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REDUCING CONFLICTS BETWEEN SNOW GOOSE HUNTERS AND WHOOPING CRANES AT BOSQUE DEL APACHE NATIONAL WILDLIFE REFUGE

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Abstract: The Bosque snow goose (*Chen caerulescens*) hunt was initiated in 1966 and had become an important recreational hunt by 1975, when the experimental whooping crane (*Grus americana*) foster parent program was initiated. Since 16 sandhill cranes (*G. canadensis*) had been mistakenly shot prior to the program, concern was that whooping cranes might also be shot. The Bosque Snow Goose Hunter Training Program was initiated in 1977, consisting of a 1-hour slide/tape presentation and a 10-minute bird identification test. Modifications to hunt procedures and the requirement of all hunters to attend the hunter training program resulted in zero shooting incidents regarding whooping cranes in a 12-year period. Only 4 incidents were recorded regarding other non-target species violations in the same period.

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Snow geese are hunted on Bosque del Apache National Wildlife Refuge in the presence of whooping cranes. Although many other federal refuges permit snow goose hunting, none allows hunts where the target species so much resembles the protected species.

Numerous incidents had occurred during the refuge goose hunt prior to initiation of the whooping crane foster parent program in 1975 in which hunters had either shot or attempted to shoot protected sandhill cranes (*Grus canadensis*). The primary target protected sandhill cranes (*Grus canadensis*). The primary target species during the early phases of the hunt was the Canada goose (*Branta canadensis*). Of considerable concern then, was that if hunters had trouble distinguishing a Canada goose from a sandhill crane they may likewise be unable to differentiate between a snow goose and a whooping crane. Out of that concern, the U.S. Fish and Wildlife Service developed a program to reduce conflicts between hunters and whooping cranes. It also necessitated many changes in administering the Bosque snow goose hunt.

The purpose of this paper is to present an overview of that snow goose hunter training program and changes in hunt management that were developed to protect the experimental whooping crane flock.

HISTORY OF THE BOSQUE SNOW GOOSE HUNT

In 1965, an experimental goose hunt was held on the refuge, open to Canada goose hunting only. In 1966 the hunt was expanded to include snow geese, Ross' geese (*Chen Rossii*) and white-fronted geese (*Anser albifrons*). From 1966 to 1967 the most numerous harvested species was the Canada goose, but by 1969, Canada geese had declined to such a point that the dark goose (including white-fronted geese), hunting season was closed. It has remained closed through 1988 (Table 1).

As the Canada goose population was decreasing, snow geese were increasing (Table 2). The snow goose was an infrequent if not rare visitor when the refuge was established in 1939, but a small group of birds began wintering there in the late 1940's, reaching 188 in 1951. By 1961 the population had grown to 1043, and increased steadily to 8020 in 1972 and doubled to 16,000 the following year. In 1986, the number peaked at 56,800.

The Bosque snow goose hunt had become an important recreational hunt by 1975. The snow goose population in the Middle Rio Grande Valley was essentially confined to the refuge and there was little opportunity for harvest off the refuge.

The National Audubon Society objected to the 1975 hunt because of its threat to whooping cranes, but the hunt was continued on the basis that a primary objective of the whooping crane introduc-

tion experiment which was "...to ascertain the feasibility of introducing whooping cranes into these areas without seriously disrupting current resource uses, particularly waterfowl hunting."

The hunt was challenged once more in 1982, when language was inserted into the Department of Interior's annual appropriations bill which required "...no funds be used to plan for, conduct or supervise hunting on the Bosque when whooping cranes are on the refuge." But the bill was amended to delete language, and the hunt continued.

MANAGEMENT OF THE BOSQUE GOOSE HUNT

The first goose hunt extended from 4 December 1965 to 26 December 1965 and from 1 January 1966 through 9 January 1966. The hunt area was split into Unit A and Unit B (Fig.1), with Unit A consisting of approximately 4700 acres and was open to unrestricted hunter access.

Unit B consisted of 1300 acres and was managed as a controlled hunt. Hunters were selected by drawing and were required to hunt from 1 of 20 blinds. They were also required to check in and out of the hunt area via a check station, and could only hunt from sunrise to noon. The unit was open to hunting on Tuesdays, Thursdays and Saturdays, and hunters were only allowed 5 shells to discourage "sky busting." The daily bag limit was 1 goose.

Although the hunt was controlled, the hunters were not required to attend any pre-hunting training. One person was apprehended who attempted to shoot a sandhill crane.

The 1965 hunt attracted 325 hunters to Unit B, but in 1966 the number of hunters was 967. Hunt management changed very little except that a flyer was distributed which depicted the difference between geese and sandhill cranes (Fig. 2). The effectiveness of the flyer is unclear, there were 5 cases of sandhill cranes being illegally shot and 4 cases of attempts to shoot subsequent to distribution of the flyer.

Hunt Management changed little in 1967 and 1968. Sandhill crane hunting violations consisted of 3 cranes being shot in 1967 and 6 in 1968. Unit A was closed to goose hunting in 1969, but no other significant changes occurred. This was the first year since the goose hunt was established that no hunting violations involving sandhill cranes occurred. The same was true in 1970, but in 1971, 2 sandhills were shot.

No violations occurred between 1971 and 1975. The most notable change in hunt management

during this period was the requirement to use steel shot, instituted in 1971.

The 1975 Hunt

Many of the pre-1975 hunt procedures were retained in 1975. The hunt area was not changed, nor was the blind selection process. Major modifications were made, however, in relation to how the hunt was conducted and a pre-hunt orientation was added.

All hunters were required to attend a 15-minute briefing session before the hunt began. Mounted specimens of sandhill cranes, snow geese and white-fronted geese were used to point out the difference between the species. The maximum fine for shooting a whooping crane was pointed out and the hunt procedures were explained.

The pre-hunt orientation was preceded by an intensive public awareness effort which had begun several months before the hunt. Television, radio and newspapers were used to make people aware of the Foster Parent Program, and to describe a whooping crane. Leaflets, posters and other information were distributed to sporting goods outlets, hunters, local schools and the general public.

During the hunt, observers were situated in strategic locations to observe whooping crane movements. Once a whooping crane left a roost site it was "walked through" the hunt area via 2-way radio communication among observers until it had passed the hunt area. If the bird left the refuge, a federal wildlife agent would then be made aware of its location.

If a whooping crane entered the hunt area, a system of sirens was used to warn hunters to cease hunting. Hunters were required to leave their blinds and lay down their guns until the bird left the area. During the 1975 hunt, such occurred 32 times.

The previous hunt hours of sunrise to noon were replaced by sunrise to 10:00 a.m., because the best hunting hours proved to be before 10:00 a.m. and it was believed that some hunters may be tempted to shoot at non-target species between 10:00 and noon, or birds out of range because of boredom. Also, most cranes did not leave roost areas until after 10:00 a.m., which lessened the opportunity of shooting a whooping crane.

In 1975, 2 whooping cranes wintered at Bosque, and the hunt was completed with neither being threatened or injured. The system did not solve every problem, however, 5 sandhill cranes were shot during the hunt (no special precautions being

taken to protect sandhill cranes).

Hunt Modifications: 1976-1988

The siren system was used again in 1976, but several people involved with hunt management favored a hunter-training program over sirens, reasoning that such could be used effectively to protect all non-target species and not just whooping cranes.

Hunt dates were moved back 2 weeks in 1976 to lessen disturbance to feeding cranes during December. The hunt area was moved farther south in 1977, opening up a feeding area within the refuge boundary for displaced whooping and sandhill cranes.

The Bosque Snow Goose Hunter Training Program was initiated in 1977, and the siren warning system was replaced with a portable radio warning system. Each blind was issued a portable short-range AM radio for warning hunters when whooping cranes entered the hunt area.

No major changes in hunt management were effected between 1978 and 1982, but in 1983 evidence was presented suggesting that whooping cranes were being dispersed off the refuge during hunt periods (Table 3). The 1984/85 hunt was therefore changed to when most whooping cranes had migrated north — from 13 February 1984 through 28 February 1984.

In 1985, 8 days of the 16-day hunt were held in the southern marsh unit. Two objectives for the marsh hunt were to help disperse some of the early snow goose migrants southward and to reduce conflicts between hunters and whooping cranes. The marsh hunt was held in November (most cranes do not arrive at Bosque until late November or early December). Shooting times were changed to between 10:30 a.m. and 2:30 p.m. when most cranes were gone from the marsh to feed.

The 1986 and 1987, hunts were conducted for 16 days in the marsh units. The 1986 hunt was part of a complex program to disperse a portion of the early snow goose population southward to Mexico. The 1987 hunt was continued in the marsh during November to lessen whooping crane disturbance later in the year.

DEVELOPMENT OF THE BOSQUE SNOW GOOSE HUNTER TRAINING PROGRAM

During the first 2 years of the intensively man-

aged snow goose hunt (1975 and 1976) refuge staff were responsible for preventing a shooting incident with a whooping crane. A hunter training program, however, was initiated to shift a large portion of the responsibility to hunters. The following objectives were inherent in the program:

1. Improve bird identification (thus prevent taking of non-target species).
2. Develop more effective goose hunters.
3. Increase the harvest of snow geese.
4. Improve hunter ethics.
5. Familiarize hunters with regulations.
6. Orientation on whooping crane transplant program.

All prospective hunters, both selected and standby, were required to attend the 1 1/2 hour program. Hunters were made aware through the media and on the hunt application that attendance was mandatory and were notified as to where and when the training was being given when selected for the hunt. Programs were given in Albuquerque, Santa Fe and Socorro, and hunters were given a certification card after passing the identification portion of the test. Anyone failing the test was required to retake it until they passed it, but that was changed in subsequent years and hunters were not permitted to retake the test during the year they had failed. The change was necessary to reduce the number of people being tested, since some training sessions contained 300 participants or more. The training was at first considered to be a one-time requirement which would serve for future years, but that was changed also, requiring hunters to renew their certification every 2 years.

Program Content

The program consisted of a 1 hour slide/tape presentation and a 10 minute bird identification test. The tape program included a story of the expanding snow goose population in New Mexico, information on the Grays Lake foster parent experiment with whooping cranes, a section on identification of bird species common to the Bosque Refuge with emphasis on differentiating cranes from snow geese, and information on the regulations and check-in procedure. Bird identification slides included close-ups, group, and in-flight photographs of all target and non-target species.

Identification Test

The identification test consisted of 25 views of flying birds much like a hunter would see them in a hunting situation. The hunter test card was divided into two possible answers of "shoot" or "don't shoot." Participants were allowed to miss up to 5 answers, except that they could not pass if they answered "shoot" to a whooping crane question. If a non-target species appeared with a target species in the same view, it was considered a "don't shoot" situation. The only "shoot" situation was when 1 or more birds of the target species was seen in a single view.

Hunter Response to Required Program

Most hunters responded favorably to the training program during the first few years. Many did not favor having to retake the program every 2 years, but this was necessary to bring them up to date on rule changes and regulations. In 1986, we compromised and allowed hunters to wait 3 years before retaking the test.

Hunt Costs, Including Training Program 1976-1987

Hunt costs varied from a high of \$21,199.00 in 1976 to a low of \$5,500.00 in 1986 (Table 4). Lower hunt costs in 1986 were due to fewer staff being required to conduct the marsh hunt.

Effectiveness of Hunt Management Modifications and the Hunter Training Program in Protecting Non-target Species

The rigidly controlled Bosque snow goose hunt, coupled with the Snow Goose Hunter Training Program, has resulted in successfully protecting whooping cranes at Bosque Refuge. Although 1 hunter was apprehended after shooting at 2 whooping cranes outside the refuge boundary in 1977, no cases have occurred inside.

Sandhill crane hunting violations have also been effectively curtailed, with no shooting incidents having occurred in the past 12 years. Three Canada geese and a snowy egret (*Egretta thula*) have been shot in the 11 year period since 1977, but these violations are minimal considering the thousands of hunt hours involved.

CONCLUSIONS

The Bosque Snow Goose Hunt has faced many challenges over the past 20 years, but no challenge has been greater than the introduction of the whooping crane. Through compromise, intensive management and education, a seemingly irreconcilable conflict was resolved. In these days of shrinking habitat, varied land uses and declining hunting opportunities, land managers are more and more frequently forced to face similar situations. Approaches similar to those outlined in this paper may provide some insight in solving these problems.

Table 1. Goose harvest by species

Year	Canada Goose	White Fronted	Snow Goose
1966	365	1	38
1967	354	0	63
1968*	214	3	69
1969			73
1970			257
1971			150
1972			47
1973			385
1974			303
1975			209
1976			691
1977			346
1978			424
1979			578
1980			587
1981			820
1982			411
1983			998
1984 (Actual hunt date February 1985)			278
1985			568
1986			111
1987			81

* Last year that Canada geese and white-fronted geese were legal.

Table 2. Snow & Canada goose population data - Bosque del Apache NWR, 1951-1987

Year	Snow Goose Population	Canada Goose Population
1951	188	2,950
1961	1,043	4,112
1966	2,600	3,150
1967	3,500	3,500
1968	3,800	2,200
1969	4,000	2,900
1970	7,900	2,350
1971	8,600	1,700
1972	8,020	2,100
1973	16,000	1,850
1974	13,000	1,200
1975	18,500	1,000
1976	21,250	1,200
1977	21,550	2,200
1978	28,500	2,250
1979	25,000	460
1980	30,040	797
1981	29,000	809
1982	28,700	600
1983	34,000	985
1984	39,300	830
1985	56,800	500
1986	45,000	394
1987	32,000	450

Table 3. Dispersement of whooping cranes during 1983 hunt periods

Hunt Dates	Number of times whoopers flew over hunt area	Whoopers present on refuge at start of hunt	Whoopers present at end of hunt
17 Nov.-20 Nov. 1983	8	11	5
2 Dec.-5 Dec. 1983	16	13	6
28 Dec.-31 Dec. 1983	2	12	7
19 Jan.-22 Jan. 1984	1	8	6

Table 4. Bosque snow goose hunt costs, 1976-1986

Year	Total Costs
1976	\$21,199
1977	19,000
1978	17,078
1979	11,365
1980	8,370
1981	9,005
1982	8,828
1983	12,500
1984	16,531
1985	10,250
1986	5,500

U.S. DEPT. OF THE INTERIOR
FISH & WILDLIFE SERVICE
BOSQUE del APACHE NWR
HUNTING MAP
1966

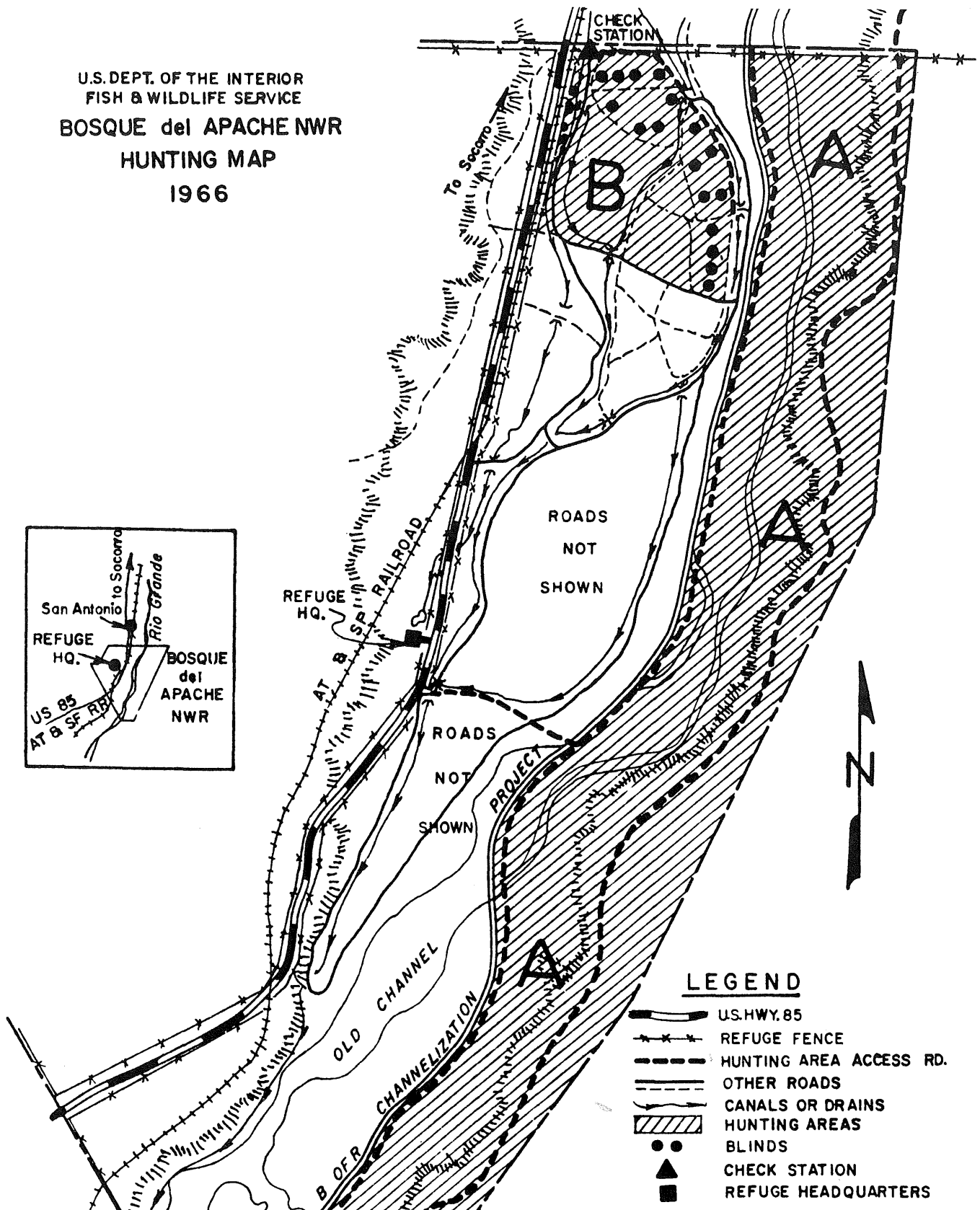


Figure 1. Areas open to goose hunting at Bosque del Apache National Wildlife Refuge in 1966

KNOW YOUR TARGET BEFORE YOU SHOOT

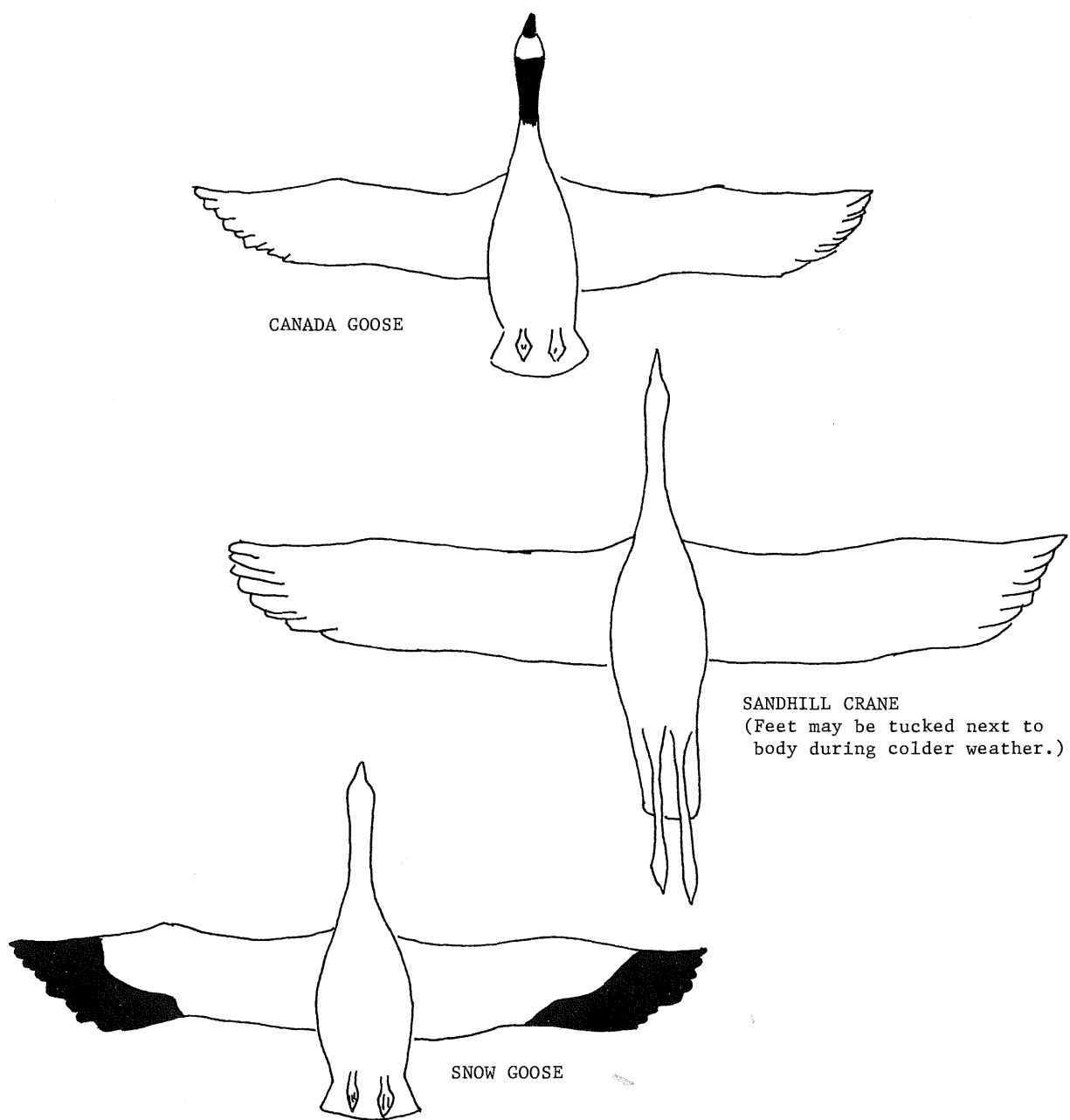


Figure 2. 1976 Flyer depicting the difference between sandhill cranes and geese.