiting with barley at Willow Point attracted ducks to the banding site prior to trapping and likely contributed to early trapping success. A total of 70 bags (1750 kg) of clean, germ-free barley was used for bait. The first duck was caught on 9 August followed by consistently high numbers of ducks banded daily from 11 to 30 August (Table 1). The highest daily total of 179 ducks banded occurred on 15 August and over one hundred ducks were banded on thirteen days.

Consistent daily trapping success was achieved with 50% of the total number of ducks banded by 19 August. Most mallards were banded during the latter half of August. Many mallards and northern pintails were still using the trap sites on 31 August when the traps were removed.

This was a 'banner year' for banding northern pintails. Seventy-four percent of all ducks banded were northern pintails ($N = 1007$) and mallards ($N = 535$, Table 1). This year's total capture of 2083 ducks banded is 1.5 times greater than our 12-yr average of 1413 ducks banded (Table 2). This is likely a result of good waterfowl production, favorable environmental conditions for banding (e.g., water levels allowing access to Willow Point and ducks arriving with passage of weather fronts), and a consistent high level of trapping effort by the banding crew.

The number and variety of incidentally caught species is low (Table 3), with the exception of an increasing number of American wigeon (*A. americana*). The number of American wigeon banded increased substantially to 418 this year and represents 20% of our banding total. The 114 American green-winged teal (*A. crecca*) banded this year is below the species 12-yr average of 142. Other incidentally captured ducks included: four blue-winged teals (*A. discors*), three northern shovelers (*A. clypeata*), one gadwall (*A. strepera*), and one American black duck (*A. rubripes*). The latter is the first American black duck ever banded at Willow Lake.

Seventy-one ducks banded previously at other banding stations or at Willow Lake were recaptured and released. Remarkably, one of these recaptured banded ducks was a mallard banded at Willow Lake ten years ago. The crew also recaptured and released 1402 ducks banded locally in 2006. As many as 135 of these "trap happy" ducks were handled in a day.

There were four mortalities of captured ducks due to handling technique. A pack of wolves (*Canis lupus*) were present throughout the month leaving tracks near some traps. No other predators were present at the trap site.

A total of 16,956 ducks from 11 different species and 2 hybrids have been live-captured and banded at Loche and Willow Lakes from 1995 to 2006 (Table 3). We have observed considerable annual variation in capture data by species composition, sex ratio, total number, and age-class (Tables 4 & 5). Mallards and northern pintails have accounted for 49% and 29%, respectively, of all birds banded (Table 3), followed by American wigeon (11%) and American green-winged teal (10%).

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Table 1. Daily number of ducks banded during August 2006 at Willow Lake, NWT

Date	Northern Pintail	Mallard	American Wigeon	Green-winged Teal	Other Species	Total
9	1	2	9			12
10	2	4	13			19
11	16	8	28	7	1	60
12	39	20	32	7	2	100
13	38	3	57	19		117
14	41	14	34	12		101
15	104	7	49	18	1	179
16	61	41	29	6	1	138
17	61	35	22	3	1	122
18	52	32	11	15	1	111
19	43	25	10			78
20	23	13	16	2		54
21	43	19	8	2	2	74
22	56	27	17	1		101
23	73	34	20	2		129
24	22	24	18			64
25	77	39	15	6		137
26	63	27	8	9		107
27	35	61	7			103
28	52	39	2	4		97
29	65	45	10			120
30	40	16	3	1		60
Total	1007	535	418	114	9	2083

Other species include: blue-winged teal (4), northern shoveler (3), American black duck (1), and gadwall (1).

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Table 2. Band return rate for ducks banded during 1995 to 2005 at Willow Lake, NWT

Year	Number of Ducks Banded	Number of Bands Returned	Band Return Rate (%)
1995	509	61	12.0
1996	1892	228	12.1
1997	1687	158	9.4
1998	1700	278	16.4
1999	1248	261	20.9*
2000	1600	271	16.9
2001	404	54	13.3
2002	2168	196	9.0
2003	1348	131	9.7
2004	1298	105	8.1
2005	1019	63	6.2
2006	2083		
Total	16,956	1806	
Mean	1413		12.2

* US\$100 reward offered for specially marked bands

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Table 3. Cumulative duck banding statistics at Willow Lake, NWT, 1995-2006

Species	Number Banded			Total N (%)	Band Return Rate (%)
	Local	Hatch-year	After Hatch-year		
Mallard	91	1258	6902	8251 (49%)	17.0
Northern pintail	6	2376	2608	4990 (29%)	4.6
American wigeon	122	700	1044	1866 (11%)	8.9
American green-winged teal	27	1037	634	1698 (10%)	5.0
Blue-winged teal	0	18	97	115	1.7
Northern shoveler	2	10	4	16	
Lesser scaup	5	2	1	8	
Gadwall	0	0	5	5	
Redhead	0	0	1	1	
Greater scaup	0	0	1	1	
American black duck	0	0	3	3	
Mallard - black duck hybrid	0	0	1	1	
Mallard - northern pintail hybrid	0	0	1	1	
Total	253 (1%)	5401 (32%)	11,302 (67%)	16,956	12.2

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Table 4. Annual duck banding totals by age-class at Willow Lake, NWT: 1995-2006.

Year	Juvenile		Adult		Total
	N	%	N	%	
1995	350	69	159	31	509
1996	227	12	1665	88	1892
1997	1050	62	638	38	1687
1998	535	31	1165	69	1700
1999	90	7	1158	93	1248
2000	42	3	1558	97	1600
2001	48	12	356	88	404
2002	799	37	1369	63	2168
2003	846	63	502	37	1348
2004	196	15	1102	85	1298
2005	703	69	316	31	1019
2006	796	38	1287	62	2083
Total	5682		11,275		16,956
Mean	474	34	940	66	1413

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Table 5. Annual banding totals by species and age-class at Willow Lake, NWT, 1995-2006

Year	Mallard		Northern Pintail		Other Species	
	% Juvenile	% Adults	% Juvenile	% Adults	% Juvenile	% Adults
1995	68	32	95	5	50	50
1996	<1	99	27	72	67	33
1997	19	81	75	25	76	24
1998	21	79	55	45	53	47
1999	3	97	60	40	72	28
2000	<1	99	29	71	35	66
2001	6	94	91	9	53	47
2002	15	85	50	50	38	62
2003	51	49	67	33	66	34
2004	8	92	25	75	10	90
2005	85	15	68	32	52	48
2006	34	66	36	64	46	54
Mean	26	74	57	43	52	48

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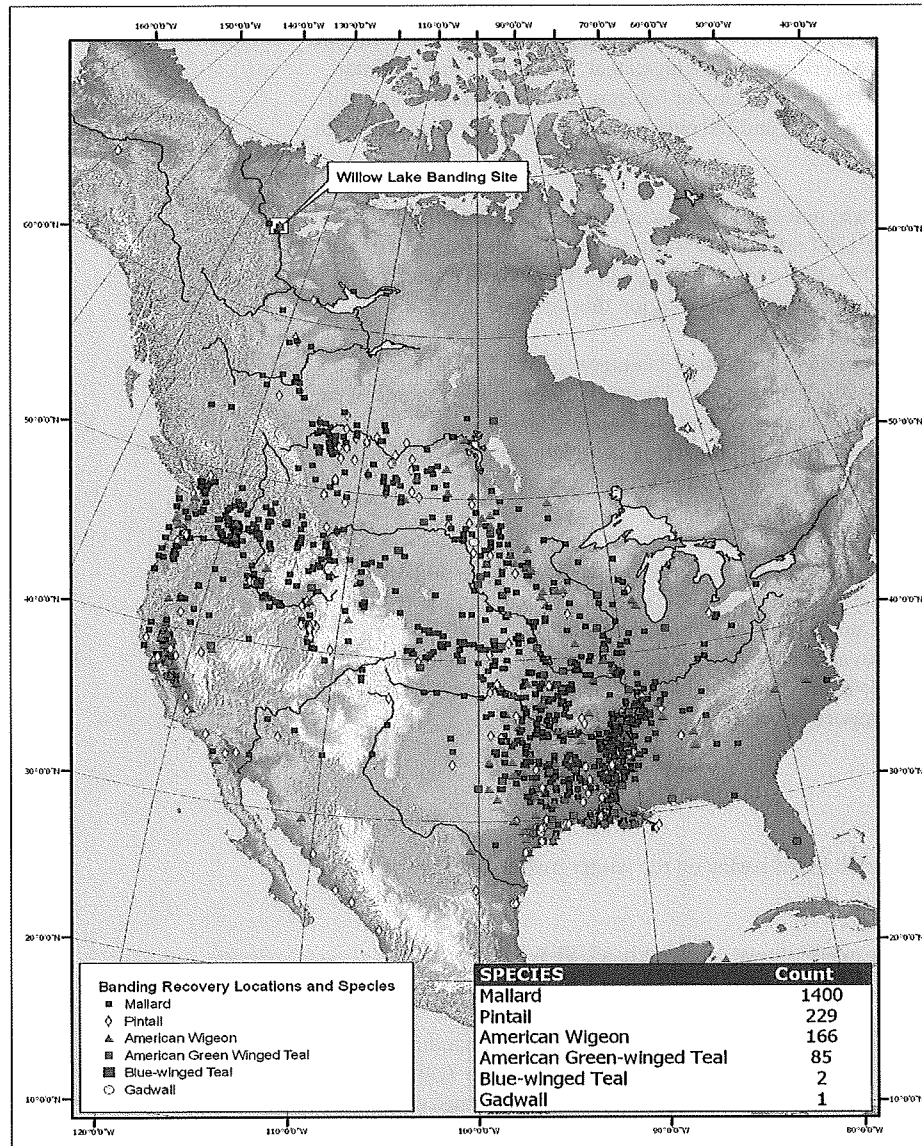


Figure 2. Distribution of band returns from ducks banded at Loche and Willow Lakes, NWT: 1995-2006

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Approximately 12.2% of all bands deployed at Willow Lake since 1995 have been recovered (Table 3). Band return rates vary considerably by species. Our best rate of return is for mallard (17%), followed by American wigeon, American green-winged teal, and then northern pintail. Other variables affecting rates of band return related to our banding activity include the use of Reward bands placed on some mallards in 1999 and the current use of leg bands inscribed with Call 1-800-327- BAND (2263).

The age ratio of banded ducks in 2006 was one-third juvenile aged ducks for both mallards and northern pintails (Table 5). There were 1287 adult and 796 juvenile (38%) ducks banded this year (Table 4). This is similar to the 1995-2006-station average of 34% juvenile-age-class indicating average production by breeding dabblers in the region this year.

Data were entered at camp on laptop computer using *Band Manager* software (USFWS, Canadian Wildlife Service (CWS), Bird Studies Canada). Completed *Banding Schedules* were promptly received by electronic mail in good order at the Bird Banding Office (CWS, Hull, PQ) for opening day of the duck-hunting season (01 September). A complete set of banding data 1995 -2006 and band returns for the station is maintained at ENR, Norman Wells.

The Willow Lake duck-banding site has demonstrated it can meet the banding objectives for mallards, and occasionally for northern pintails, as part of the United States/Canada *Waterfowl Banding Program*. The project continues to be a model of co-operation between the federal governments of the United States and Canada, the Government of the NWT, a wildlife co-management board, a non-profit non-government organization, and a small aboriginal community. The TRRC, SRRB, and ENR are committed to continuing this project on a long-term basis in conjunction with other supportive organizations and the USFWS.

RECOMMENDATIONS:

1. Purchase and deliver 1359 kg (3000 lb) of barley on the winter road to Norman Wells during Jan-Feb 2007.
2. It is essential to continue to have one biologist, preferably a USFWS Waterfowl Biologist, at Willow Lake throughout the entire August banding season.
3. Three people are required on-site throughout the project. A two-person banding crew selected by the TRRC, SRRB, and ENR should assist the biologist. Both Tulita crewmembers should be experienced banding assistants and be offered employment for the full month of August in 2007.
4. Delay trap removal from 30 August to 31 August and delay camp closure and crew removal from August 31 to September 1. This will maximize the opportunity to catch late

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arriving ducks prior to the start of hunting season (September 1).

5. Concentrate all traps at Willow Point. If Willow Point is not accessible by boat, then trap at Cache Point.

4.6. Place trap openings towards shore to prevent weed accumulation in the trap's funnel.

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5.7. Continue trap replacement with two new B-2 traps per year.

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8. Purchase lumber for a screened kitchen / dining area, 12-volt battery charger, high-density Styrofoam floaters, filters for all motors, 8 ½ inch black cable ties, Nitrile coated work gloves, paint for the tent frames, hog rings, one 100 ft. roll of 1" x 2" wire mesh, and a replacement canvas prospector tent (12 x 16 x 4 ft).

4.9. Before August 2007, inspect the camp, check inventory, and deliver lumber and grain by floatplane during high water levels from spring run-off.

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10. To make the camp more "bear wise" move the biologist's tent frame away from the river and parallel to the crew tent frame. Build a kitchen to one side of the tents within the area enclosed by the electric bear fence.

11. Prebait Willow Point trap site about 25 July with four bags (100 kg) of barley.

ACKNOWLEDGEMENTS:

We particularly thank the Board of Directors and Wilfred Lennie (President) of the TRRC for their continuing long-term commitment to this project. We thank contract crewmembers Peter Horassi and Paul Bernarde for their assistance banding ducks in the field.

The SRRB (Walter Bayha, Chairperson & Jody Snortland, Executive Director) provided the funding and opportunity for Derek Widow and Mathew Menacho to participate in the project as assistants. Their participation in the bush is appreciated.

Pilots with North Wright Airways Ltd. and Canadian Helicopters Ltd. capably and safely delivered supplies, equipment, and personnel to and from the Willow Lake camp.

Steve Hannah, (ENR Sahtu Region Superintendent, Norman Wells) authorized use of departmental resources and the assistance of the following staff: Tim Melnyk (Warehouse Stores person) loaned equipment; Paul Rivard (Manager, Forest Management) authorized helicopter assistance and did pre-baiting; Nekita Lloyd and Dolly Whiteman (Fire Clerks) maintained daily radio checks with the crew.

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Sam Kivi (Manager, Corporate Services, Shared Services Centre, Norman Wells) provided administrative and financial accountability. Funding and logistical support were provided by the USFWS, SRRB, Ducks Unlimited Canada, and ENR. Jim Wortham (Chief Migratory Bird Surveys, USFWS, Laurel, MD) assisted with project planning. Ducks Unlimited's financial support for the project this year was particularly timely and appreciated.

James Auld (GIS Specialist, Sahtu GIS Project, Norman Wells) produced Figures 1 and 2.

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**UNITED STATES/CANADA COOPERATIVE WATERFOWL BANDING REPORT,
WILLOW LAKE, MACKENZIE RIVER VALLEY, NORTHWEST TERRITORIES,
AUGUST 2007**

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ABSTRACT:

In 2007, the Tulita Renewable Resources Council (TRRC), the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR), and the United States Fish and Wildlife Service (USFWS) collaborated in the 13th consecutive year (1995-2007) of duck banding at Willow Lake (65°14' N; 125°25' W) in the Mackenzie River Valley, Sahtu Settlement Area, NWT. Our annual goal is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to the opening day of duck hunting in the NWT (01 September). The USFWS, Sahtu Renewable Resources Board (SRRB), and ENR provided funding for the project. A Waterfowl Biologist (USFWS) supervised one contract Banding Assistant (TRRC) and two crewmembers hired by the SRRB and ENR. A maximum of 18 funnel traps were set for a total of 324 trap-nights during 12 to 30 August. Trap success was 1.2 ducks per trap night with two trap-related mortalities. A total of 1822 kg (4022 lb) of barley was used as bait. Standard leg bands (Call 1-800-327-BAND) were placed on 374 ducks: 255 northern pintails (68% of all ducks banded), 48 mallards (13%), 35 American wigeons (*A. americana*; 9%), 35 American green-winged teals (*A. crecca*; 9%) and one blue-winged teal (*A. discors*). The number of ducks banded in 2007 was below our 13-year average of 1333 ducks. Our greatest daily catch occurred on August 15 with 125 ducks banded. Willow Lake water levels were the lowest ever. Bald eagles (*Haliaeetus leucocephalus*) at the trap-site interfered with trapping success. Fifty-six percent of banded ducks (N = 210) were in the hatch-year or local age-class, which is greater than the 1995-2007-station average of 34% juvenile age class. Water levels were not suitable for float-equipped aircraft to land at the banding station during August. Willow Lake water levels were so low that all traps were set at the only accessible site - Cache Point. Three ducks banded at other banding stations or banded at Willow Lake several years ago were recaptured and released.

BACKGROUND:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area of the Northwest Territories (NWT), sometimes support dense summer populations of molting, non-breeding adult ducks, particularly when drought conditions occur in more southern breeding areas. In some years there is excellent hatching success and productivity.

Since 1995, the United States Fish and Wildlife Service (USFWS) have collaborated with the Tulita Renewable Resources Council (TRRC) and the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR) to band ducks within the Sahtu. The annual goal of the project is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to 01 September, which is the opening day of the duck-hunting season in the NWT.

The project was initially established at Loche Lake northeast of Tulita in 1995 (Popko et al. 1995; Figure 1); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 the banding station was moved to the nearby and larger Willow Lake (65°14' N; 125°25' W) where it has since remained (Popko et al. 1997, 1998, 2002, 2003, 2004, 2005, 2006; Bidwell et al. 1999, 2000, 2001). In 2002, the banding project camp and trap-site locations were moved from the inlet of Willow Lake to the better sandy substrate area found near the outlet of Willow Lake (Figure 1).

Willow Lake lies within the selected (i.e., private) lands of the Sahtu Dene and Métis under the terms of the Sahtu Dene and Métis Comprehensive Land Claim Agreement (Dept. of Indian and Northern Affairs Canada, 1993). The Tulita Lands Corporation is responsible for approving terms of access to private lands within the Tulita District, including the Willow Lake watershed.

Further, the land claim gives the TRRC responsibility for involvement in, and approval of, wildlife research and management projects in and near their community. Therefore, we obtained permission to enter these private lands, and to construct and occupy the project's base camp, from the Tulita Lands Corporation with the support of the TRRC. The Willow Lake banding project camp now consists of two tent frames, kitchen, and a grain storage silo. The silo provides storage for bait, food, and supplies, which reduces transportation costs.

The Willow Lake area has been proposed as a Conservation Zone in the draft Sahtu Land Use Plan (Sahtu Land Use Planning Board 2007). Further, the lake and the extensive wetland complex along the Brackett River south to the Great Bear River have been proposed as an Area of Interest under the NWT Protected Area Strategy through the Tulita Conservation Initiative. These proposed designations would prohibit non-renewable resource development and protect these critical waterfowl wetlands.

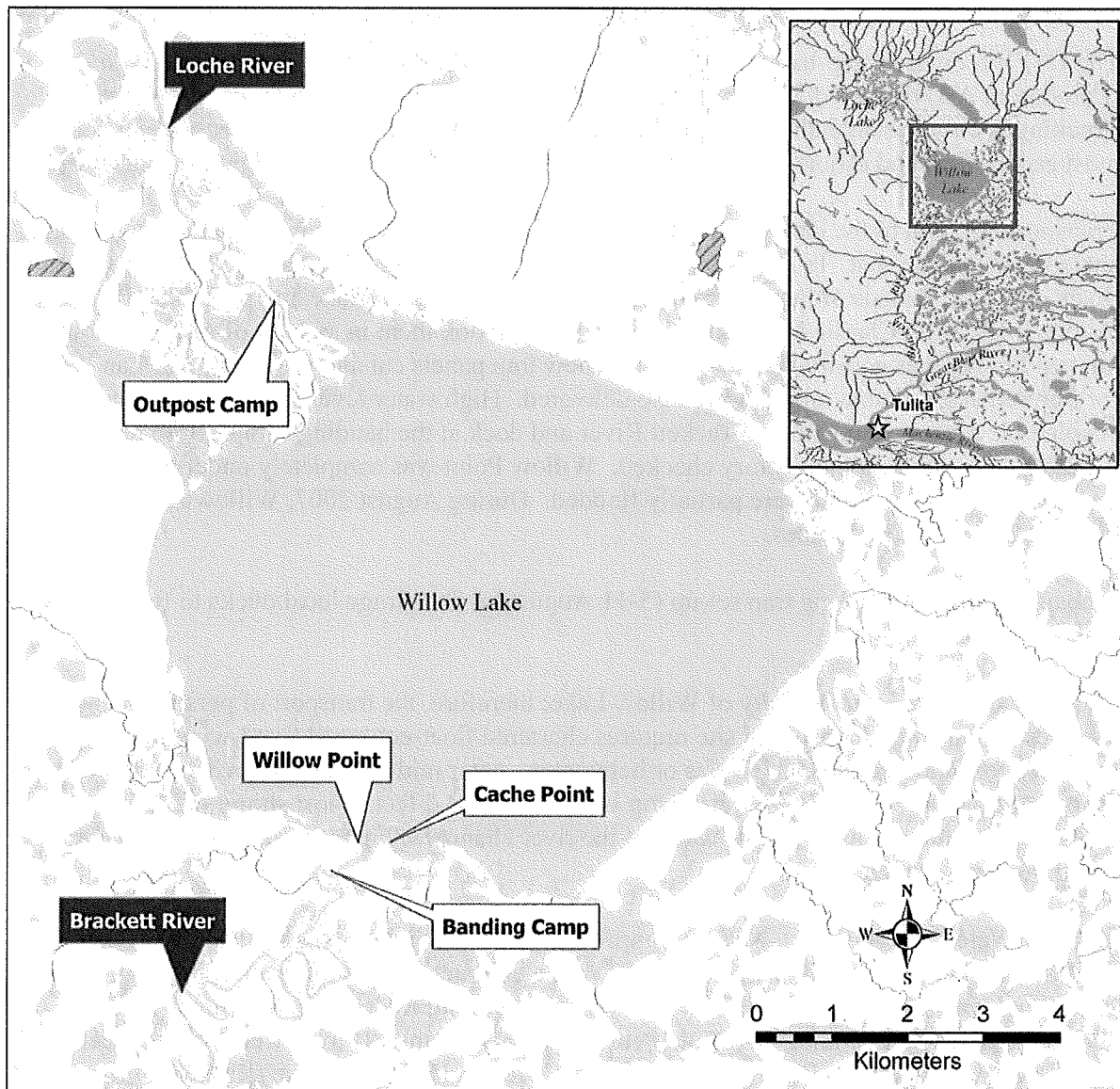


Figure 1. Willow Lake duck banding camp, Tulita District, Northwest Territories.

NARRATIVE:

The USFWS ordered trap-bait barley from Alberta in fall 2006. *Northwest Transport Ltd.*, (Edmonton, AB) delivered 2265 kg (5000 lb) of barley to Norman Wells in February 2007. Trucking is only possible during the mid-January to mid-March winter road season and is the most economical and efficient method of transporting grain to the Sahtu Region for this project.

Transporting grain to the banding station by floatplane during spring runoff ensures bait is on-site at a reasonable cost. In mid July, *North-Wright Airways Ltd's* Fairchild *Plateaus Porter* on floats delivered 3 loads of lumber from Norman Wells to Willow Lake and picked up Paul Bernarde (PB) and Charlie McCauley from Tulita and took them in and out of camp. A framed kitchen facility was constructed. Twenty-five new trap panels cut and ground in Norman Wells for trap replacement and repairs were also delivered. High water levels from spring runoff enabled the plane to land on the Brackett River and dock at the banding camp. Both tent frames were cleaned and station inventory checked. Willow Point was completely underwater and the traps stored at Cache Point were partially flooded. During August 2007, Willow Lake had the lowest water levels in decades.

Prebaiting continued during trap set-up (5-11 August) to encourage local ducks to feed on barley at the trap site.

There are no roads in the vicinity of Willow Lake; therefore, the transport of personnel and supplies to and from the banding site requires chartered float-equipped fixed-wing aircraft with short take-off and landing capabilities or helicopter. After mid July, water levels continued to drop significantly. One inch of water drop is equivalent to 6 feet of lost shoreline. This required constant relocating traps to deeper water in the river channel. Weather was generally warmer and dryer than average.

USFWS Waterfowl Biologist, Nathan Zimpfer (NZ) arrived in Norman Wells on 01 August to finalize supplies arranged by RP. The TRRC has a contract for this project arranged by ENR using funds provided by the USFWS. The TRRC and Sahtu Renewable Resources Board (SRRB) hired senior banding assistants Peter Horassi (PH) and PB for 2 weeks and 4 weeks respectively. In addition, David Menacho (TRRC) replaced Karla Lennie (ENR summer student) for 2 weeks each. Both crews did an excellent job and worked well with Waterfowl Biologist NZ. Both Banding Assistants had prior duck banding experience at the project site. Banding training was provided to KL and DM by NZ. The necessity for cleanliness was stressed as a precaution against possible disease or parasite transmission. Since 1995, a total of 23 people from Tulita – all Sahtu Dene and Metis - have received duck banding orientation and on-site training.

On 3 August, two trips with an A *Star* helicopter (Canadian Helicopters, Norman Wells, NT) from Norman Wells to Willow Lake delivered NZ, food, and camp supplies. The first crew of banding assistants, PB and PH, were picked up in Tulita and flown to Willow Lake. Camp was resupplied with perishable foods and supplies on 7 August by helicopter.

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On 16 August a scheduled crew-change, grain haul, and camp resupply was accomplished with a Bell 206 *Sahtu Helicopter*. PH and KL returned to Tulita and Norman Wells and were replaced by David Menacho to work with NZ and PB.

On 27 and 28 August, *Forest Management* (ENR) delivered 5000lb of barley with their contract *A Star* (Canadian *Helicopters*, Norman Wells). Bait was stored in the silo.

The creek channel between Cache Point and the banding camp was the only navigatable water upstream. There was no access into Willow Lake that dried up into pools and mud flats. All supplies at the station were inventoried and stored in the silo for next year. Traps were removed from the trap sites by 30 August and stored at Cache Point. Camp was closed, and a helicopter flew the crew to Tulita and Norman Wells.

Daily communications were maintained between the banding crew and ENR in Norman Wells, by Forest Management's radio system. *Global Star* satellite phone service was sporadic and unreliable this year across the NWT, including Willow Lake. Generator-produced electricity at camp is essential for computer data entry and to run a freezer for food storage. ENR and SRRB policies do not allow crew members to hunt while they are working on projects. During August the banding crew were the only people present at Willow Lake.

All garbage was burnt, removed from site and taken for disposal at the Norman Wells landfill. Near the end of August, a black bear (*Ursus americanus*) and a pack of timber wolves (*Canis lupus*) visited the Willow Point without causing any problems. Mink (*Mustela vison*) were observed at camp but they did not cause any predation mortality on trapped ducks at the trap site. A small flock of sandhill cranes (*Grus canadensis*) fed on barley at the trap site. Three bald eagles (*Haliaeetus leucocephalus*) regularly perched in trees at the trap site. Despite efforts to deter them, they persistently returned and harassed incoming ducks.

Willow Lake's extremely low water level did not allow boat access to the preferred trap site at Willow Point. The banding crew traveled between camp and Cache Point trap site in a 5.5 m (18 ft) flat-bottomed boat with a 16 hp *Go-Devil* motor and a 9.9 hp outboard motor for the 3.4 m (12 ft) *Lund*. Obtaining limited amounts of drinking water from tributary creeks downriver from camp was challenging.

Most of the traps cached at Willow Lake at the end of the 2006 banding season were in good condition. Eighteen traps were set up by 6 August at Cache Point. Most traps had their throats facing shore to prevent weeds from plugging the trap entrance. Traps had to be constantly moved as the water level dropped daily.

The project's boats, motors, carousel, floaters, camping equipment, bait (8000 lb of barley), and supplies are stored inside the grain silo at the banding camp for next year. All traps are folded and piled in the bush at the east side of the Willow Lake outlet at Cache Point.

RESULTS:

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Low water levels prevented boat access to the preferred trap site at Willow Point. From 12-30 August we live-captured and banded 374 dabbling ducks. This is the lowest number of ducks banded at Willow Lake since 1995. Traps were set for 324 trap-nights (TN), resulting in a catch of 1.2 ducks per TN; that is less than our 13-year average trapping success of 3.8 ducks per trap night (Table 1).

A total of 1822 kg (4022 lb) clean, germ-free barley was used for bait. The first duck was caught on 13 August followed by consistently low numbers of ducks banded daily to 30 August (Table 2). The highest daily total of 125 ducks banded occurred on 15 August before the eagles arrived. Many northern pintails were still using the trap sites on 31 August when the traps were removed.

This was a production year for ducks banded at Willow Lake. Sixty-eight percent of all ducks banded were northern pintails (N = 255) and mallards (N = 48, Table 1). This year's total capture of 374 ducks banded about a third of our 13-yr average of 1,333 ducks banded (Table 3). This is likely a result of extreme low water level preventing access to better trap sites at Willow Point and disturbance by the presence of bald eagles at the trap site.

The number and variety of incidentally caught species is low (Table 4), with the exception of an increasing number of American wigeon (*A. americana*). The number of American wigeon banded dropped to 35 from last year's record catch of 418. The 35 American green-winged teal (*A. crecca*) banded this year is below the species 13-yr average of 133. One blue-winged teal (*A. discors*) was the only other incidentally captured duck.

Three ducks banded previously at Willow Lake were recaptured and released. The crew also recaptured and released 59 ducks banded locally in 2007; compared to 3,012 ducks recaptured and released in 2006.

There were two mortalities of captured ducks during banding operations. The first mortality, a male northern pintail died from predation while in a trap. The second mortality, also a male northern pintail captured in the same trap, died later likely from stress associated with the incident. A pack of wolves (*Canis lupus*) were present throughout the month leaving tracks near some traps. Three bald eagles (*Haliaeetus leucocephalus*) at the trap site during most of August probably deterred many ducks from entering the traps.

A total of 17,330 ducks from 11 different species and 2 hybrids have been live-captured and banded at Loche and Willow Lakes from 1995 to 2007 (Table 4). We have observed considerable annual variation in capture data by species composition, sex ratio, total number, and age-class (Tables 5&6). Mallards and northern pintails have accounted for 48% and 30%, respectively, of all birds banded (Table 4), followed by American wigeon (11%) and American green-winged teal (10%).

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Table 1. Trapping success duck banding at Willow Lake, NWT, 1995 to 2007.

Year	Barley (Lb)	Dates Trapped August	Maximum Number of Traps	Trap Nights (TN)	Number of Ducks Banded	Trapping Success (Ducks / TN)
1995	1500	2 to 21	7	119	509	4.3
1996	4500	9 to 30	17	195	1892	9.7
1997	3500	8 to 29	14	291	1687	5.8
1998	4000	13 to 30	16	262	1700	6.5
1999	5620	3 to 31	16	439	1248	2.8
2000	4463	3 to 30	18	490	1600	3.3
2001	3940	4 to 30	18	451	404	0.9
2002	6100	5 to 29	18	416	2168	5.2
2003	5061	6 to 30	18	423	1348	3.2
2004	4022	9 to 30	20	470	1298	2.8
2005	3030	8 to 30	13	293	1019	3.5
2006	3856	8 to 30	19	408	2083	5.1
2007	4022	12 to 30	18	324	374	1.2
Mean	4124	2 to 31	16	352	1333	3.8

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Table 2. Daily number of ducks banded during August 2007 at Willow Lake, NWT

Date	Northern Pintail	Mallard	American Wigeon	Green-winged Teal	Other Species	Total
13	1					1
14						0
15	65	11	31	18		125
16	5	2	2	2		11
17	35			1		36
18	3	2		2		7
19						0
20	2			1		3
21	3	6				9
22						0
23						0
24	5			1		6
25	27	2	1			30
26	3	3				6
27	40	2	1	3	1	47
28	30	6		4		40
29	14	6				20
30	22	8		3		33
Total	255	48	35	35	1	374

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Table 3. Band return rate for ducks banded during 1995 to 2006 at Willow Lake, NWT

Year	Number of Ducks Banded	Number of Bands Returned	Band Return Rate (%)
1995	509	62	12.2
1996	1892	236	12.5
1997	1687	163	9.7
1998	1700	290	17.1
1999	1248	279	22.4*
2000	1600	287	17.9
2001	404	58	14.4
2002	2168	219	10.1
2003	1348	163	12.1
2004	1298	141	10.9
2005	1019	144	14.1
2006	2083	128	6.1
2007	374	0	
Total	17,330	2170	
Mean	1333		12.8

* US\$100 reward offered for specially marked bands

Table 4. Cumulative duck banding statistics at Willow Lake, NWT, 1995-2007

Species	Number Banded			Total N (%)	Band Return Rate (%)
	Local	Hatch-year	After Hatch-year		
Mallard	93	1287	6919	8299 (48 %)	18
Northern pintail	6	2509	2730	5245 (30 %)	6
American wigeon	122	718	1061	1901 (11 %)	12
American green-winged teal	27	1064	642	1733 (10 %)	6
Blue-winged teal	0	19	97	116 (1 %)	1
Northern shoveler	2	10	4	16	
Lesser scaup	5	2	1	8	
Gadwall	0	0	5	5	
Redhead	0	0	1	1	
Greater scaup	0	0	1	1	
American black duck	0	0	3	3	
Mallard - black duck hybrid	0	0	1	1	
Mallard - northern pintail hybrid	0	0	1	1	
Total	255	5609	11,466		12.8

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Table 5. Annual duck banding totals by age-class at Willow Lake, NWT: 1995-2006.

Year	Juvenile		Adult		Total
	N	%	N	%	
1995	350	69	159	31	509
1996	227	12	1665	88	1892
1997	1050	62	638	38	1687
1998	535	31	1165	69	1700
1999	90	7	1158	93	1248
2000	42	3	1558	97	1600
2001	48	12	356	88	404
2002	799	37	1369	63	2168
2003	846	63	502	37	1348
2004	196	15	1102	85	1298
2005	703	69	316	31	1019
2006	796	38	1287	62	2083
2007	210	56	164	44	374
Total	5892		11,439		17,330
Mean	453	34	880	66	1330

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Table 6. Annual banding totals by species and age-class at Willow Lake, NWT, 1995-2007

Year	Mallard		Northern Pintail		Other Species	
	% Juvenile	% Adults	% Juvenile	% Adults	% Juvenile	% Adults
1995	68	32	95	5	50	50
1996	<1	99	27	72	67	33
1997	19	81	75	25	76	24
1998	21	79	55	45	53	47
1999	3	97	60	40	72	28
2000	<1	99	29	71	35	66
2001	6	94	91	9	53	47
2002	15	85	50	50	38	62
2003	51	49	67	33	66	34
2004	8	92	25	75	10	90
2005	85	15	68	32	52	48
2006	34	66	36	64	46	54
2007	65	35	52	48	65	35
Mean	29	71	56	44	53	47

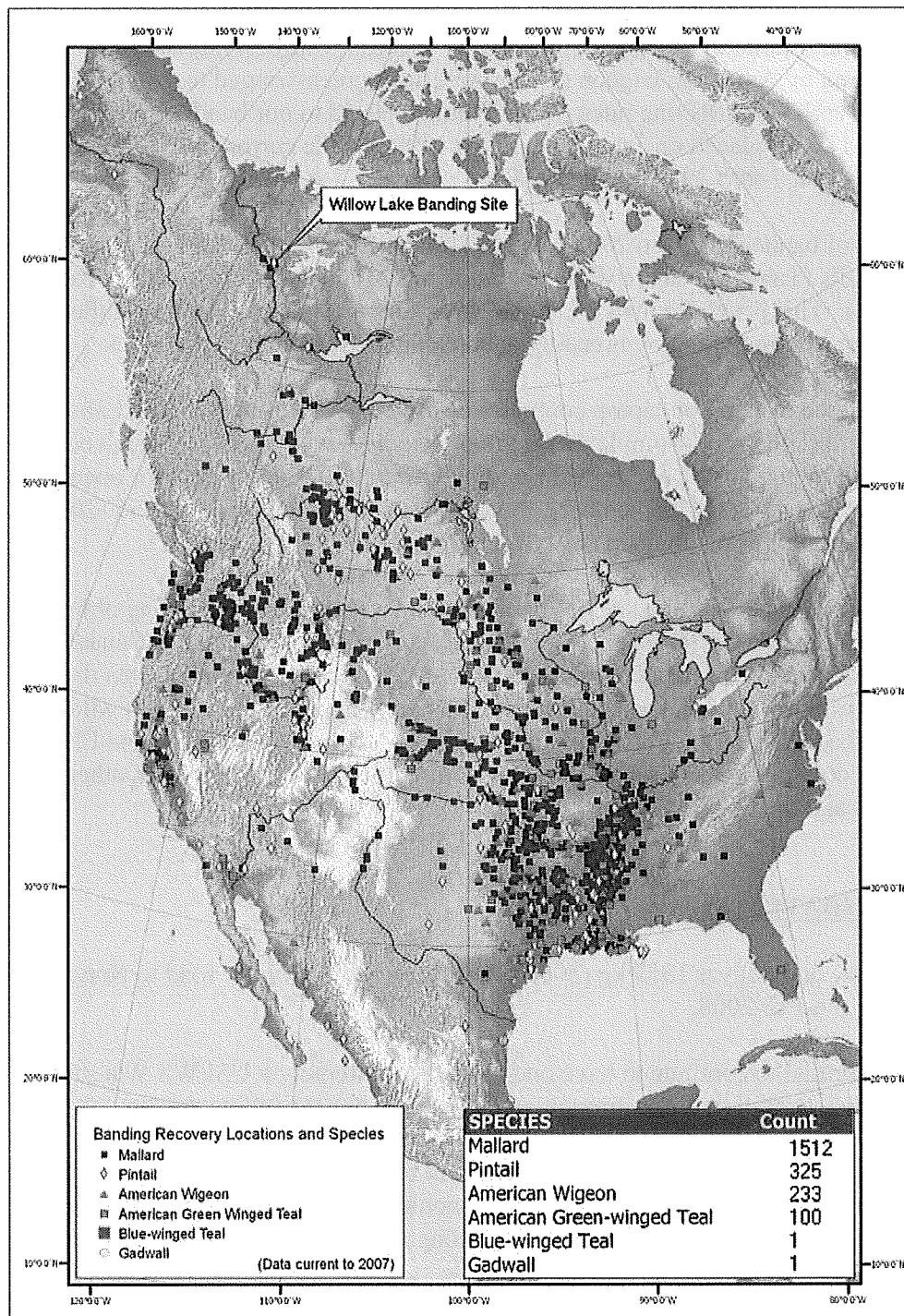


Figure 2. Distribution of band returns from ducks banded at Loche and Willow Lakes, NWT: 1995-2007.

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Approximately 13% of all bands deployed at Willow Lake since 1995 have been recovered (Table 3). Band return rates vary considerably by species. Our best rate of return is for mallard (18%), followed by American wigeon (12%), American green-winged teal, and then northern pintail. Other variables affecting rates of band return related to our banding activity include the use of Reward bands placed on some mallards in 1999 and the current use of leg bands inscribed with Call 1-800-327- BAND (2263).

The age ratio of banded ducks in 2007 was 65% juvenile aged ducks for mallards and 52% for northern pintails (Table 5). There were 164 adult and 210 juvenile (56%) ducks banded this year (Table 4). This is greater than the 1995-2006-station average of 34% juvenile-age-class indicating average production by breeding dabblers in the region this year.

Data were entered at camp on laptop computer using the USGS Bird Banding Laboratory's *Bandit* software (USFWS). Completed *Banding Schedules* were promptly received by electronic mail in good order at the Bird Banding Office (CWS, Hull, PQ) for opening day of the duck-hunting season (01 September). A complete set of banding data 1995 -2007 and band returns for the station is maintained at ENR, Norman Wells.

The Willow Lake duck-banding site has demonstrated it can meet the banding objectives for mallards, and occasionally for northern pintails, as part of the United States/Canada *Waterfowl Banding Program*. The project continues to be a model of cooperation between the federal governments of the United States and Canada, the Government of the NWT, a wildlife co-management board, and a small aboriginal community. The TRRC, SRRB, and ENR are committed to continuing this project on a long-term basis in conjunction with other supportive organizations and the USFWS.

RECOMMENDATIONS:

1. Purchase and deliver 1359 kg (3000 lb) of barley on the winter road to Norman Wells during Jan-Feb 2008.
2. It is essential to continue to have one biologist, preferably a USFWS Waterfowl Biologist, at Willow Lake throughout the entire August banding season.
3. Three people are required on-site throughout the project. A two-person banding crew selected by the TRRC, SRRB, and ENR should assist the biologist. Both Tulita crewmembers should be experienced banding assistants and be offered employment for 3 to 31 August in 2008.
4. Concentrate all traps at Willow Point. If Willow Point is not accessible by boat, then trap at Cache Point.
5. Construct and deploy two floating traps for concurrent banding of puddle ducks and scaup in Norman Wells by RP.

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6. Move the biologist's tent frame to higher ground away from the eroding riverbanks.
7. Send to camp, one roll of wire mesh for experimental trap designs.
8. Obtain a new catch box designed by Carl Ferguson.
9. Consider an *Iridium*TM satellite phone replacement if *Global Star*TM system continues to provide interrupted service at this northern latitude.
10. Purchase: filters for all motors, 1000 black cable ties, Nitrile coated work gloves, hog rings.
11. Before mid July 2008, inspect the camp, check inventory, and deliver lumber by boat during high water levels from spring run-off.
12. Enlarge the helicopter landing area suited for an *A Star*. Create alternate heli-landing sites at the downstream bend in the river and the horsetail flats if it is dry ground.
13. Brush cutting of sapling growth around camp.
14. Kitchen facility needs plywood and lumber for shelving, drop down shutters (clear polyethylene) to stop the wind, and a porch deck.
15. Prebait Willow Point trap site about 25 July with four bags (100 kg) of barley.

ACKNOWLEDGEMENTS:

We particularly thank the Board of Directors and Wilfred Lennie (President) of the TRRC for their continuing long-term commitment to this project. We thank contract crewmembers Peter Horassi, Paul Bernarde, David Menacho, and Karla Lennie for their assistance banding ducks in the field and Charlie McCauley's assistance with kitchen construction.

The SRRB (Walter Bayha, Chairperson & Jody Snortland, Executive Director) provided the funding and opportunity for Paul Bernarde to participate in the project as assistant.

Pilots with *North Wright Airways Ltd.*, *Sahtu Helicopters Ltd.* and *Canadian Helicopters Ltd.* capably and safely delivered supplies, equipment, and personnel to and from the Willow Lake camp.

Keith Hickling, (ENR Sahtu Region Superintendent, Norman Wells) authorized use of departmental resources and the assistance of the following staff: Tim Melnyk (Warehouse Stores person) loaned equipment; Paul Rivard (Manager, Forest Management) authorized helicopter assistance; Sharon Miller and Kyra Furnell (Fire Clerks) maintained daily radio checks with the crew. Simon Kearney

(GIS Specialist, Sahtu GIS Project, Norman Wells) produced Figure 2.

Sam Kivi (Manager, Corporate Services, Shared Services Centre, Norman Wells) provided administrative and financial accountability. Funding and logistical support were provided by the USFWS, SRRB, and ENR. Jim Wortham (Chief Migratory Bird Surveys, USFWS, Laurel, MD) assisted with project planning.

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FINAL REPORT
WESTERN CANADA COOPERATIVE WATERFOWL BANDING PROGRAM, 2008
WILLOW LAKE, NORTHWEST TERRITORIES

Personnel:

Nathan Zimpfer, Wildlife biologist, USFWS, DMBM-PHAB, Laurel, MD
Richard Popko, Wildlife Technician, Environment and Natural Resources (ENR),
Government of the Northwest Territories, Norman Wells, NWT, Canada

August 6- August 19

Paul Bernarde, Tulita Renewable Resources Council, Tulita, NWT
Mike Etchinelle, Tulita Renewable Resources Council, Tulita, NWT

August 20 – September 1

Peter Horrassi, Tulita Renewable Resources Council, Tulita, NWT
Shaun Etchinelle, Tulita Renewable Resources Council, Tulita, NWT

Abstract:

During the 2008 banding season 1,944 ducks (978 northern pintails, 531 mallards, 322 American green-wing teal, 99 American wigeon, 13 blue-wing teal, and 1 lesser scaup; Table 1.) were banded. This was the third highest catch for this station since it opened in 1995. Over the 20 days of trapping (13 Aug- 1 Sep), 3,474 ducks were handled. We encountered 12 foreign recaptures, and 53 recaptures from prior years. We had 16 mortalities, mostly from mink during the last week of trapping. Water levels remained good for the entire month of trapping, due to 14 days of rain. Daytime temperatures throughout the month never exceeded 65°F (18°C), and most of the time hovered in the 50-60°F (10-15°C) range.

Narrative:

I arrived in Norman Wells on Monday 4 August. The following day was spent grocery shopping for the crew, assembling banding gear, necessary fuel, and obtaining other items from forestry operations (chainsaw, brush cutter, 2-way radio, and water pump). In addition, we spent time discussing tasks that need to be accomplished while at Willow Lake (65° 14' N, 125° 25' W), current water levels, and potential for scaup banding as well as areas where scaup might be encountered based on local and historical information. I flew into Willow Lake on 6 Aug, via Pilatus Porter with all of the banding gear and supplies. The plane then continued on to Tulita to pick up the first crew. Crews were scheduled to be swapped out on 19 Aug. however, due to rain and a backlog of plane charters, the change didn't occur until 20 Aug.

Upon arrival at Willow Lake we set up camp, checked out potential trapping locations, and how the traps fared the winter at cache point. This year Willow Lake had good water levels and we were able to use the original willow point trapping location, on the SW side of the lake. This location is ideal for trapping, since the bottom is hard sand and slopes about 1 inch every 8 feet.

At the conclusion of last years trapping season, one of the tasks identified for this year was trap repair. All of the traps are at least 6 years old, and some are approaching 10 yrs, and on many the bottom sections are becoming rusted and brittle. For the next 3-days we cut 4 inches off the bottoms, and assembled the new shorter Benning B-2 traps at the trap site and pre-baited daily. In addition, the funnel sections were shortened from 4-ft, to 2-ft. One advantage to this is that the modified traps are no longer center heavy, and can be carried or repositioned easily by two people, whereas, the original design required three people. A total of 20 traps were at willow point, and trapping began (i.e. closed funnels and blocked doors) on 13 Aug.

In total for the 2008 banding season we banded 1,944 ducks (978 northern pintails, 531 mallards, 322 American green-wing teal, 99 American wigeon, 13 blue-wing teal, and 1 lesser scaup; Table 1.). This was the third highest catch for this station since it opened in 1995. The Willow Lake banding station is unique, as there is only a single trapping location, however, as the trapping period progresses, the number of same year recaptures can increase substantially, potentially to the point of capturing mostly banded birds on a daily basis. It is possible that a good day's catch of 200 ducks could result in only a handful of new birds for banding. In total, 3,474 ducks were handled from 13 Aug- 1 Sep (20 days). We also encountered 12 foreign recaptures, and 53 recaptures from prior years. Over the course of trapping 5,126 lbs (2,325 Kg) of barley were used, or about 50% of what remained in the storage silo at Willow Lake. Over the course of trapping we had 16 mortalities, mostly from mink during the last week of trapping.

In the past, the number of same year recaptures has been large enough that it may have limited new unbanded birds from entering the traps. The solution to this has been to run the traps twice daily. Towards the end of the month, we felt that this might have been occurring and periodically ran the traps in the morning and evening in an attempt to further boost band numbers. Running the traps twice a day didn't appear to improve catch substantially, however, it did appear that most of our birds were entering the traps during the evening feeding flight, versus the morning feeding flight. We continued to run the traps twice a day the last couple of days in an attempt to limit mortality from mink that appeared to be increasing.

Other notable events during the trapping season were the capture of a drake pintail in full breeding plumage and a blue-wing teal on 29 Aug. Typically, blue-wing teal are captured only during the first few days of trapping. On 18 Aug, Ducks Unlimited Canada flew into Willow Lake to observe our trapping operations as part of an introductory tour of the western boreal region for their new executive vice president.

Weather overall was less than desirable, but didn't appear to have an impact on trapping success. Fourteen of the 27 days while at Willow Lake, we had rain. Rainfall events ranged from periodic light misting to continuous heavy downpours with high winds for most of the day. These conditions made for wet banding, but likely contributed to good water levels for the entire month. Daytime temperatures throughout the month never exceeded 65°F (18°C), and most of the time hovered in the 50-60°F (10-15°C) range.

Table 1. Season at a Glance Statistics.

Species																
Trap Day	Date	American Green-winged teal		American wigeon	Northern pintail	Mallard	Recaptures	New Bands/Day	Total Daily Catch	% Catch New Bands	Running					
		winged teal	teal								Total of new bands	Catch	Trap Nights			
1	13-Aug	67	7	14	16	0	0	104	104	100.00%	104	104	20			
2	14-Aug	45	4	5	9	1	11	64	75	85.33%	168	179	20			
3	15-Aug	23	1	5	6	2	35	37	72	51.39%	205	251	20			
4	16-Aug	23	0	32	105	16	48	176	224	78.57%	381	475	20			
5	17-Aug	9	0	10	145	83	66	247	313	78.91%	628	788	20			
6	18-Aug	12	0	3	84	60	85	159	244	65.16%	787	1032	20			
7	19-Aug	12	0	1	5	12	15	30	45	66.67%	817	1077	20			
8	20-Aug	53	0	8	103	13	53	177	230	76.96%	994	1307	19			
9	21-Aug	29	0	9	91	39	117	168	285	58.95%	1162	1592	20			
10	22-Aug	6	0	2	73	41	89	122	211	57.82%	1284	1803	20			
11	23-Aug	0	0	6	72	25	104	103	207	49.76%	1387	2010	19			
11	23-Aug	5	0	0	13	21	Not Recorded	39	39	100.00%	1426	2049	0			
12	24-Aug	8	0	1	61	23	107	93	200	46.50%	1519	2210	20			
13	25-Aug	8	0	0	47	42	173	97	270	35.93%	1616	2480	20			
14	26-Aug	3	0	1	29	29	131	62	193	32.12%	1678	2673	20			
15	27-Aug	4	0	0	33	39	143	76	219	34.70%	1754	2892	20			
15	27-Aug	0	0	1	27	20	95	48	143	33.57%	1802	3035	0			
16	28-Aug	1	0	0	5	8	62	14	76	18.42%	1816	3111	20			
16	28-Aug	2	0	1	13	11	58	27	85	31.76%	1843	3196	0			
17	29-Aug	4	1	0	10	15	73	30	103	29.13%	1873	3214	20			
18	30-Aug	4	0	0	11	12	76	27	103	26.21%	1900	3317	20			
19	31-Aug	1	0	0	4	3	38	8	46	17.39%	1908	3363	20			
19	31-Aug	1	0	0	11	7	46	19	65	29.23%	1927	3428	0			
20	1-Sep	2	0	0	5	9	30	16	46	34.78%	1943	3474	20			
Seasonal Totals		322	13	99	978	531	1655						398			
Average/Day		13.42	0.54	4.13	40.75	22.13	71.96	80.96	149.92							

Ageratios (young/adult) at catch

Species	Ageratio
NOPI	0.54
MALL	0.33
AGWT	0.57
AMWI	0.46
BWTE	0.44

Mortalities

Date	Species	Number	Banded	Cause
8/16/2008	NOPI	1	0	Trap Stress
8/26/2008	AMWI	1	1	Drowning
8/28/2008	AGWT	4	2	Mink
8/31/2008	MALL	4	3	Mink
	AGWT	3	2	Mink
9/1/2008	MALL	1	1	Mink
	NOPI	2	1	Mink
		16		

Accidentals

Date	Species	Number
8/26/2008	LESC	1

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Richard Popko, Wildlife Technician, Environment and Natural Resources (ENR),
Government of the Northwest Territories, Norman Wells, NWT, Canada

August 5- August 31

Paul Bernarde, Tulita Renewable Resources Council, Tulita, NWT
Peter Horrassi, Tulita Renewable Resources Council, Tulita, NWT

August 5 – August 18

Carlos Bernard, Student, Tulita Renewable Resources Council, Tulita, NWT

August 18 – August 31

Wade Karkagie, Student, Tulita Renewable Resources Council, Tulita, NWT

Abstract:

In 2009, the Tulita Renewable Resources Council (TRRC), the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR), and the United States Fish and Wildlife Service (USFWS) collaborated in the 15th consecutive year (1995-2009) of duck banding at Willow Lake (65°14' N; 125°25' W) in the Mackenzie River Valley, Sahtu Settlement Area, NWT. Our annual goal is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to the opening day of waterfowl hunting in the NWT (01 September). The USFWS, Sahtu Renewable Resources Board (SRRB), and ENR provided funding for the project. A Waterfowl Biologist (USFWS) supervised two contract Banding Assistants (TRRC) and two crewmembers hired by the SRRB. A maximum of 24 funnel traps were set for a total of 486 trap-nights during 11 to 31 August. Trap success was 3.2 ducks per trap night. A total of 1803 kg (3975 lb) of barley was used as bait. Standard leg bands (Call 1-800-327-BAND) were placed on 1549 ducks: 895 mallards (58% of all ducks banded), 511 northern pintails (33%), 90 American green-winged teal (*A. crecca*; 6%), 50 American wigeon (*A. Americana*; 3%), 2 northern shoveler (*A. clypeata*) and one blue-winged teal (*A. discors*). The number of ducks banded in 2009 was 10.4% above the 1995-2009 average of 1388 ducks. The greatest one day catch of unbanded birds occurred on 13 August, and the greatest total catch in one day occurred on 25 August with a catch of 225 ducks. Willow Lake water levels were average to slightly above average for the 2009 season. Eighteen percent of banded ducks (N= 276) were in the hatch-year or local age-class, which is less than the 1995-2009 station average of 33 % juvenile age class. Eighty-four recaptures were recorded, of which 16 were foreign recaptures and 68 recaptures of birds banded in prior years.

Background:

Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area of the Northwest Territories (NWT), sometimes support dense summer populations of molting, non-breeding adult ducks, particularly when drought conditions occur in more southern breeding areas. In some years there is excellent hatching success and productivity.

Since 1995, the United States Fish and Wildlife Service (USFWS) has collaborated with the Tulita Renewable Resources Council (TRRC) and the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR) to band ducks within the Sahtu. The annual goal of the project is to band 2000 mallards (*Anas platyrhynchos*), 1500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1000 per species) prior to 01 September, which is the opening day of the duck-hunting season in the NWT.

The project was initially established at Loche Lake northeast of Tulita in 1995 (Popko et al. 1995; Figure 1); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 the banding station was moved to the nearby and larger Willow Lake (65°14' N; 125°25' W) where it has since remained (Popko et al. 1997, 1998, 2002, 2003, 2004, 2005, 2006, 2007; Bidwell et al. 1999, 2000, 2001; Zimpfer et al. 2008). In 2002, the banding project camp and trap-site locations were moved from the inlet of Willow Lake to the better sandy substrate area found near the outlet of Willow Lake (Figure 1).

Willow Lake lies within the selected (i.e., private) lands of the Sahtu Dene and Métis under the terms of the Sahtu Dene and Métis Comprehensive Land Claim Agreement (Dept. of Indian and Northern Affairs Canada, 1993). The Tulita Lands Corporation is responsible for approving terms of access to private lands within the Tulita District, including the Willow Lake watershed. Further, the land claim gives the TRRC responsibility for involvement in, and approval of, wildlife research and management projects in and near their community. Therefore, we obtained permission to enter these private lands, and to construct and occupy the project's base camp, from the Tulita Lands Corporation with the support of the TRRC. The Willow Lake banding project camp now consists of two frame cabins and a storage silo. The silo provides storage for large quantities of bait, food, and supplies, which reduces transportation costs.

The Willow Lake area has been proposed as a Conservation Zone in the draft Sahtu Land Use Plan (Sahtu Land Use Planning Board 2002). Further, the lake and the extensive wetland complex along the Brackett River south to the Great Bear River have been proposed as an Area of Interest under the NWT Protected Area Strategy through the Tulita Conservation Initiative. These proposed designations would prohibit non-renewable resource development and protect these critical waterfowl wetlands.

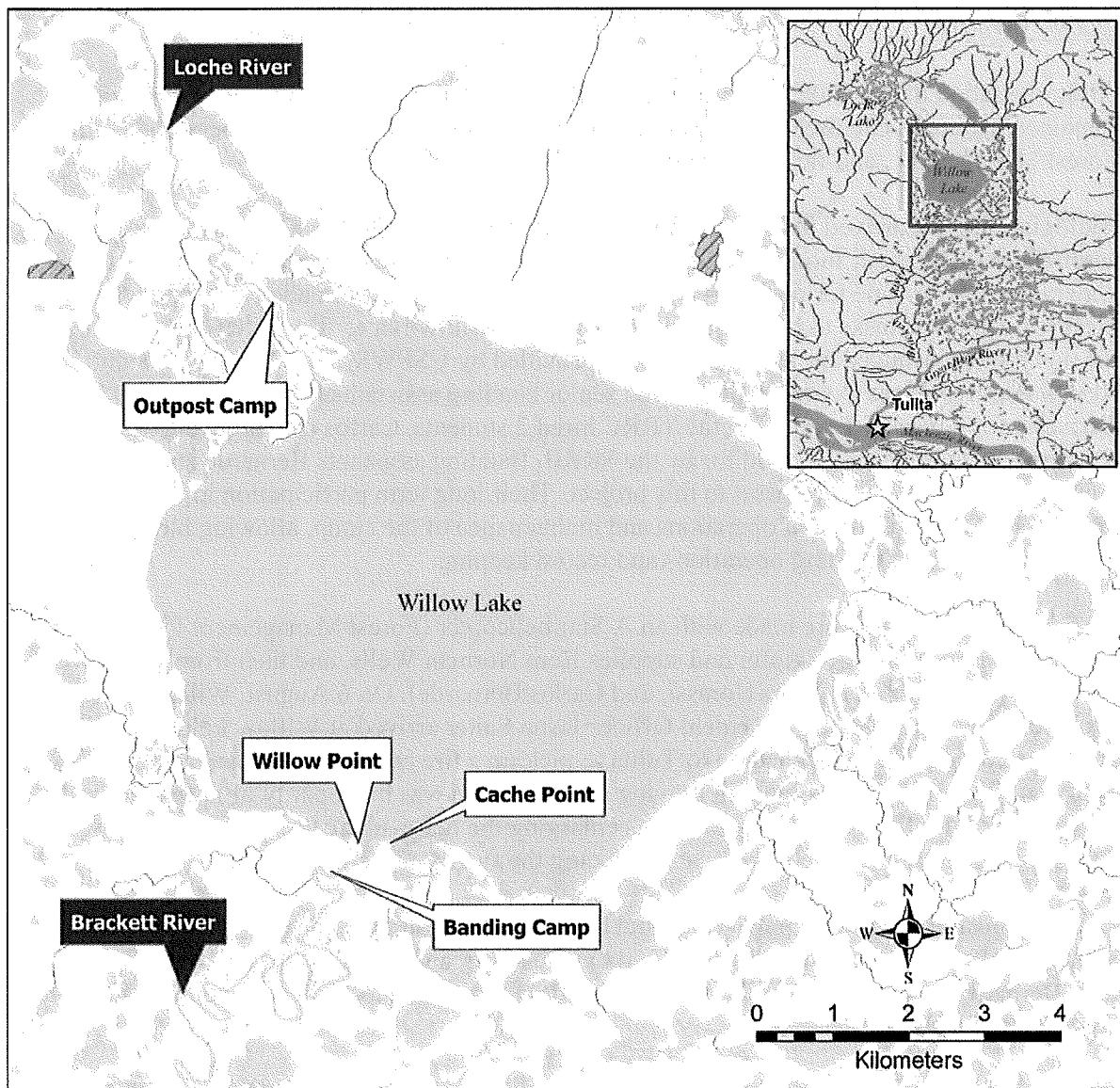


Figure 1. Willow Lake duck banding camp, Tulita District, Northwest Territories.

2009 Narrative:

At the cessation of the 2008 banding season, the crew (Paul Bernarde and Mike Etchinelle) remained behind to enclose existing tent frames into frame cabins, using lumber donated from Forest Management, and flown in via Twin Otter airplane-on-floats.

Biologist Zimpfer arrived in Norman Wells on Monday 3 August. Final preparations (i.e., assemble banding gear, food, fuel, and obtaining items from forestry operations [chainsaw, 2-way radio]) were made for departure to Willow Lake on 5 August. In addition, time was spent discussing specific tasks to be accomplished while at Willow Lake. The TRRC has a contract for this project arranged by ENR using funds provided by USFWS. The TRRC and Sahtu Renewable Resources Board (SRRB) hired senior banding assistants Peter Horassi, and Paul Bernarde for 4 weeks. In addition the TRRC hired 2 students, Carlos Bernarde and Wade Karkagie, each for 2 weeks, paid for by the SRRB. Banding assistants Bernarde and Horassi continue to be an invaluable asset to this project. Their long term participation in this project ensures smooth cost-efficient operations and maintenance of the camp, allowing biologist Zimpfer to focus on banding operations and record keeping.

On 5 August two trips were made with an A Star helicopter (Forest Management ENR in-kind contribution), delivering Zimpfer and supplies from Norman Wells, and then from Tulita with the Crew (Paul Bernarde, Peter Horassi, and Carlos Bernarde). On 6 August, Wildlife Technician Richard Popko and ENR Enforcement Officer Jason Salter arrived at Willow Lake via A Star helicopter which then continued on to Tulita to pick up a fire crew (Forest Management ENR in-kind contribution). They assisted in moving a cabin which was in jeopardy of falling into the river, as a result of bank erosion, as well as enlarging the heli-pad created in 2008 to accommodate a Bell 212 helicopter, and reducing the fire hazard around camp.

On 14 August, Bernard was medi-vaced out to the Tulita Health Center via Pilatus Porter due to an injury (broken and bruised rib) sustained by a fall over a sled while looking for a boat fuel line. Bernard was cleared to work by medical staff and returned to Willow Lake during the crew change on 18 August.

A resupply and crew change occurred on 18 August, taking Carlos Bernarde back to Tulita, and bringing Paul Bernarde and Wade Karkagie to Willow Lake via Eurocopter 130 (Forest Management ENR in-kind contribution). Also on 18 August, Forest Management (ENR; in-kind contribution) delivered 3000 lb of barely to Willow Lake with their contract Helicopter. All grain bags were marked with the current year, and stored in the silo.

Daily communication occurred between the banding crew and ENR in Norman Wells by Forest Management's radio system. No communication occurred on weekends, as the radio is not staffed by ENR on weekends. On cloudy overcast days, communication via radio was spotty or barely comprehensible. After 27 August, all communication via radio was lost when Forest Management removed the Clark Mountain repeater for repairs. This repeater was necessary to contact Norman Wells by radio. However, Iridium satellite phone service was used as a substitute. Connection and speech clarity of the Iridium service continue to be exceptional. Generator-produced electricity at camp is essential for computer data entry and to run a freezer

for food storage. ENR and SRRB policies do not allow crew members to hunt while they are working on projects. During August the banding crew was the only people present at Willow Lake.

All garbage was removed from site and taken for disposal at the Norman Wells landfill. Near the end of August, black bears (*Ursus americanus*) visited the Willow Point and the camp without causing any problems. Bald (*Haliaeetus leucocephalus*) and Golden eagles (*Aquila chrysaetos*) regularly perched in trees behind the trap site. On a number of occasions, the crew observed eagles predating or attempting to predate waterfowl released during banding operations. Despite these behaviors, the crew was able to confirm only a single mortality, but expect predation to be higher.

This year Willow Lake had good navigatable water levels and we were able to use the original Willow Point trapping location, on the SW side of the lake. This location is ideal for trapping, since the bottom is hard sand and slopes about 1 inch every 8 feet. However, in the future years with adequate water levels and fuel the crew may explore trapping in the Loche River in addition to Willow Point. It has become apparent that some ducks spend the entire month in various pockets of the river and don't move downstream to Willow Lake in August. This has the potential to increase catch with a marginal increase in effort.

The project's boats, motors, carousel, floaters, camping equipment, bait (approximately 5000 lb of barley), and supplies are stored inside the grain silo at the banding camp for next year. All traps are folded and piled in the bush at the east side of the Willow Lake outlet at Cache Point (Figure 1.).

Results:

Water levels for the 2009 trapping season were average to above average at Willow Lake. The crew was able to use the original Willow Point trapping location, on the SW side of the lake. Good weather persisted for most the month, with around 4-5 days of rain. Most of the rain occurred early in the morning prior to banding or late at night. This year experienced unseasonably warm temperatures near 30°C for a few days during the last week of August. In total, the crew banded 1549 ducks (511 northern pintails, 895 mallards, 90 American green-wing teal, 50 American wigeon, 1 blue-wing teal, and 2 northern shovelers; Table 1.).

A total of 24 traps were set at Willow Point, and trapping began (i.e., reduced funnel size and doors blocked) on 11 August. In total, 2902 ducks were handled from 11 Aug – 31 Aug (21 days). This resulted in a total of 486 trap nights, with an average of 3.2 ducks per trap night (Table 1, Table 2). Banding operations also resulted in 16 foreign recaptures and 68 recaptures of birds banded in prior years. Over the course of trapping 3975 lbs (1803 Kg) of barley were used.

The total number of ducks banded at this station since 1995 is 20,823. The overall species composition of the 13 species banded is primarily mallard (47%) and northern pintail (32%) followed by American green-winged teal and American wigeon at ten percent each. Thirty three

percent of all ducks banded since 1995 were juvenile age-class. Eighteen percent of 2009 ducks banded were juveniles suggesting lower than average local duck production this summer.

While no trap mortality occurred, mortality from Bald and Golden Eagles may have a problem. On a number of occasions, the crew observed eagles predating or attempting to predate waterfowl released during banding operations. Despite these behaviors, the crew was able to confirm a single mortality of a juvenile mallard from a juvenile bald eagle.

In comparison to previous trapping activities, this year's catch of 1549 ducks was 10.4% above the 1995-2009 mean of 1388 ducks. Given good habitat conditions on the prairie's this year, it was expected that the bulk of the catch would be mallards.

One notable event during this year's operation was the capture of an adult (AHY) male canvasback. Unfortunately, an existing neck injury prevented banding this individual. Other general observations from this year's banding activity were, 1.) Most of the catch was AHY birds. 2.) We did not catch American wigeon in proportion to what was observed around Willow Lake. During cruise surveys the crew observed large numbers of AHY male American wigeon, sometimes flocks as large as 150, yet only 50 were banded, 3.) Again this year there were good numbers of scaup (*Athya spp.*) on the lake (not all molting males), and were flightless at the time of arrival on 5 Aug, in addition to some molting tundra swans. 4.) Migrating Canada geese arrived early at Willow Lake this year, around the 20th of August.

Recommendations for 2010:

1. Purchase and deliver 2265 kg (5000 lb) of barley on the winter road to Norman Wells during Jan-Feb 2010.
2. Consider trapping in locations other than Willow Point in an attempt to meet stated banding objectives, and reduce avian predator concentrations at Willow Point (e.g. Out pockets in Loche River circa 1995 banding, North end of Lake), conditional on water levels.
3. Consider obtaining bands for tundra swans, and potentially attempt to band molting tundra swans on Willow Lake.
4. Design and construct traps for potential scaup banding.
5. Have USFWS deliver a new catch box with the modified Ferguson door during 2010 Spring Surveys for delivery to Willow Lake during the following season.
6. Construct new puddle duck traps, considering designs other than the Benning B-2.
7. Move out house to new location.
8. Continue to reduce the fire hazard around camp. During spring run-off, June 2010, ENR personnel could access camp by boat from Tulita and stay a few days to Fire Smart the area.

2009 Banding Report – Willow Lake, NWT

Species															
Trap Day	Date	American Green-winged teal	Blue-winged teal	American wigeon	Northern pintail	Mallard	Other Species	Recaptures	New Bands/Day	Total Daily Catch	% Catch New Bands	Running Total of New Bands	Running Catch	Trap Nights	
1	11-Aug	43	0	17	19	24	0	1	104	105	99.05%	104	105	24	
2	12-Aug	12	0	2	16	75	0	9	105	114	92.11%	209	219	24	
3	13-Aug	10	0	4	31	85	0	30	130	160	81.25%	339	379	24	
4	14-Aug	4	0	4	3	56	0	35	67	102	65.69%	406	481	24	
5	15-Aug	6	0	0	10	31	0	29	47	76	61.84%	453	557	24	
6	16-Aug	1	0	0	14	43	0	41	58	99	58.59%	511	656	24	
7	17-Aug	0	0	1	12	40	0	40	53	93	56.99%	564	749	23	
8	18-Aug	0	0	10	14	42	0	53	66	119	55.46%	630	868	24	
9	19-Aug	2	0	4	38	60	1	74	105	179	58.66%	735	1047	24	
10	20-Aug	1	0	0	14	30	0	63	45	108	41.67%	780	1155	23	
11	21-Aug	0	0	0	35	35	0	57	70	127	55.12%	850	1282	24	
12	22-Aug	0	0	0	33	50	1	76	84	160	52.50%	934	1442	23	
13	23-Aug	3	0	1	27	39	0	84	70	154	45.45%	1004	1596	23	
14	24-Aug	3	0	2	23	32	0	77	60	137	43.80%	1064	1733	24	
15	25-Aug	2	0	1	70	42	0	110	115	225	51.11%	1179	1958	24	
16	26-Aug	0	0	1	39	22	0	82	62	144	43.06%	1241	2102	23	
17	27-Aug	3	0	2	44	32	0	121	81	202	40.10%	1322	2304	24	
18	28-Aug	0	0	0	37	38	0	101	75	176	42.61%	1397	2480	24	
19	29-Aug	0	0	0	14	58	0	93	72	165	43.64%	1469	2645	24	
20	30-Aug	0	0	1	13	33	0	93	47	140	33.57%	1516	2785	23	
21	31-Aug	0	0	0	5	28	0	84	33	117	28.21%	1549	2902	12	
Seasonal Totals															
		90	1	50	511	895		1353				1549	2902	486	
Average/Day		4.29	0.05	2.38	24.33	42.62		64.43	73.76	138.19					

Accidentals & Rare Occurrences		
Date	Species	Number
8/15/2009	CANV*	1
8/19/2009	NSHO	1
8/22/2009	NSHO	1

* Not Banded. Neck injury from what appeared to be a result from getting stuck in gill net, or Eagle talon.

Mortalities			
Date	Species	Number	Cause
8/14/2009	MALL	1	1 Eagle
8/19/2009	NSHO*	1	1 Eagle
TOTAL		2	

* Witnessed Eagle take duck we banded in weeds. Believed to be L NSHO, although unable to verify.

Ageratios (young/adult) at catch		
Species	Ageratio	
NOPI	0.317	
MALL	0.182	
AGWT	0.125	
AMWI	0.111	

Table 2. Trapping Success Duck Banding at Willow Lake, NT, 1995 to 2009.

Year	Barley (lb)	Dates Trapped August	Maximum Number of Traps	Trap Nights (TN)	Number of Ducks Banded	Trapping Success (Ducks / TN)
1995	1500	2 to 21	7	119	509	4.3
1996	4500	9 to 30	17	195	1892	9.7
1997	3500	8 to 29	14	291	1687	5.8
1998	4000	13 to 30	16	262	1700	6.5
1999	5620	3 to 31	16	439	1248	2.8
2000	4463	3 to 30	18	490	1600	3.3
2001	3940	4 to 30	18	451	404	0.9
2002	6100	5 to 29	18	416	2168	5.2
2003	5061	6 to 30	18	423	1348	3.2
2004	4022	9 to 30	20	470	1298	2.8
2005	3030	8 to 30	13	293	1019	3.5
2006	3856	8 to 30	19	408	2083	5.1
2007	4022	12 to 30	18	324	374	1.2
2008	5126	13 to 1	20	398	1944	4.9
2009	3975	11 to 31	24	486	1549	3.2
Mean	4181	2 to 31	17	364	1388	3.8

FINAL REPORT
WESTERN CANADA COOPERATIVE WATERFOWL BANDING PROGRAM, 2014
WILLOW LAKE, NORTHWEST TERRITORIES

Personnel:

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(ENR), Government of the Northwest Territories, Norman Wells, NWT, Canada

August 6–August 28

Philip Clemente, Sahtu Renewable Resources Board, Tulita, NWT

Kyle Yakeleya, Sahtu Renewable Resources Board, Tulita, NWT

Abstract:

In 2014, the Sahtu Renewable Resources Board (SRRB), the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR), and the United States Fish and Wildlife Service (USFWS) collaborated in the 18th year (1995-2009, 2011, 2013-2014) of duck banding at Willow Lake (65° 14' N; 125° 25' W) in the Mackenzie River Valley, Sahtu Settlement Area, NWT. Our annual goal is to band 2,000 mallards (*Anas platyrhynchos*), 1,500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1,000 per species) prior to the opening day of waterfowl hunting in the NWT (01 September). The USFWS, SRRB, and ENR provided logistical support for the project. A Waterfowl Biologist (USFWS) supervised one contract Banding Assistant (TRRC) and one student crewmember hired by the SRRB. A total of 19 funnel traps were set for a total of 320 trap-nights during 10 to 27 August. Trap success was 3.9 ducks per trap night. A total of 1425 kg (3150 lb) of barley was used as bait. Standard leg bands (Call 1-800-327-BAND) were placed on 1,251 ducks: 631 mallards (50% of all ducks banded), 421 northern pintails (34%), 11 American wigeon (*A. americana*; 8%), 81 American green-winged teal (*A. crecca*; 6%), 12 blue-winged teal (*A. discors*; 1%) and 6 northern shoveler (*A. erythra*; <1%). The number of ducks banded in 2014 was 10% below the 1995–2013 average of 1390 ducks. The greatest one day catch of birds occurred on 22 August, with a catch of 198 birds of which 143 were unbanded. Water levels at Willow Lake were below average for the 2014 season. Approximately 35% of banded ducks (N= 444) were in the hatch-year or local age-class. Twenty-five recaptures of birds banded in previous years or from stations other than Willow Lake were recorded.

✓

* still need
grain estimate...

81 bags → 4,471.2 lbs remain

Background:

✓ Boreal wetlands along the Mackenzie River Valley, such as Willow Lake (Figure 1) in the Sahtu Settlement Area of the Northwest Territories (NWT), sometimes support dense summer populations of molting, non-breeding adult ducks, particularly when drought conditions occur in more southern breeding areas. In some years there is excellent hatching success and productivity.

[Since 1995, the United States Fish and Wildlife Service (USFWS) has collaborated with the Tulita Renewable Resources Council (TRRC) and the Government of the Northwest Territories' Department of Environment and Natural Resources (ENR) to band ducks within the Sahtu.] The annual goal of the project is to band 2,000 mallards (*Anas platyrhynchos*), 1,500 northern pintail (*A. acuta*), and all incidentally captured ducks (up to 1,000 per species) prior to 01 September, which is the opening day of the duck-hunting season in the NWT.]

The project was initially established at Loche Lake and Loche River northeast of Tulita in 1995 (Popko et al. 1995; Figure 1); however, based on local Traditional Knowledge (Popko et al. 1996), in 1996 the banding station was moved to the nearby and larger Willow Lake (65° 14' N; 125° 25' W) where it has since remained (Popko et al. 1997, 1998, 2002, 2003, 2004, 2005, 2006, 2007; Bidwell et al. 1999, 2000, 2001; Zimpfer et al. 2008, 2009, 2011, 2013). [In 2002, the banding project camp and trap-site locations were moved from the inlet of Willow Lake to the better sandy substrate area found near the outlet of Willow Lake (Figure 1).]

rework with
added
N. ent
trap sites

Willow Lake lies within the selected (i.e., private) lands of the Sahtu Dene and Métis under the terms of the Sahtu Dene and Métis Comprehensive Land Claim Agreement (Dept. of Indian and Northern Affairs Canada, 1993). The Sahtu Renewable Resources Board (SRRB) is the main instrument for wildlife management in the Sahtu Land claim area and supports this project. The Tulita Lands Corporation is responsible for approving terms of access to private lands within the Tulita District, including the Willow Lake watershed. [Further, the land claim gives the TRRC responsibility for involvement in, and approval of, wildlife research and management projects in and near their community. Therefore, we obtained permission to enter these private lands, and to construct and occupy the project's base camp, from the Tulita Lands Corporation with the support of the TRRC.] The Willow Lake banding project camp consists of two frame cabins, a frame kitchen, and a storage silo. The silo provides storage for large quantities of bait, food, and supplies, which reduces transportation costs.]

new
P

↖ and explain more ammunition
to boast as decent Bush
camp

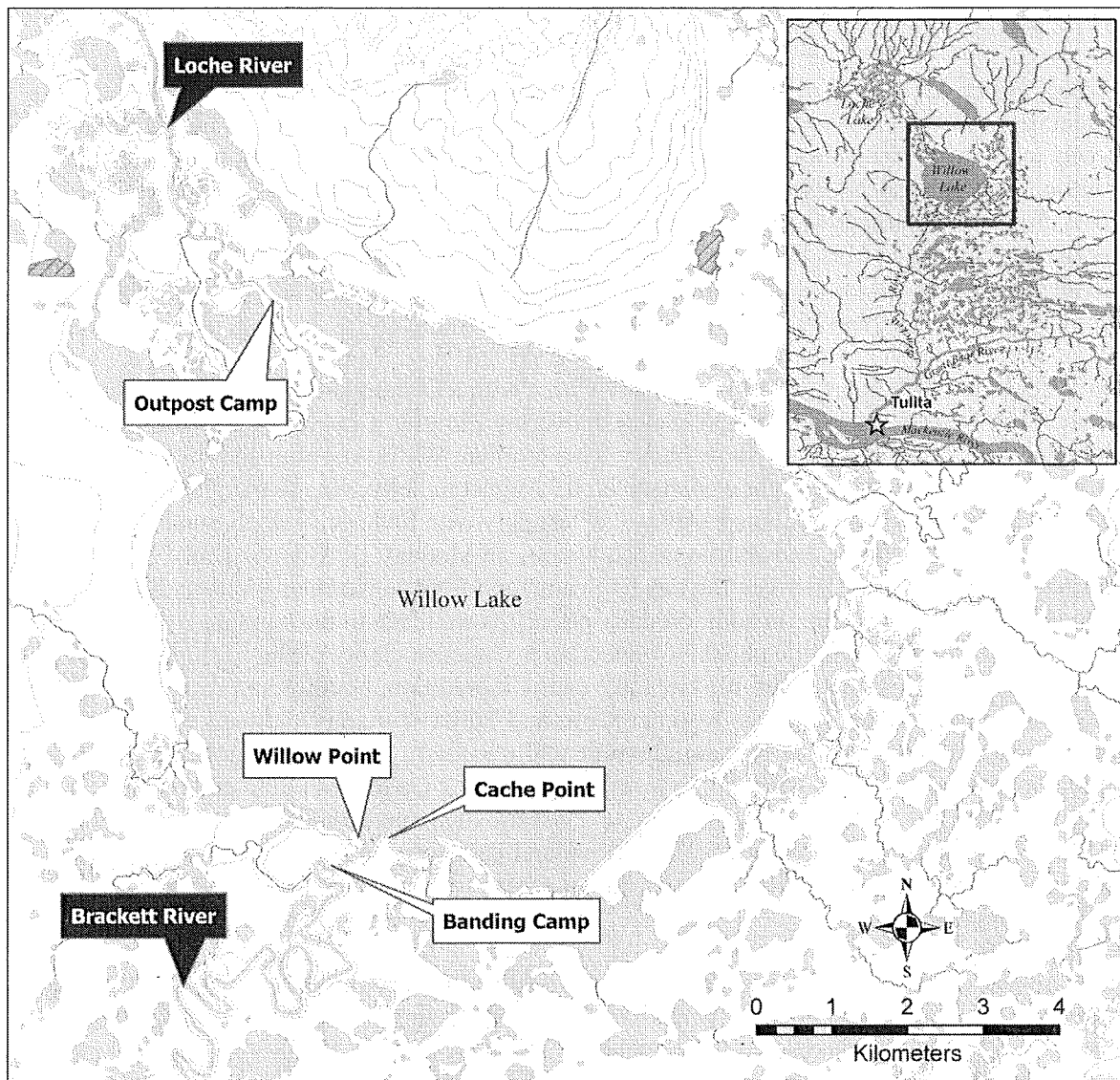


Figure 1. Willow Lake duck banding camp, Tulita District, Northwest Territories.

2014 Narrative:


Biologist Zimpfer arrived in Norman Wells on Sunday 03 August. Final preparations (i.e., assemble banding gear, food, fuel, and obtain items from ENR forestry operations (A chainsaw, 2-way radio, and brushcutter) were made for departure to Willow Lake on 06 August. In addition, time was spent discussing specific tasks to be accomplished while at Willow Lake. For 2014, the SRRB committed monies to hire the local banding crew from Tulita, NWT based on some broad guidance from biologist Zimpfer. The SRRB hired senior banding assistant Philip Clemente, and secondary school student, Kyle Yakeleya for 22 day banding period. Phillip has previously worked at the Willow Lake station in 2011. more?

On Wednesday 06 August one trip was made with a with a Dehaviland Twin Otter on-floats (North Wright Airways Ltd, Norman Wells) delivering Zimpfer, Clement, Yakeleya, supplies, and approximately 1200 lbs of whole barley from Norman Wells, to Tulita and then to willow lake. A second Twin Otter flight was made on 07 August to deliver the remainder of the barley that was delivered to ENR in January 2014. A resupply with fuel occurred on Sunday 10 August, via Pilatus Porter, and additional food stores on Monday 18 August. Daily communication occurred between the banding camp and ENR in Norman Wells by Forest Management's radio system, in addition daily check-ins we made to the banding coordinator in Saskatoon via Iridium satellite phone. Connection and speech clarity of the Iridium service continue to be exceptional at the Willow Lake camp. In addition, Northwestel recently upgraded the cellular phone system to 3G in Norman Wells and Tulita. Verizon customers will now be able to connect to the network in roaming mode while in town. Further, those with recent generation smart phones like the Apple Iphone, or Samsung Galaxy can send and receive text messages from the Willow Lake camp, and to a lesser extent make phone calls. Generator-produced electricity at camp is essential for computer data entry and to run a freezer for food storage. Finally, ENR and SRRB policies do not allow crew members to hunt while they are working on projects.


?
All garbage was removed from site and taken for disposal at the Norman Wells landfill. Black bears (*Ursus americanus*), wolves (*Canis Lupus*), and bald eagles (*Haliaeetus leucocephalus*) were seen around camp and the Willow Point banding site, none paid more than a casual interest in the traps. It was believed that a bear may have been hanging around the camp as the crew found recent scat while outside the fence, and we had one instance where a bear approached the fence while we were in camp, and a second instance where a bear pulled on the electric fence while we were banding.


X
This year water levels at Willow Lake were below normal, however we were able to use the original Willow Point trapping location, on the SW side of the lake. This location is ideal for trapping, since the lake substrate is hard sand and slopes about 1 inch every 8 feet. However, in the future years with adequate water levels and fuel the crew may explore trapping ducks in the Loche River in addition to Willow Point. It has become apparent that some ducks spend the entire month in various pockets of the river and don't move downstream into Willow Lake in August. This has the potential to increase catch with a marginal increase in effort.


2014 Banding Report – Willow Lake NWT


 The project's boats, motors, carousel, floats, camping equipment, bait (approximately 3600 lbs. of barley), and supplies are stored inside the grain silo at the banding camp for next year. As of 2013 the USFWS catch box stored in the silo was upgraded with the new "Ferguson design" aluminum doors and rails. Due to continued erosion of cache point during spring ice breakup, all to the traps have been relocated to the camp site for storage on an elevated platform.

Results:

 Water levels for the 2014 trapping season were below normal at Willow Lake. Despite below normal water levels we were able to utilize the original Willow Point trapping location, on the SW side of the lake for trapping. With low water levels traps were located at the very edge of the sand bar which is ideal for trapping. Normally, water levels in the Willow Lake system drop as the month progresses. This year there appeared to be minimal drop in water levels over the month, minimizing the need to relocate traps. Weather was average this year, with 9 days of rain. In most cases rain occurred early in the morning prior to banding, however, there were 2 days of heavy rain during the banding window. Otherwise, weather was typical for the NWT region. Several forest fires around the area periodically created hazy conditions, however this dissipated as the month progressed and temperatures cooled. Daily high temperatures at the close of banding operations ranged between 17–21°C (62–69°F), and evening lows were between 3–9°C (37–49°F).

 A total of 19 traps were set at Willow Point, and trapping began (i.e., reduced funnel size and doors closed) on 11 August. In total, 1,251 ducks were handled from 10 Aug– 27 Aug (19 days), ducks (631 mallards, 421 northern pintails, 100 American wigeon, 81 American green-winged teal, 12 blue-winged teal, 6 northern shoveler; Table 1.). This resulted in a total of 320 trap nights, with an average of 3.9 ducks per trap night (Table 1, Table 2). In comparison to previous trapping activities, this year's catch was 10% below the 1995–2013 mean of 1390 ducks. Banding operations also resulted in the recapture of 25 birds banded in prior years or from stations other than Willow Lake. Over the course of trapping 1,425 kg (approximately 3,150 lb) of barley were used as bait. In contrast to 2013, there was only a single mortality during trapping operations, which was a cranial injury from impacting with the wire top of the trap.

 Since 1995, 24,887 ducks have been banded at the Willow Lake Station. The species composition of the 4 most common species banded is mallard (46%) and northern pintail (33%) followed by American green-winged teal and American wigeon at 10% each, respectively. On average, 32% of all ducks banded since 1995 were of the juvenile age-class.

 General observations from this year's banding activity were that waterfowl densities were low at the beginning of the month and increased at the end of the month on Willow Lake proper. On occasion, when we were able to navigate the river it was notably absent of all waterfowl. Typically, the rivers has good numbers of ducks were interested in and red-breasted mergansers (*Mergus serrator*). Unlike other stations this year we noticed fewer than normal broods, and only captured 6 individuals of the local age class.

Camp Notes:

⑦ In the next few years the Willow Lake banding camp will see an increased need for attention and maintenance. Due to overstory clearing, the camp continues to see settling from the thawing of the permafrost. The camp now has a noticeable slope toward the river. In addition, the bank continues to erode during the spring runoff, such that the kitchen is now approximately 8 feet from the edge and will require relocation in order to keep it from falling into the river. Finally, the silo continues to be a target for break-ins. Once again, the silo was broken into during the spring of 2014. Our best guess is that the break in occurred during the spring hunt as we noticed that the cabins had also seen use since last year's operations. It appears that only a few items taken or used; 1 gallon of white gas (Coleman fuel) and 2 cans of bear spray, 100 ft of rope, and a fish landing net. However, the continued break-ins are causing significant non-repairable damage to the silo door, and the loss of supplies potentially represent a significant unnecessary increase in costs if additional flights are necessary to replace stolen items that are necessary for operations. At some point the damage will likely create a scenario where the crew will be unable to secure the silo at the close of banding operations. No regular gas remained at the camp at the close of 2014 banding operations.

X Trap storage has been relocated from cache point to the banding campsite, primarily due to continued erosion of the point during spring ice breakup. While adding additional setup time for transport this should extend the life of current traps if they can be enclosed or covered from the elements in future years.

High priority needs for 2015:

- This all
get
ordered?
Yes
1. USFWS/ENR should purchase a new or restock the medical kit at Willow Lake. The current one has been used or neglected over the years. The kit should include chemical cold packs to reduce swelling as ice is not readily available.
 2. Purchase and deliver 1814 kg (4000 lb) of barley on the winter road to Norman Wells during Jan–Feb 2015.
 3. Purchase and deliver 2–3 100' rolls of 18ga 1" x 2" wire to Norman Wells during Jan–Feb 2015.
 4. The silo door continues to be the weakest point of entry to the silo. The project should seek the fabrication of a custom door to increase the security of the door, and additional protection for locks.
 5. Construct new Benning B-2 traps and/or the round style with the supporting aluminum polls used at prairie stations.

Other Recommendations for 2015

1. Consider trapping in locations other than Willow Point in an attempt to meet stated banding objectives, and reduce avian and mammalian predator concentrations at Willow Point (e.g., out pockets in Loche River circa 1995 banding, North end of Willow Lake), conditional on water levels.

Table 1. Daily accounting of capture and banding at Willow Lake for 2014 operations.

Species																		
Trap Day	Date	American Green-winged teal		Blue-winged teal	American wigeon	Northern pintail	Mallard	Other Species	Number of Recaptures		New Bands/Day	Total Daily Catch	% Catch New Bands		Running Total of New Bands		Running Catch	Trap Nights
		winged teal	teal						Species	Recaptures			Bands	Catch	Bands	Catch		
1	10-Aug	1	10	0	0	1	0	0	0	0	12	12	100.00%	12	12	12	19	
2	11-Aug	51	0	0	3	5	0	2	59	2	61	96.72%	71	71	73	19		
3	12-Aug	0	1	1	2	9	0	1	13	1	14	92.86%	84	84	87	18		
4	13-Aug	1	0	0	1	0	6	0	8	0	8	100.00%	92	92	95	11		
5	14-Aug	0	0	0	0	0	0	0	0	0	0	0.00%	92	92	95	11		
6	15-Aug	10	0	3	38	5	0	2	56	2	58	96.55%	148	148	153	19		
7	16-Aug	12	0	22	52	27	0	7	113	7	120	94.17%	261	261	273	19		
8	17-Aug	2	1	21	28	43	0	7	95	7	102	93.14%	356	356	375	19		
9	18-Aug	1	0	9	36	83	0	15	129	15	144	89.58%	485	485	519	19		
10	19-Aug	1	0	11	17	73	0	20	102	20	122	83.61%	587	587	641	17		
11	20-Aug	1	0	11	59	55	0	19	126	19	145	86.90%	713	713	786	19		
12	21-Aug	0	0	10	50	60	0	30	120	30	150	80.00%	833	833	936	18		
13	22-Aug	0	0	5	66	72	0	55	143	55	198	72.22%	976	976	1134	19		
14	23-Aug	0	0	2	20	54	0	36	76	36	112	67.86%	1052	1052	1246	19		
15	24-Aug	0	0	1	18	50	0	57	69	57	126	54.76%	1121	1121	1372	19		
16	25-Aug	1	0	1	23	50	0	53	75	53	128	58.59%	1196	1196	1500	19		
17	26-Aug	0	0	3	6	24	0	50	33	50	83	39.76%	1229	1229	1583	18		
18	27-Aug	0	0	0	2	20	0	25	22	25	47	46.81%	1251	1251	1630	18		
Seasonal Totals		81	12	100	421	631	6	379						1251	1630	320		
Average/Day		4.50	0.67	5.56	23.39	35.06	0.33	21.06	69.50		90.56							

Accidentals & Rare Occurrences		
Date	Species	Number
8/13/2014	NSHO	6

Mortalities			
Date	Species	Number Banded	Cause
25-Aug	Mall	1	Yes
			Trap Death

Ageratios (young/adult) at catch		
Species	Ageratio	
AGWT	0.800	
AMMI	0.370	
NOPI	1.903	
MALL	0.186	

Table 2. Trapping Success Duck Banding at Willow Lake, NT, 1995 to 2014.

Year	Barley (lb)	Dates Trapped August	Maximum Number of Traps	Trap Nights (TN)	Number of Ducks Banded	Trapping Success (Ducks / TN)
1995	1500	2 to 21	7	119	509 ✓	4.3
1996	4500	9 to 30	17	195	1892 ✓	9.7
1997	3500	8 to 29	14	291	1687 ✓	5.8
1998	4000	13 to 30	16	262	1700 ✓	6.5
1999	5620	3 to 31	16	439	1248 ✓	2.8
2000	4463	3 to 30	18	490	1600 ✓	3.3
2001	3940	4 to 30	18	451	404 ✓	0.9
2002	6100	5 to 29	18	416	2168 ✓	5.2
2003	5061	6 to 30	18	423	1348 ✓	3.2
2004	4022	9 to 30	20	470	1298 ✓	2.8
2005	3030	8 to 30	13	293	1019 ✓	3.5
2006	3856	8 to 30	19	408	2083 ✓	5.1
2007	4022	12 to 30	18	324	374 ✓	1.2
2008	5126	13 to 1	20	398	1944 ✓	4.9
2009	3975	11 to 31	24	486	1549 ✓	3.2
2010				Station was not operated		
2011	3550	10 to 31	25	511	1674 ✓	3.2
2012				Station was not operated		
2013	2950	13 to 31	21	385	1137 ✓	3.0
2014	3150	11 to 27	19	320	1251 ✓	3.9
Mean	4020	2 to 31	18	379	1383 ✓	3.7

Richard
Popko

John
Biswell

Nelson

1898

4th best ever of 19 years

1,150 NOPI

531 MALL

129 AGWT

82 AMWI

4 BWTE

1 MALL/NOPI Hybrid