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Aleutian Canada Goose Transplant From Buldir Island to Amchitka Island, Aleutian Islands, Alaska Summer 1987

by
Greg T. McClellan

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Aleutian Canada Goose Transplant from Buldir Island to Amchitka Island, Aleutian Islands, Alaska--Summer 1987.

DATE

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AUTHOR(S)

Greg T. McClellan

CITATION

OBJECTIVE
Capture Aleutian Canada geese and transplant to Amchitka Island to continue efforts toward reestablishing a nesting population on Amchitka Island.

METHOD OF STUDY Geese were captured on Buldir Island by primarily searching the upper edge of the lowland tall plant association where tall plants offer cover and short plants in near uplands offer succulent food. After the geese were captured, they were sexed, aged and band with a numbered colored plastic leg band and size 7b FWS leg band. As soon as possible after capture, the birds were transported via the refuge vessel "Tiglax" and released at White House Cove, Amchitka Island.

MAIN FINDINGS A total of 136 geese were captured on Buldir. Of this number, 4 died in the transplant efforts. One bird died during transport and three died on Amchitka. The birds that died represented a three percent mortality factor for all the birds captured and transplanted. A total of 132 Aleutian Canada geese composed of 74 goslings and 59 adults (minus one bird, age unknown) were successfully transplanted and released on Amchitka Islan

CONCLUSIONS The capture and transplant of wild Aleutian Canada geese from Buldir Island is the most efficient method for reestablishing nesting populations of the sub-species on islands cleared of foxes (where the geese historically nested prior to the introduction of foxes near the turn of the century). Eleven nests were found on Agattu Island in 1985 proving the success of previous transplants to that island.

MANAGEMENT IMPLICATIONS Continuation of transplant efforts on Amchitka or other fox-free islands will lead to the reestablishment of nesting populations of this endangered sub-species on Amchitka and other islands and hopefully lead to this species eventual removal from the endangered species list.

ADDITIONAL REMARKS

UPDATES OR SUPERSEDES I.D. NO.

PROGRAM

FOR COPIES OF PUBLICATION OR REPORT CONTACT Refuge Manager, Aleutian Islands Unit-Alask Maritime National Wildlife Refuge, P.O. Box 5251, NAS Adak, FPO Seattle, Washington 98791

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ACKNOWLEDGEMENTS

Special appreciation is extended to the volunteer biologists for their assistance with the 1987 Aleutian Canada goose capture, banding and transplant efforts. Their enthusiastic and professional participation helped complete this project in a timely manner under difficult working conditions. Appreciation is extended to biological technician, Leslie Slater, for her helpful suggestions in all phases of the operation and her experience from past transplant operations. Thanks is extended to John Andrew and Lon Lauber for all their enthusiastic help with the operation. Thanks is extended to the "Tiglax" crew members for their assistance in our goose capture and transplant efforts. Appreciation is also extended to Evan Klett, AIU Acting Refuge Manager, and Dave Nysewander for editing this report.

INTRODUCTION

The U.S. Fish and Wildlife Service is attempting to reestablish the endangered Aleutian Canada goose (ACG) on selected historic nesting islands in the western portion of the Aleutian Chain that have been rendered fox-free (Figure 1). To accomplish this goal, hand-reared birds were formerly transplanted to some islands in hopes that they would reestablish nesting populations. This was not successful, as the birds had no knowledge of the migration route to the California wintering grounds nor a fear of avian predators and they subsequently perished. The next effort was to release a combination of hand-reared birds with wild birds from Buldir Island. It was hoped that the experienced wild adults transplanted from Buldir would serve as "guides" for their goslings and the hand-reared birds transplanted with them. The young of the year would then return to the island on which they first became capable of flight and establish new breeding populations. This combination of hand-reared and wild geese was used at Agattu in 1978, 1979, 1980 and 1982. Although many of the wild goslings returned to the island of their release, there was little success with the hand reared birds. Therefore, the release of hand-reared birds was discontinued following the 1982 transplant. The 1983, 1984, 1985 and 1987 transplants have been composed solely of wild birds captured at Buldir.

In 1985, wild adult and goslings from Buldir were transplanted to Amchitka Island after being transplanted to Agattu during the previous seven years with the exception of 1981. Previously, captive reared geese were unsuccessfully released on Amchitka in 1971, 1976 and 1980 with 75, 22 and 121 geese released respectively. In June of 1985 a crew of biologists documented 11 nests and a minimum population of 52 ACG on Agattu Island (Cantor and Sharpe 1985). It was felt that Agattu had a large enough population to sustain itself; thus, the decision was made to transplant geese to Amchitka Island beginning with the August 1985 transplant. A transplant effort was not conducted in 1986 due to a cut back in funds. The goal for the 1987 season was to capture and transplant a minimum of 100 geese from Buldir to Amchitka. During the capture and transplant operations, every effort was made to keep the family groups together, although this was not possible in all cases.

This year for the first year since 1979, biologists were stationed on the release island (Amchitka) during the transplant operation. In 1979, the biologists stayed on Agattu until the geese departed for the wintering grounds. This year the biologists were only able to stay on Amchitka until after the last release. ARM Dewhurst is permanently stationed on Amchitka and will be able to monitor the geese as time and other duties permit. In addition, two biologists are scheduled to be on Amchitka from 9 to 18 September to survey the island for ACG.

This year we also had two professional photographers with our crews on Buldir and Amchitka. They were able to document our capture activities with both 35 mm slides and some VHS video.

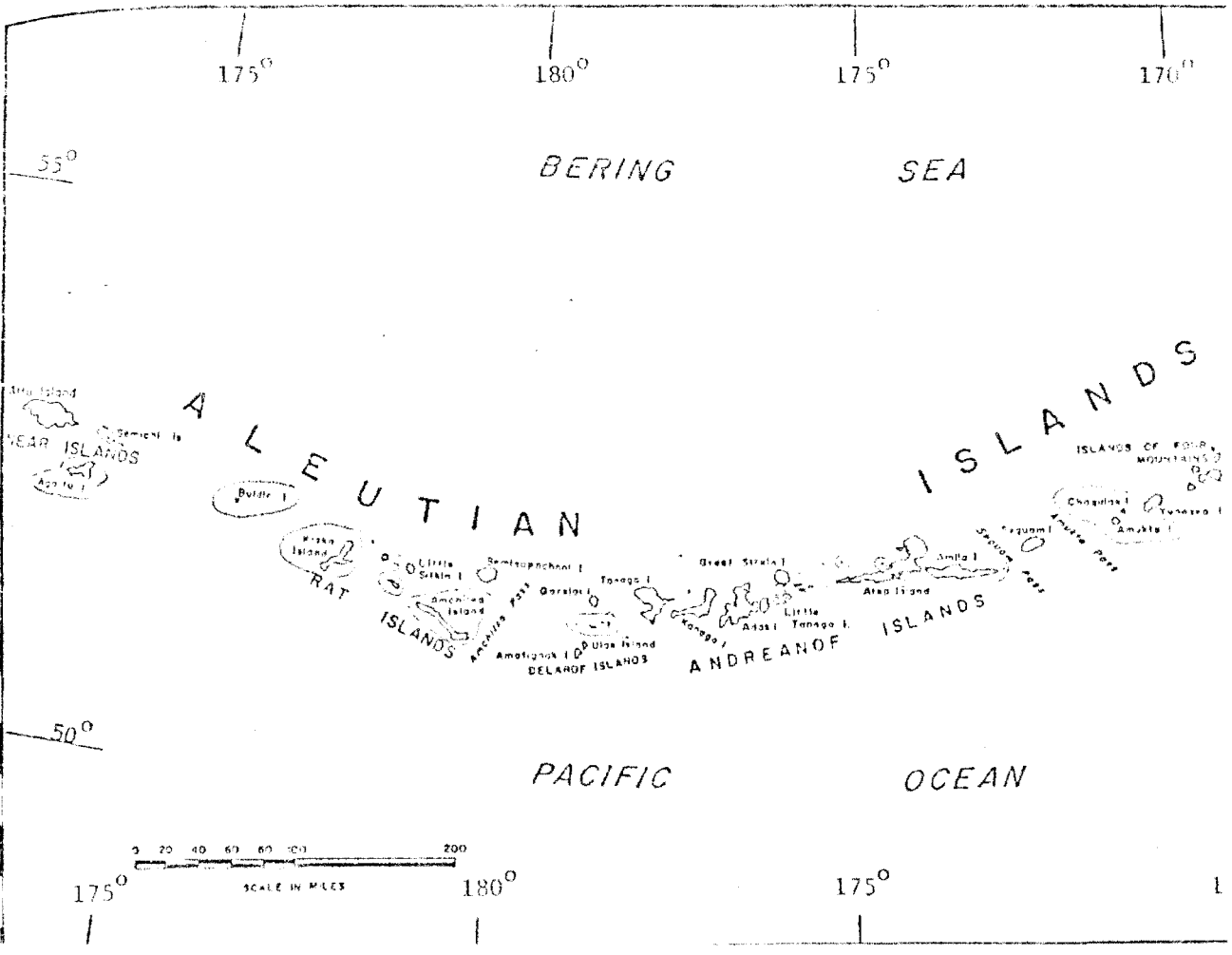


Figure 1. The Western and Central Aleutian Islands
(Circled islands are fox free)

Both photographers will be giving slides for use in Adak's and Homer's refuge slide files.

METHODS AND MATERIALS

Work was conducted on Buldir and Amchitka islands from 31 July to 10 August 1987. All personnel participated in the capture efforts of wild Aleutian Canada geese on Buldir Island prior to the first transplant run. After this first run, Dewhurst, Snyder and Gillham stayed on Amchitka. Snyder and Gillham camped at White House Cove (release site) to monitor the geese. ARM Dewhurst assisted with the transplant operations as her other duties on Amchitka permitted. The geese captured on Buldir were transported to Amchitka via the refuge vessel "Tiglax". Three transplant runs were made. Every effort was made throughout the capture and transplant operations to reduce the stress caused by handling, thereby increasing the birds' chances for survival.

Capturing the geese

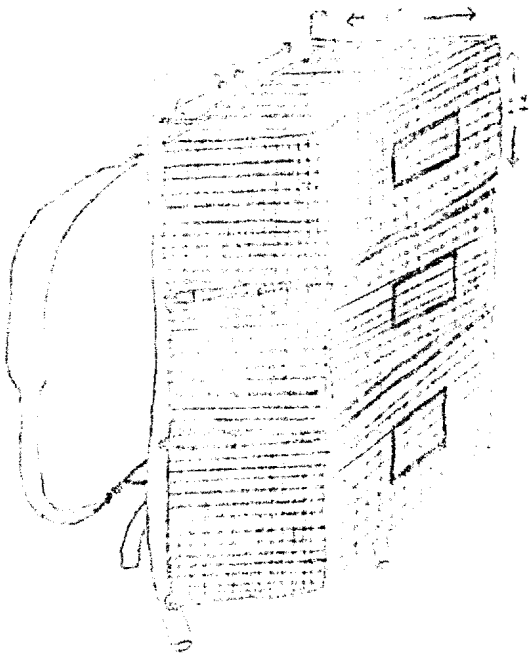
Methods used while searching/capturing for geese were based on information obtained during past work at Buldir. Byrd and Woolington (1978) indicated that most family groups could be found near the upper edge of the lowland tall plant association and the lower edge of the upland short plant association where tall plants offer cover and the short plants offer succulent forage. When searching for geese, only one person usually walked in the short plant community and the others walked at a slightly lower elevation in the tall plant community. Depending upon vegetation and topography, personnel usually walked abreast at about 5 to 15 m apart (Early and Henry 1979). Most geese were encountered in the tall plant community from near its upper edge to about 200 m down hill. A 1 m long by 1/2 m wide, long handled dip net was used to catch the geese in fairly even terrain with moderately short vegetation (Early and Henry 1979). The net helped prevent injury to birds during capture.

Usually when one goose was sighted others could be located in the same area. This occurred with non-breeders as well as family groups. It also became readily apparent that fresh goose droppings and clipped vegetation indicated geese were in the area. If no such sign was observed, very few if any geese were found (Early and Henry 1979).

Handling the Geese

Handling of the birds in the field was kept to an absolute minimum to help reduce the initial shock of capture. As soon as possible after capture, the geese were placed inside covered welded wire cages which were lined with fresh grass and plant material pulled at the site. The cages were composed of 1/2 inch or 1/4 inch square welded wire with three compartments (22x10x11 inches) stacked on top of each other and attached to a backpack frame (Figure 2). New cages of welded wire were built prior to the transplant operations following a recommendation by Deines (1985).

Figure 2. Aleutian Canada Goose Transport System



Note: Cages constructed of ¼ or ½ inch spuare welded wire lined with burlap on the outside and attached to a standard aluminum backpack frame.

The small square holes reduced the possibility of injury to the geese from getting feathers, bills or feet caught between the wires. In a break from past years, the geese were not placed in burlap bags before being placed inside the wire cages. This was done to reduce the possibility of injury to the geese from paralysis. In the bags, the geese had little freedom of leg movement causing the joints to be in one position for an extended period of time. By not putting the geese in the sacks, they had more freedom of leg movement. This also reduced handling of the geese. Prior to the 1984 transplant operation, the age and sex of the birds were determined and the bird was banded with a FWS band prior to being put into burlap bags. Since the 1985 transplant, fresh vegetation pulled from the ground has been placed in the cages prior to putting the geese in. It is felt that the native vegetation calms the geese down and makes the cage seem less threatening. The vegetation also provides padding between the wire and geese and also contributes with the outer covering to form a visual barrier. The geese also have the opportunity to either eat or just chew on the vegetation.

Only six geese (2 per compartment) were put into one backpack cage. In previous years, up to three goslings were put into one compartment. Backpacks were filled up one at a time. Goslings and adults were always separated in different compartments except for occassional situations where an older or large gosling was put with an adult. Unnecessary walking with birds in the packs was avoided. When additional areas were about to be worked for a time, any goose laden backpacks were set aside while crew members chased other geese. Likewise, if six geese were caught early, the full backpack was set down at the first convenient place and picked up on the way back to main camp. In a break from previous years, no geese were hand carried while walking back to main camp. If more than 6 geese per backpack were caught, the extra geese were released. Hiking back to camp was accomplished without unneccesary delays or rough treatment to the birds.

Upon return to the main camp at North Marsh, the backpacks were placed near the holding pen. In previous years, the geese were taken out of the backpacks and burlap bags and placed in wooden goose crates to await processing. To lessen the amount of handling, the geese were kept in the backpacks until processing and not put in the crates. The banding materials, tubing supplies and other equipment necessary for processing of the birds were then quickly gathered. Each person in the crew was reponsible for a specific task and a small assembly line type operation was established to process the geese. The age and sex of a bird was determined first, it was then banded with a metal FWS band and finally a yellow colored band was affixed . The FWS band was placed on the left leg of males and right leg of females, while the colored bands were placed on the right leg of males and left leg of females. All of this information along with the capture date and location was recorded in a field log (copy of field log in appendix).

All geese were then tube fed about 15cc of protein mixture (Table 1). The tube feeding continued once daily thereafter, including the day of transport. The birds were also tube fed just prior to release on Amchitka. The tube feeding of the geese helps reduce the shock of handling, increases their chances of survival, and insures success of the transplant (Forrest Lee pers. comm.).

The birds were then released into a fenced 5 x 15m enclosure built of metal fence posts and poultry wire. The enclosure included a poultry wire roof with burlap attached to the side walls as a visual barrier for the birds. The area within the enclosure provided natural food and cover. In previous years water and commercial goose feed were provided. The commercial goose feed stored at the cabin was not useable this year. There was also plenty of standing water in the holding pen so no water was provided. The band numbers of any birds which appeared to be suffering from paralysis due to the stress and shock of handling were recorded at that time.

Table 1. Goose Drink Solution

Ingredient	Small mix (1 qt.)	Large mix (1 gal.)
Prosobee	1-13 oz. can	4-13 oz. cans
Shaklee Protein Powder	2 tablespoons	8 tablespoons
Nutrical	2.5 tablespoons	10 tablespoons
Electrolyte Solution		
(electrolyte powder)	.75 tablespoon	3 tablespoons
(and water*)	13 ozs.	52 ozs.

*Note: Water can be measured in empty 13 oz. prosobee cans

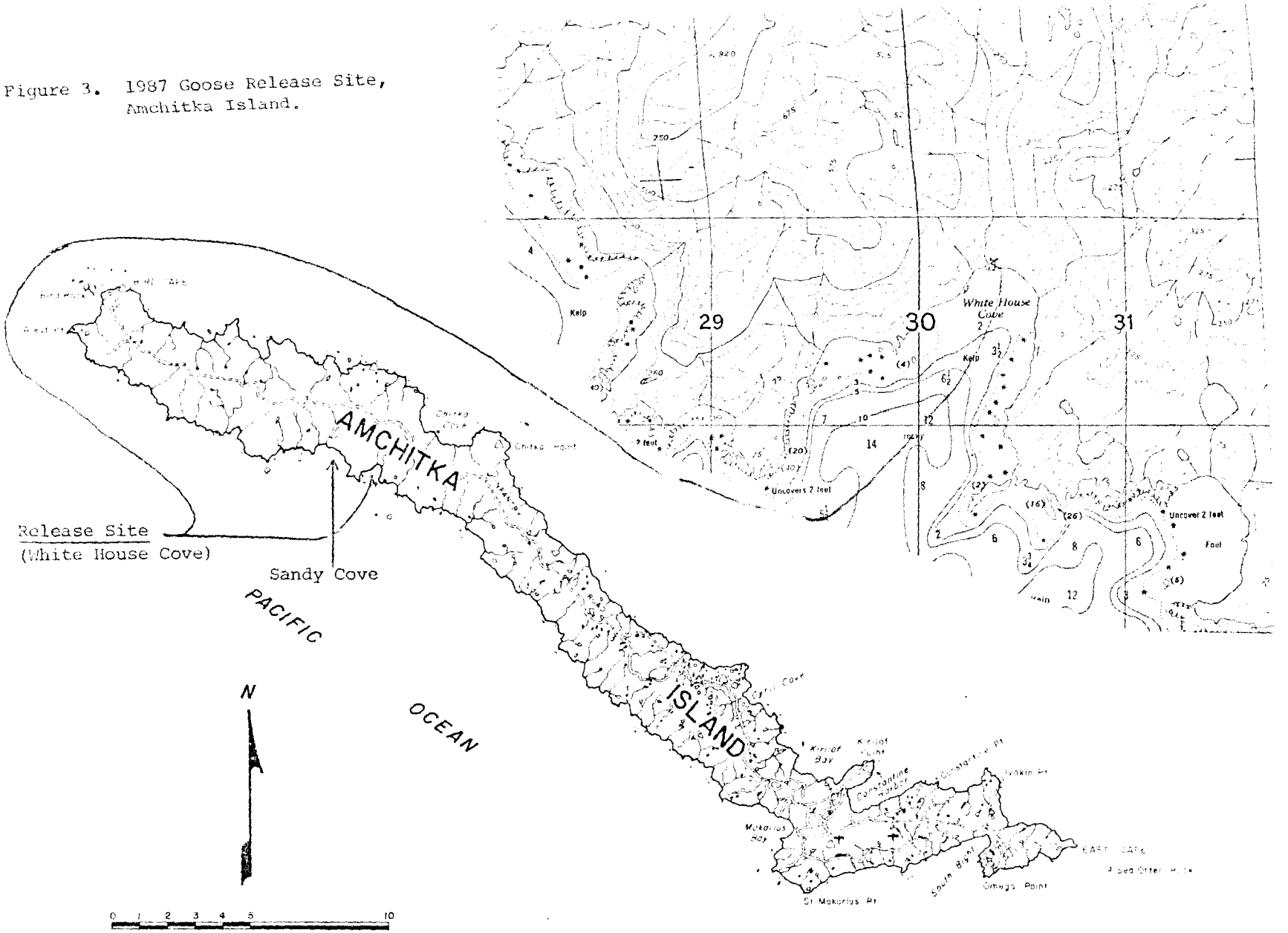
All geese were released into the holding pen after processing to recover from the stress unless the geese were being shipped out the same night that they were captured, in which case the geese were put into the holding crates immediately after being processed.

Geese were put in specially constructed wooden crates (35x10x16 inches) for transport to Amchitka. The crates were covered with burlap sacks and lined with fresh Elymus mollis and other vegetation. Adults and goslings were put into seperate crates to eliminate the potential of adult birds trampling younger ones during transport. The number of geese put into the crates was limited to up to 6 adults or 6 goslings to prevent injury.

Once the geese were placed in the crates, they were taken out to the vessel via a 4m inflatable boat powered by a 30 HP motor. The goose crates were put indoors in the wet lab on our new 40m refuge vessel, M/V "Tiglax". This provided complete protection to the geese from the weather. The door to the wet lab opened to the stern of the boat under the helipad. The door was kept open except in rough seas, thus the temperature in the room stayed cool. All efforts were made throughout handling of the goose crates to be as gentle as possible.

Upon arriving at Amchitka Island (timed to arrive in the morning or early afternoon), the geese were taken ashore via inflatable boats to the release site, White House Cove (Figure 3). The geese were taken out of the crates, tube fed and put into a non-permanent 3 x 8m holding pen. Geese were put into the holding pen for approximately 2 hours. Placement of the geese in the holding pen prior to release allowed the birds to re-establish family groups. The fenced holding pen was equipped with a visual barrier to enable the birds to settle down, form family groups and feed on the vegetation. After two hours the geese were released from the holding pen.

Figure 3. 1987 Goose Release Site, Amchitka Island.



The goose crates were used as a holding pen during the first release. Because of rough seas, the geese were transported to the release site overland by vehicle. The geese were tube fed and put back into the crates, which were set flat on the ground forming a circle. The geese were taken from the crates one at a time and put inside the circle. As the crate was emptied, it was put up on its side to form a higher visual barrier. The geese were kept in the circle of crates for one half hour and then released.

Observing the Geese

Two biologists were stationed on Amchitka from the first release to the final release. The biologists monitored the behavior of the geese as they were released from the holding pens and attempted to monitor the movement of the released birds. During the final two releases, the biologists stationed themselves at high points on each side of the valley. When released, the geese tended to walk up the slopes attempting to get to high elevation areas. The biologists attempted to deter this behavior by walking above the geese, forcing the geese down into the valley bottom into better cover and protection from eagles. The biologists monitored neighboring coves and areas via foot or from high spots with 10x40 binoculars and 25x spotting scopes.

RESULTS AND DISCUSSION

A total of 147 ACG were captured on Buldir Island. However, eleven geese were released either because the goslings were too young (7-21 days old) or the crew already had full backpacks (six geese per backpack). Thus, a total of 136 ACG were processed on Buldir (Table 2) and transplanted to Amchitka. Four birds died during the transplant. Of the four, one bird died during transport to Amchitka (yellow band #56) and three died after release on Amchitka. Two of the birds that died on Amchitka were thought to have been killed by eagles. One carcass composed of just the sternum and wing bones was found near an eagle nest. No bands were found near the carcass. The other carcass was found approximately 50 yards south of the first release site. The head and legs were intact but the rest of the carcass was just a mound of feathers. The carcass had yellow leg band #26. Number 26 was in the first transplant group and had shown paralysis when released. Gosling #94 was the final bird that died on Amchitka. It was a goose from the second transplant group and also showed paralysis when released. After release, the bird was found close to the pen hiding in tall vegetation. The bird was fed more tubing solution and put back into the pen. The goose was found dead in the pen approximately 4 hours later. Of the three carcasses with bands, two were goslings and one was an adult. The two goslings were males and the adult was a female. They represented a 3% mortality rate for all birds captured. In past transplant operations, mortality averaged 5.3%. The 1985 Buldir/Amchitka transplant mortality was 8% (Deines 1985).

A total of 132 Aleutian Canada geese were successfully transplanted to and released on Amchitka Island. This total, plus

Table 2. Results of Capture, Banding and Transplant Efforts on Aleutian Canada Geese from Buldir Island to Amchitka Island, 1987

Capture Date	Capture Location*	Transport Date	Number of Geese Captured and Banded			Mortality**				Number of Geese Successfully*** Transported to Amchitka		
						Buldir		Amchitka				
			AHY	LOC	Total	AHY	LOC	AHY	LOC	AHY	LOC	Total
8/2/85	A	8/2/85	25	23	48****	0	0	1	1	24	22	46
8/4/85	B	8/5/85	3	5	8*****	0	0	0	0	3	5	8
8/5/85	C	8/5/85	21	26	47******	0	0	0	1	21	25	46
8/7/85	D	8/9/85	7	9	16*******	0	0	0	0	7	9	16
8/8/85	E	8/9/85	4	13	17********	0	0	0	0	4	13	17
TOTAL			60	76	136	0	0	1	2	59	74	133

* A = Extra Plateau north
B = Bean Goose Lake
C = Extra Plateau east and south
D = South of Bean Goose Lake
E = On way to Tip Valley and Tip Valley

** Does not include the carcass (without head and legs) found near eagle nest on Amchitka
*** Includes the carcass (without head and legs) found near eagle nest on Amchitka
**** Includes one bird previously banded (blue leg band #C37)
***** Includes one bird previously banded (blue leg band #E55)
****** Includes two birds previously banded (FWS #997-14419 and blue leg band #C81)
******* Includes one bird previously banded (blue leg band #C80)
******** Includes one bird previously banded (red leg band #Z71)

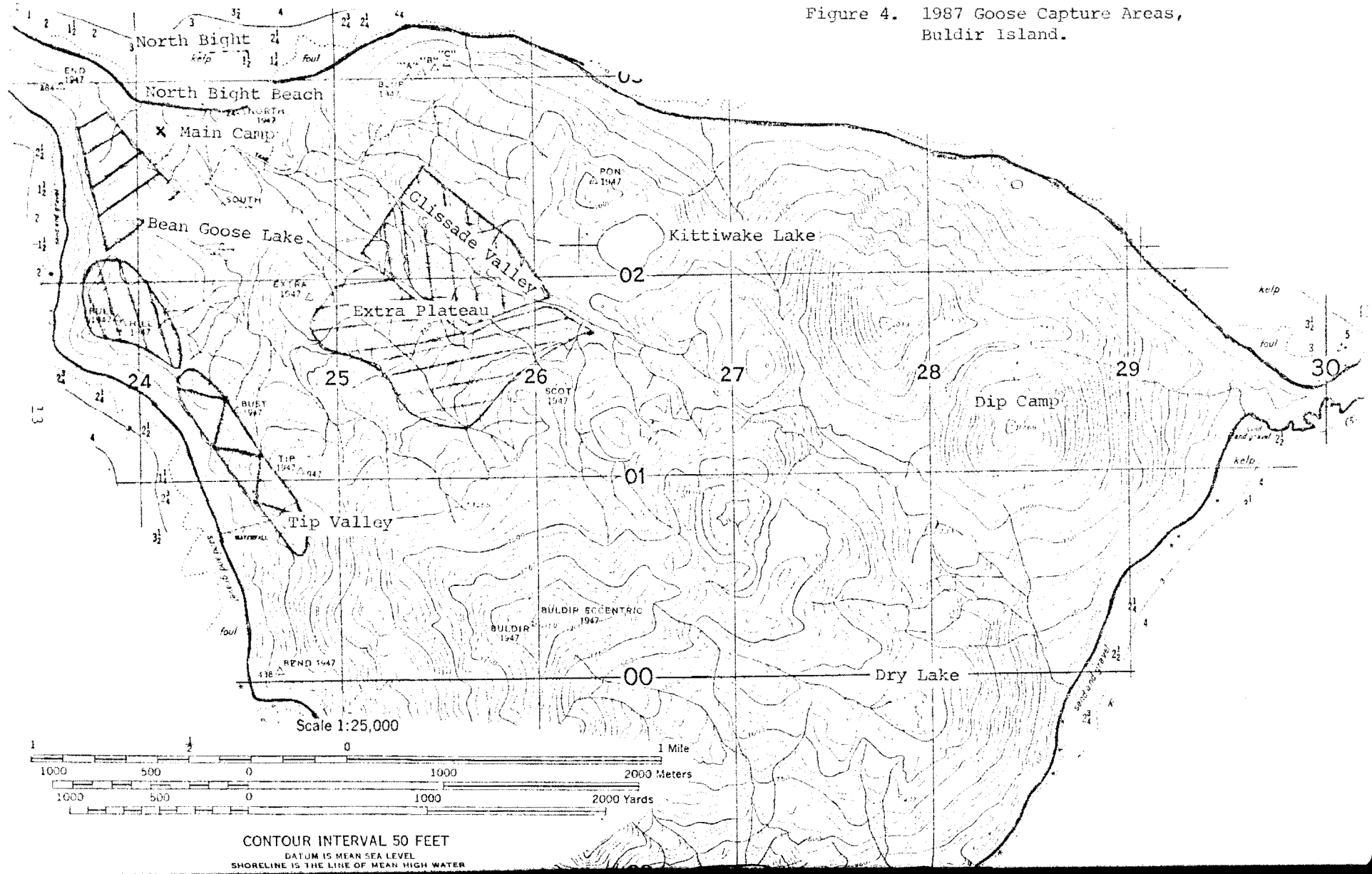
the unbanded goose caravan, was composed of 74 goslings and 59 adults (Table 8). The birds released on Amchitka included 40 male goslings, 34 female goslings, 22 male adults and 37 female adults.

Seven of the geese captured on Buldir were recaptures. Two of the recaptures were banded in California. One was an adult male with FWS band number 997-14419. The bird had no plastic band when caught (yellow plastic leg band B41 was placed on the bird). The goose was banded as a SY bird at Blitz Ranch, California in 1980, an old bird! The second California bird was an adult female with a red colored band numbered Z71 and FWS band numbered 1007-03120. It was banded on 8 April, 1986, as an after SY bird at the Lofton Ranch Pasture, Del Norte County, California. The next four recaptured birds were banded on Buldir and transplanted to Agattu in 1982, 1983 and 1984. An adult male (blue leg band C80, FWS band numbered 1127-04606) and an adult female (blue leg band C81, FWS band numbered 1127-04607) were banded on 30 July 1983. The third bird was an adult female when banded (blue leg band E55, FWS band numbered 1127-04697) on 31 July 1984. The fourth Agattu bird was a local female when banded (blue leg band C37, FWS band numbered 1127-01233) on 4 August 1982. The seventh bird was an adult female with yellow colored leg band A23 and FWS band numbered 1067-10407 and was banded as an AHY female on Buldir Island in 1985 and transplanted to Amchitka.

Initial capture efforts began on 2 August in the Glissade Valley and Extra Plateau area (Figure 4). Only one goose was captured in Glissade Valley compared to the 14 caught in 1985 (Deines 1985), but due to thick fog the capture team concentrated west of the creek bed rather than in the creek bed where most of the geese were captured in 1985. The capture team then went up to Extra Plateau and had excellent success with 53 geese captured. A young gosling (L-14) and an adult, yellow band A28, were caught together but released due to the young age of the gosling and to keep the family group together. Three other adults were released after capture to cut the total capture effort down to 48. With only 8 backpacks (six geese per backpack), a maximum of 48 geese could be captured and safely transported back to camp. To lessen the stress on the birds, it was recommended and agreed that no geese would be hand carried back to camp. The adults were released in an area where mostly adults were captured. Possibly, the adults would adopt any goslings we might have missed but had caught their parents. Upon reaching camp, the geese were processed and immediately put into the goose crates and transplanted to Amchitka via the "Tiglax". The birds were released on Amchitka via an overland route by vehicle on 4 August. Dewhurst, Snyder and Gillham went with the geese and monitored the releases on Amchitka Island.

The second capture effort began the afternoon of 4 August around Bean Goose Lake after the crew had completed putting walls, a floor and a roof on the cabin addition. The crew captured two geese around Bean Goose Lake and 6 more on the ridge northwest of Bean Goose Lake. The geese were taken back to camp, processed and

Figure 4. 1987 Goose Capture Areas, Buldir Island.



released into the holding pen. None of the geese showed signs of paralysis.

On 5 August, the capture crew headed toward Kittiwake Lake. As the crew passed through Glissade Valley, 6 geese (1 Ad, 5 goslings) were captured. However, considering the young age of the goslings (4,L-14 and 1,L-21), the whole family unit was released and the capture crew continued to Kittiwake Lake. As was the case in past years, Kittiwake Lake was very frustrating. Over 200 geese could be seen swimming in the middle of the fog shrouded lake, but we were completely unsuccessful in spooking the geese off the lake. A well planned system needs to be developed to move the geese off Kittiwake Lake. Since the northern portion of Extra Plateau was so successful on 2 August, the crew decided to give the untouched area another try. The eastern and southern areas of Extra Plateau were covered, and it was amazingly fruitful with 47 geese captured. The geese were immediately processed and put into the goose crates along with the geese captured on 4 August. The geese were transported to Amchitka via the "Tiglax" the evening of 5 August and released on Amchitka on the afternoon of 6 August.

Unfortunately, two people sustained leg injuries while chasing geese at Extra Plateau. Jim Fuller tripped over a hummock while chasing a goose downhill and sustained a painful knee injury. Jim's knee was examined by a med-tech on Amchitka Island and diagnosed as strained tendons. Bill Penning also tripped while chasing a goose downhill and twisted his knee. His glasses also flew off while he was tumbling down the hill. Even after an exhaustive 2 hour search by the capture team, the glasses could not be found. Both Jim and Bill accompanied the geese on the 2nd run to Amchitka to help with the tube feeding and release of the geese.

Extra Plateau was an amazingly productive area in 1987. A total of 95 geese were captured over two days and the whole area wasn't completely covered (Figure 4). With its relatively flat, rock-free terrain and close proximity to camp, Extra Plateau should be thoroughly searched for geese every year.

The capture crew was reduced to six people plus the two photographers after the second run with the geese. However, both photographers concentrated on helping with the capture of geese on the last two capture days. Their help was appreciated. The capture efforts on 7 and 8 August concentrated on the ridge next to the coast running between Bean Goose Lake and Tip Valley. A total of 16 geese were captured on 7 August before the crew was blown off the ridge tops by 40 knot winds with gusts up to 50 knots. The 16 geese were processed and released into the holding pen. None showed any sign of paralysis. Fifteen geese were captured on the way to Tip Valley and two in Tip Valley for a total of 17 geese captured on 8 August. Tip Valley was a very disappointing capture area. It is full of large boulders and is dangerous to work. A total of only 3 geese were observed in the valley. Two were caught while one flew away. The geese were taken back to camp and processed and put into the holding pen.

The geese captured on 7 August were tube fed also. Only gosling B-61 showed any signs of paralysis.

Camp was broken down and all gear loaded onto the "Tiglax" the morning of 9 August. The geese were tube fed prior to being put into the crates and hauled to the "Tiglax". The goose crates were the last items loaded onto the boat. The boat headed to Amchitka later that evening.

The boat arrived off White House Cove, at approximately 0900 on 10 August. The geese were ferried to shore, tube fed and then released into the holding pen. All the geese appeared to be doing fine. Two geese, B60 and B65, showed signs of paralysis but after two hours in the holding pen they appeared to improve. The holding pen on Amchitka was just a temporary pen approximatley 8 x 3m in size and made of excess wire from Buldir. Two people stayed near the pen to try and keep any geese from trying to escape. The rest of the crew were out of sight of the pen. One unidentified adult did escape by flying out of the pen, and it dissapeared out to sea in the fog.

The release went very smoothly. Amy Snyder and Martha Gillham stationed themselves at high points on each side of the valley running back up to the road. All other crew members hid out of sight except for the two photographers and one person to open the pen. The pen was opened but the geese were slow and hesitant to leave; however, once the first goose left, the geese steadily came out. The geese split into two groups with approximately 10 geese staying in the bottom of the valley while the rest headed up the valley splitting into two groups. Both groups tried to walk up the slopes to high elevation areas; however, Martha and other personnel stationed on the hillside tried to push the geese back down into the valley and tall vegetation. The system worked fairly well and most of the geese were amiable to staying in the valley bottom. Walking back to the beach, two adult eagles were observed circling and perched around the valley. Neither eagle attempted to dive on a goose. Amy Snyder observed one goose that appeared paralyzed and just sat hidden in the vegetation. The goose was an adult, but the band could not be read.

The second release on 6 August also went smoothly. The temporary pen was set up, the geese tube fed and released into the pen. Several eagles were observed in the area. An adult goose escaped from the pen and disappeared into the fog out at sea. The geese were left in the pen for approximately two hours to calm down and reform family groups. All personnel went back on the boat and headed back to Buldir except for Snyder and Gillham. Snyder and Gillham stayed hidden from the geese in the holding pen except when a goose tried to escape. Snyder went to her position on the west side of the valley while Gillham waited and then opened the pen. The geese slowly departed the pen in a large group. The goslings and adults were intermixed. Gillham stayed above the geese on the east side of the valley and tried to keep the geese heading down the valley rather than up the slope. The geese split into two main groups. Gillham followed the group heading up the

valley while the second group went up the slope to the east behind Gillham. An eagle was observed in the valley, but it was not observed swooping on any geese. At 1830, Gillham and Snyder walked back to the release pen. About 20 yards from the pen, two goslings, #34 and #94, were found hiding in the grass. Both geese appeared very weak and paralyzed. Gosling #34 was from the first release. Both goslings were tube fed 15cc of the tubing solution. At approximately 2200, #94 was found dead in the pen. Number 34 appeared strong.

The first goose release unfortunately did not run as smoothly as the last two. The boat left Buldir late in the evening on 2 August with the geese, Dewhurst, Gillham and Snyder aboard. The "Tiglax" arrived off Anchitka on 3 August only to be met by 16 foot seas. The boat was unable to off-load the geese and took shelter in Constantine Harbor, Anchitka. While tube feeding the geese, one bird (#56) was found dead and four geese did not look well. A discussion developed about our release options: wait out the storm and try to release the geese via inflatable boats at White House Cove, carry the geese overland via vehicle to the release site or release the geese somewhere on the east end of the island. The decision was made to release the geese overland via vehicle near White House Cove.

The geese were off-loaded from the boat at Constantine Harbor and put in vehicles at 0900 on 3 August. The vehicles arrived above White House Cove at approximately 1215. The crates were hauled approximately 1/3 of a mile down the valley from the road. The geese were tube fed a reduced amount of tubing solution due to the small amount that was left. The crates were arranged in a circle, laying flat. As the geese were released into the circle, the crates were turned on their side to form a taller pen and visual barrier. All the goslings were released first and they appeared hesitant to leave the crates. The goslings were left out 15 minutes, before the adults were released. Gosling #34 was paralyzed but mobile. The adults readily came out of the crates. In fact, the observers had to surround the crates to keep the adults in. Adult #26 showed signs of paralysis. One adult goose flew out of the circle and away. After 30 minutes, several adults broke through the crates and the rest of the geese were released. All the geese, hurried up the slope toward the road, with the adults as a group in front and the goslings as a group bringing up the rear. The geese raced up to the road with some heading over the road down the other side while other geese ran to the hills along the road. The observers had a hard time trying to follow the geese. Five bald eagles and 2 peregrine falcons were observed in the area. Two different eagles swooped down on the group of goslings but both appeared unsuccessful. Gosling # 34 was unable to move very well and was kept in the pen. An attempt to release gosling # 34 with the 2nd goose release was also unsuccessful. Adult # 26 was able to move slowly and hobbled over to the stream near the pen and was last seen swimming down the creek.

During their stay, Gillham and Snyder searched the White House Cove and neighboring areas for any geese, but were unsuccessful. They searched neighboring areas and coves from high points with 10x40 binoculars and 25x spotting scopes. On 6 August, goose # 26 was found dead about 50 yards south of the goose crate release site near the stream. It appeared to be an eagle kill. The morning of 8 August was very stormy. The holding pen was damaged. Snyder and Gillham looked for gosling #34 but couldn't find him. Apparently, the gosling had escaped. On 8 August Gillham and Snyder checked out an eagle aerie near the ridge west of White House Cove. Two adults and one immature eagle were observed on or near the nest. In a small pool below the nest, the remains of a goose's body and wing bones with no head or leg bones were found. On 9 August, the coastlines west and east of White House Cove were checked with no geese being observed.

Although Snyder and Gillham were unsuccessful in resighting any of the released birds, their presence was still very helpful. The documentation of geese trying to go up in elevation (even if cover is lacking there) following release from the pen is useful information. Buldir is a unique island with abundant tall vegetation at high elevation. However on both Amchitka and Kiska, the tall vegetation is restricted to the coastline and stream drainages. The habitat of the higher elevations on Amchitka and Kiska is short tundra. Snyder and Gillham also found the three goose carcasses which proably would not have been found if people hadn't been there. Documenting mortality is very important. It is also advantageous to have people at the release site waiting for the geese and helping with the landings.

Even though most geese encountered at Buldir were incapable of flight, flightless birds were still able to move quite rapidly over the rough island terrain. Every day's effort found that some geese were able to outrun the crew in open areas, especially if headed uphill in short vegetation. On most of these occasions, the capture crew was spotted by wary geese before the crew saw them. The only view the crew had of these birds was one of them proceeding out of the area with all expediency. The birds were impossible to overtake after such a headstart. Our efforts to circle ahead of them also proved fruitless. Our capture efforts were most successful when we searched the zone where the tall vegetation (Elymus-umbel) gave way to the short vegetation (mossy-willow).

The overall age of goslings at capture was 34.62 days (Table 3). By counting back 34 days from 5 August one can deduce that the peak of the hatch was about 2 July. By counting back an additional 27 days from 2 July, one could conclude that the peak of incubation initiated on 5 June. By counting back an additional 7 days one could estimate that the majority of egg laying began on 29 May. The first week in June has always been considered the time when the majority of incubation begins at Buldir. The average age for birds captured in 1985 was 38 days (Deines 1985), 33.5 days in 1984 (Deines 1984), and 27.5 days in 1983 (Deines and Zeillemaker 1983).

Table 3. Estimated Age of Goslings Captured, Banded and Transplanted to Anchitka.

	Colored Leg Band Number	Capture Location	Date of Capture	Estimated Age on Date Captured	Adj. Est. of Age in Days at Time of Final Transplant
1.	33	Extra Plateau North	8/2/87	28	36
2.	34	"	"	35	43
3.	35	"	"	42	50
4.	36	"	"	42	50
5.	38	"	"	42	50
6.	39	"	"	28	35
7.	40	"	"	21	29
8.	42	"	"	21	29
9.	43	"	"	21	29
10.	49	"	"	35	43
11.	50	"	"	42	50
12.	52	"	"	28	36
13.	54	"	"	21	29
14.	55	"	"	28	36
15.	57	"	"	21	29
16.	59	"	"	35	43
17.	63	"	"	21	29
18.	65	"	"	28	36
19.	68	"	"	21	29
20.	69	"	"	35	43
21.	71	"	"	35	43
22.	73	"	"	35	43
23.	74	Bean Goose Lake	8/4/87	21	27
24.	75	"	"	28	34
25.	76	"	"	21	27
26.	79	"	"	28	34
27.	80	"	"	28	34
28.	85	Extra Plateau East & South	8/5/87	42	47
29.	86	"	"	35	40
30.	87	"	"	42	47
31.	88	"	"	42	47
32.	89	"	"	42	47
33.	90	"	"	49	54
34.	91	"	"	42	47
35.	92	"	"	49	54
36.	93	"	"	35	40
37.	95	"	"	42	47
38.	96	"	"	35	40
39.	P37	Extra Plateau East & South	"	42	47

	Colored Leg Band Number	Capture Location	Date of Capture	Estimated Age on Date Captured	Adj. Est. of Age in Days at Time of Final Transplant
40.	B38	Extra Plateau East & South	8/5/87	35	40
41.	B44	"	"	28	33
42.	B45	"	"	35	40
43.	B48	"	"	21	26
44.	B49	"	"	21	26
45.	B50	"	"	35	40
46.	B51	"	"	42	47
47.	B52	"	"	21	26
48.	B53	"	"	21	26
49.	B54	"	"	28	33
50.	B55	"	"	28	33
51.	B57	"	"	42	47
52.	B58	"	"	21	26
53.	B63	South of Bean Goose Lake	8/7/87	42	45
54.	B64	"	"	42	45
55.	B67	"	"	49	52
56.	B68	"	"	49	52
57.	B69	"	"	49	52
58.	B70	"	"	28	31
59.	B71	"	"	49	52
60.	B72	"	"	49	52
61.	B75	"	"	35	38
62.	B76	Tip Valley	8/8/87	35	37
63.	B78	On way to Tip Valley	"	49	51
64.	B79	"	"	42	44
65.	B80	"	"	35	37
66.	B81	"	"	35	37
67.	B82	"	"	35	37
68.	B83	"	"	42	44
69.	B86	"	"	28	30
70.	B87	"	"	35	37
71.	B88	"	"	42	44
72.	B89	"	"	42	44
73.	B90	"	"	42	44
74.	B91	"	"	42	44

Although every effort was made to minimize the impact of capture and handling on the birds, some geese still showed signs of partial stress paralysis when they were released into the holding pens on Buldir or Amchitka (Table 4). A few birds sustained some minor abrasion injuries during the handling and transport. These injuries were treated by spraying the affected areas with antiseptic.

Table 4. Geese Exhibiting some Paralysis at Time of Release.

Band No.	Capture Location	Age	Sex	Injury
26	Extra Plateau North	AHY	F	Some paralysis
34	Extra Plateau North	L35	M	Some paralysis
94	Extra Plateau South	L28	M	Some paralysis
B60	Southeast of Bean Goose	AHY	M	Some paralysis
B65	Southeast of Bean Goose	AHY	M	Some paralysis
B81	Northwest of Tip Valley	L35	F	Some paralysis

In total, 6 geese were positively identified to be affected by paralysis at either Buldir or Amchitka. Only one bird, B81, showed signs of paralysis on Buldir. The other 5 birds showed sign of paralysis in the holding pens at Amchitka. Gosling #34 and adult #26 were transported on the first run. Gosling #94 was transported on the second run while B60 and B65 were transported on the final run. In addition, 4 birds showed signs of stress while being tube fed aboard the "Tiglax" on 3 August. However, no band numbers were recorded.

The low incidence of paralysis this year may be attributed to the closeness of the capture areas, new backpacks or the reduced time for the "Tiglax" to make the transport run compared to the charter vessel used in 1985. The farthest capture area was the east end of Extra Plateau approximately 1-1/2 miles from camp. New goose backpacks were built and used during the transplant. The compartments were 1 to 3 inches larger in all dimensions than the ones used previously. Also, only two geese were put in each compartment where in previous years three smaller and/or younger goslings may have been put in one compartment. This year we also did not use burlap bags to put the geese in while carrying the geese in the backpack. The bags restricted the ability of the geese to move their legs. With the larger backpack compartments and other improvements the geese were given more room and freedom of movement. With the improved speed of the "Tiglax", the geese had to spend a shorter time (4-5 hours) in transport compared to 1985. All these improvements may have helped to reduce the susceptibility of paralysis on the geese.

All geese captured and banded on Buldir were transplanted to Amchitka as quickly as possible and the weather permitted. This is considered an important factor in possibly reducing stress/paralysis and mortality of the birds during the transplant operation. Ninety-five (69.3%) geese were transported the same evening they were captured. Of these 95, 47 (49.4%) were transplanted to Amchitka within 17 hours while the remaining 48

(49.6%) were transplanted to Amchitka within 41 hours. The release of the 48 geese was delayed by the weather. Of the remaining 41 geese, 17 geese were transplanted within 41 hours, 8 geese were transplanted within 65 hours and the final 16 geese were transplanted to Amchitka within 67 hours.

To help reduce the stress of capture, handling and transplant, the project is scheduled to allow capture of older goslings. Goslings of the 45 day age class probably transplant more successfully as they are near the end of their rapid growth and development period (Forrest Lee pers. comm.). The 1987 average gosling age of 34.62 days indicates that the capture effort may have been slightly early. It would have been best had the capture effort centered around 14 August. It should be noted, however, that such a late date may have met worse weather, and a later date in another year might have been too late. It is probably best if transplant efforts span two weeks, as in past years, to allow bracketing of the time frame when most goslings are 45 days old. The gathering of information on the age of goslings and paralysis was begun in 1983. Both efforts should continue each year to help make future capture efforts more efficient and less stressful on the birds.

A concern was raised this year about the stress that geese undergo when they are sexed. It appears to be a very traumatic experience on the geese. Often, the geese put up a strong struggle with their legs to escape from the sexer. Is it possible that this struggle with their legs may trigger or increase the chances of leg paralysis? The peeling back of the cloaca with our fingers may cause some slight bleeding. This was especiaaly noticed on the adult birds. Sexing of the goslings appeared to go more smoothly and be less stressful than the sexing process on the adults. It may be adventageous to just sex the goslings and not the adults. However, there seems to be a correlation between the sex of the bird and its likelihood to incur paralysis with males more prone than females to incur the paralysis. Deines (1984 and 1985) reported from the 1984 and 1985 transplants that 64% and 61% of the paralyzed birds respectively were males. It would be advantageous to keep recording this sex information.

A copy of the banding schedule, incidental bird nesting phenology observations, incidental bird and mammal observations and weather data are contained in the appendix. Three pelagic seabird transects were conducted west of Amchitka on 30 July. Copies of the data sheets are contained in the appendix.

RECOMMENDATIONS

1. There should be enough flexibility in the vessel schedule so that bad weather, repairs, or any other delays will not impact the transplant operation at Buldir.

2. The timing of the capture effort should be centered as best as possible so as to concentrate on goslings 45 days of age.

3. The capture, banding and transplant effort on Buldir should be two weeks in length (as in past years).

4. The minimum number of goose capture personnel should be eight. Any fewer is less efficient. Ten people are considered optimal, as two people must accompany the vessel during the transplant operations away from Buldir.

5. The backpack compartments should be lined with fresh vegetation pulled at the site of capture. This seems to calm the geese down and also acts as extra padding from the wire compartments.

6. Only 6 geese (2 per compartment) should be carried in any one backpack to allow the geese sufficient room while being transported back to camp. No geese should be hand carried back to camp, this should reduce stress from handling. If there isn't enough space in the backpack for the geese, the extra geese should be let go.

7. The minimum age of goslings to be transplanted should be older then 21 days to increase the chances of the goslings survivability.

8. To lessen the shock of capture, the geese should be immediately placed in the backpacks. All additional handling (such as sexing, aging, banding and tube feeding) should be done back at the base camp.

9. A discussion by the ACC recovery team members should be conducted on the merits of sexing the geese. Sexing appeared to be one of the most traumatic experiences that the geese were put through. If we did not sex the geese, the amount of handling and stress they would have to undergo would be greatly reduced. If we continue sexing the geese, then all field personnel should undergo a training session prior to the 1988 transplant.

10. The burlap goose carrying bags should not be used in conjuction with the backpacks in order to reduce handling and stress.

11. With the excellent results obtained during the 1987 transplant, the entire Extra Plateau area should be thoroughly searched for geese.

12. The problem of how to get the geese off Kittiwake Lake should be well thought out and a solution proposed (i.e., stretch fishing line with plastic bobbers every ten feet across the lake to force the geese out of the lake into the capture team). These geese would be especially desirable for transplants since they appeared to be older goslings and adults.

13. The use of long handled nets should be considered mandatory. Their use helps prevent injury to the birds during capture.

14. Capture participants should be instructed to work together as a team whenever appropriate and down play competition toward personally capturing the most birds. Knee injuries have resulted in the past during capture operations.

15. Areas of dense vegetation and numerous large rocks, boulders, uneven terrain, or other features making footing difficult, should be avoided to reduce chances of injury to capture personnel.

16. The geese should be tube fed daily beginning the day of capture and every day thereafter including the day of transport and just prior to release. Geese suffering from paralytic shock should receive additional tube feeding, if possible.

17. Enough tubing solution or the ingredients needed to make it should be taken on each transport run so a sufficient amount will be on hand to feed the geese their recommended daily dosage if the boat should get weathered in for a day or two.

18. Whistles should be carried and used by all personnel involved in goose capture to help flush the birds out of dense vegetation.

19. A double wrap of burlap material 36" high should be placed around the holding pens at Buldir and Amchitka each year to provide visual barriers to the geese and reduce injury.

20. When the holding pens on Buldir and Amchitka are not in use, both ends should be left open to prevent them from becoming traps to other wildlife thoughout the year.

21. Roofing material (tar paper and tar) to cover the roof on the new cabin addition and also repair the old cabin roof should be brought along with the necessary tools.

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