

DRAFT

**Pacific Flyway Management Plan
for the
Pacific Population of Lesser Canada Geese**

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Prepared for the
Pacific Flyway Council
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Approved by: _____

Chairman, Pacific Flyway Council

Date

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I. INTRODUCTION

The Pacific Flyway Population of Lesser Canada Geese refers to two subspecies: Taverner's Canada geese (*Branta canadensis taverneri*) and lesser Canada geese (*Branta canadensis parvipes*), which breed in Alaska and northwestern Canada and winter primarily in Washington, Oregon, and California, with smaller populations suspected to winter in Idaho, Utah, Arizona, and Nevada. The management of this aggregate population has been complicated by controversy over the taxonomy of Canada geese. Palmer (1976) does not recognize *B. c. taverneri* as a valid subspecies, but recent genetics studies have demonstrated a substantial phylogenetic separation between the two lesser Canada geese (Shields 1994). *B. c. taverneri* is a large form of a small-bodied group, including *minima* and *leucopareia* (Shields and Wilson 1987); while *B. c. parvipes* is a small form of a large-bodied group (e.g. *occidentalis* and *moffitti*).

The management of lesser Canada geese is also hindered by poorly delineated ranges for the two subspecies, lack of separate breeding population estimates, poorly understood migration patterns, and mixing with other subspecies on wintering areas. For management purposes the population is divided on the basis of winter distribution into three segments: eastern Oregon and eastern Washington; western Oregon, western Washington, and California; and other interior states with smaller wintering populations (Montana, Idaho, Utah, Arizona, and Nevada).

This plan will detail all known population and migration information of the Pacific Population of lesser Canada geese, review research needs, and provide goals and objectives to guide wildlife agencies responsible for management programs.

II. GOAL AND OBJECTIVES

The goal of this management plan is to maintain the Pacific Population of lesser Canada geese at the level and distribution that will optimize recreational opportunities and minimize depredation and/or nuisance problems in agricultural and urban areas.

The objectives of the plan are categorized with respect to population size, distribution, and habitat utilization. Objectives are:

1. Begin identifying and quantifying nesting/molting, staging/migration, and wintering areas for lesser Canada geese in the Pacific Flyway.
2. Maintain adequate habitat to sustain current seasonal distribution of each subspecies of lesser Canada geese.
3. Begin population assessments of lesser Canada geese on nesting/molting, staging/migration, and wintering areas.
4. Manage lesser Canada goose populations and other goose populations with which they mix, to provide for prescribed aesthetic, educational, scientific, and hunting uses, recognizing both subsistence and sport hunting needs.

III. POPULATION STATUS

Nesting and Molting Areas

Specific breeding ranges of *B. c. taverneri* and *B. c. parvipes* have not been delineated through extensive banding or morphological classification of resident breeders. As indicated by Johnson et al. (1979), *B. c. taverneri* is presumed to generally occupy tundra regions from southwest Alaska to the North Slope, while *B. c. parvipes* occurs in the forested river basins of southcentral and interior Alaska into western Canada. The two subspecies mix extensively along the conjunction of their indefinite ranges and during the molt. Important nesting and molting areas are described in Table 1 and Figures 1 and 2.

Important nesting areas of *B. c. taverneri* include Bristol Bay, the outer Yukon-Kuskokwim (Y-K) Delta, Seward Peninsula, Kotzebue sound/Selawik lowlands, Upper Noatak River, and several disjunct areas on the Alaska North Slope. Primary nesting areas for *B. c. parvipes* include Upper Cook Inlet, inland portions of the Y-K Delta, and the basins of the Kuskokwim, Yukon, Inoko, Koyukuk, and Nowitna Rivers. In eastern Alaska, they occupy the Yukon Flats, Minto Flats, where a minimum of 17,000 birds are reported to nest annually, the Nelchina Basin, and the Tanana Valley. The Teshekpuk Lake region on Alaska's North Slope is an important molting area for 10-20,000 of both lesser Canada goose subspecies (Johnson et al. 1979; King and Hodges 1979).

The extent of *B. c. taverneri* into western Canada is unclear; most Canadian biologists consider the small, light-breasted geese of the Mackenzie Delta (and northeast Alaska) as *B. c. parvipes* (B. Turner pers. comm.). Nesting and molting of *B. c. parvipes* are continuous from Alaska into prominent areas in Canada: the Mackenzie River Delta, Old Crow Flats, Porcupine Valley, Peel River Valley and tributaries, Yukon Valley, Liard River Valley and tributaries, and Ogilvie River Valley, where a minimum of 13,000 geese are thought to nest and molt.

Migration Routes and Staging Areas

The migration of lesser Canada geese to and from summering areas is not well known. Three major migration routes are used, two through the Gulf of Alaska and one inland (see Table 1).

A. Trans-oceanic: The primary fall migration of *B. c. taverneri* originates from a major staging area near Izembek Lagoon near Cold Bay, Alaska. Band returns indicate that these birds nest on the Y-K Delta and aggregate on the south side of Nunivak Island from late August to late September. From there, all Taverner's Canada geese apparently move to the Izembek area, arriving in late August and peaking usually in mid-September. As early as October 20, but usually about November 1, the geese leave Izembek and apparently migrate to western Oregon and SW Washington. Spring migration is probably along the Gulf of Alaska, because few Canada geese appear on the western Alaska Peninsula in spring.

B. Coastal: Birds of both subspecies, mostly from the Inoko, upper Kuskokwim, and other drainages of western interior Alaska move through Cook Inlet and down the Gulf coast

continuously from late August until mid-October. Peak numbers occur in Cook Inlet during the last week of September and first week of October. Hawkings (1982) concluded that most lesser Canada geese moved through Copper River Delta during the second week of October, seldom earlier, but occasionally later. By November 15, nearly all lesser Canada geese have departed from southeast Alaska. Band recoveries indicate that most of these birds winter in western Oregon. In spring, the first lesser Canada geese usually arrive in southeast Alaska by March 10 and peak about April 10. They stop only briefly on Cooper River Delta in the third week of April and stage or settle for nesting in Cook Inlet April 25-May 10.

C. Inland: A small number of lesser Canada geese from Alaska's North Slope migrate east into Canada, beginning in August, and move south up the Mackenzie Valley. Historically, geese using the main interior route from central Alaska into Yukon Territory are predominantly *B. c. parvipes*, but there are indications that a growing number of *B. c. taverneri* (probably from NW Alaska) use this migration route. Aggregation at northern staging areas begins in late August through early September. Peak fall concentrations in the Delta Junction area of central Alaska occur between September 20 – 25. Migration progresses up the Tanana Valley through late September and into Canada by early October. By October 5, most geese have left interior Alaska and northern Canada.

The Nisutlin River Delta, located near the Yukon-British Columbia border, is an important fall staging area for lesser Canada geese migrating through Canada. Birds move through the delta from mid-August to mid-October, reaching peak numbers near 5,000 birds in mid-September. During their stay on the delta, the birds feed on *Potamogeton spp.*; *Carex spp.*; *Ranunculus sp.*; and *Equisetum sp.* The availability of these plants, in addition to weather, plays an important role in determining the length of time the birds remain on the area. When high water levels reduce access to the preferred food, *Potamogeton spp.*, it forces increased use of less desirable plants such as *Equisetum sp.* This situation will shorten the length of time the birds stay on the Delta. Migration continues south through central British Columbia and into eastern Washington and eastern Oregon by November.

The spring migration occurs more rapidly. Peak concentrations at Fairbanks and Delta generally occur between April 20-25. Major arrival on the nesting grounds generally precedes suitable nesting conditions by a few days. In most years, interior areas in Alaska and Canada are suitable for nesting by May 15; favorable nesting conditions on coastal areas are more variable and generally later.

Wintering Areas

Wintering population size and distribution information is summarized for Washington, Oregon, and California in Table 1 and Figures 3-5.

The population in California, based on mid-winter inventories, has been approximately _____ geese in recent years. However, accurate census data are not available due to small population levels proportional to other species, difficulty in separating subspecies (cackling, Aleutian, and western Canada geese are also present), and widespread wintering habitat.

The eastern Washington and eastern Oregon wintering area annually winters an estimated 100,000 to 135,000 lesser Canada geese. Band return information suggests that birds wintering in this area, primarily nest in interior Alaska or the Yukon and use an interior migration route (see Figure ____). The birds appear in the northern portion of the area in late October and peak in numbers during early November. In Washington, migration use areas in the north Columbia Basin have shifted from northern Grant County to Lincoln County in recent years. Geese then move southerly into the Tri-Cities area of Washington and into the Umatilla/Boardman area of Oregon as winter progresses. Peak populations occur in the southern area in late December or early January.

Spring movement shows a reverse trend with peak numbers appearing in February and March in the northern portion of the wintering area. All lesser Canada geese have migrated by mid-April.

The number of lesser Canada geese has increased dramatically in western Oregon and Washington since 1973. Before 1973 lesser Canada geese comprised less than 10 percent of the wintering Canada goose population but now are more abundant than dusky Canada geese (Simpson and Jarvis 1979; Jarvis and Cornely 1988). Presently, of the estimated 125,000 Canada geese wintering in western Oregon and western Washington, a minimum of 60,000 are lesser Canada geese.

Lesser Canada geese begin appearing on the lower Columbia River in early November and the Willamette Valley numbers peak by late November. The chronology of spring migration in this area is not well understood.

Band returns indicate that birds migrating to western Oregon, western Washington, and California, nest and migrate in the same areas, which is thought to be primarily in western and coastal Alaska.

A small population of 4,000 to 6,000 lesser Canada geese (*B. c. parvipes*) migrate to western Nevada, south and east of Reno. These geese primarily winter at Stillwater National Wildlife Refuge with numbers peaking in December or January at 3,200 to 3,800, except in extreme drought years when a shift to the Mason Valley occurs. Overall, from 1991 through 1993 an average of 76 percent of the geese in western Nevada were lesser Canada geese. Neck collar returns from a 1991 collaring effort suggest these birds nest in the northwest corner of the Northwest Territories in Canada.

The Nevada wintering population does not leave the state during the winter regardless of weather. Reverse migration occurs in the second or third week of February when all lesser Canada geese leave western Nevada.

A small number of lesser Canada geese winter in Arizona. Approximately 2% (400 birds) of the wintering population of Cibola National Wildlife Refuge is thought to be lesser Canada geese. Another 100 lesser Canada geese winter along the lower Colorado River. Migration information is absent for this population.

Information on wintering numbers and distribution in Idaho and Montana is unknown.

IV. CURRENT USE

Harvest

The most predominant use of lesser Canada geese is by hunters. However, harvest data for individual Canada goose populations are incomplete or nonexistent because harvest is not distinguished by subspecies in state and federal questionnaire surveys, nor in the Federal Parts Collection Survey. Limited bag check information is available only from certain areas of Washington, Oregon, and California.

According to federal survey data, harvest of all Canada geese in Alaska averaged approximately 9,500 birds during 1971-80 and state and federal data indicate a harvest of 6,100-6,700 during 1981-90. Lesser Canada geese probably make up over 70 percent of the statewide Canada goose harvest, and probably comprise nearly all of the Canada geese taken in northwest and interior Alaska, the outer Alaska Peninsula, and Cook Inlet. Northern and central Alaska harvest of principally *B. c. parvipes* have been highly variable, but averaged about 1,700 Canada geese during the 1980's (ADFG). Izembek Lagoon is the primary harvest area for *B. c. taverneri* where they make up 95 percent of the Canada geese taken (C. Dau, pers. comm.). Average Canada goose harvest in this prime hunting area has declined from 3,200 during 1971-80 (Carney et al. 1983) to 2,300 during 1981-90 (Martin 1991). The Canada goose harvest in Cook Inlet has averaged about 1,300-1,600 of both lesser subspecies since 1982 (ADFG).

Mixed stocks of lesser and other Canada geese are harvested on the Y-K Delta, eastern Alaska Peninsula, and along the Gulf Coast and southeast Alaska. Harvest data from the Y-K Delta and eastern Alaska Peninsula include cackling Canada geese, preventing subspecies estimates. Restriction of Canada goose limits in 1982 and complete closure in 1984 to protect cackling Canada geese reduced harvest in western and southwestern Alaska. Similarly, lesser Canada geese are mixed with dusky and/or Vancouver Canada geese in harvest from Prince William Sound through the Gulf Coast and Southeast Alaska. Since 1984, a delayed and shortened season in the Copper River Delta and eastern Gulf Coast to protect dusky Canada geese has probably altered the subspecies composition and reduced total Canada goose harvest in this region.

Information on the spring and summer subsistence harvest of lesser Canada geese is sparse in Alaska and Canada. Wolfe et al. (1990) characterized migratory bird subsistence harvests in Alaska for the mid-1980's, reporting an estimated 80,000 geese taken annually in rural areas. Lesser Canada geese are the most ubiquitous and accessible geese throughout the state. Although subspecies composition data are not adequate for subsistence harvest, lesser Canada geese are the principle resource for spring and summer harvests in interior and northern Alaska. Wolfe et al. (1990) estimates goose harvests of 18,000 in the Seward Peninsula – Norton Sound region and a similar level in the Upper Yukon-Koyukuk-Lower Tanana river basins. A survey of villages on the Y-K Delta has provided more information on lesser Canada goose harvests in this region where both lesser subspecies are found and waterfowl are taken in large numbers for subsistence (Wentworth 1993). Since 1985, the lesser Canada harvest has averaged 5,000 geese

(8-year) and has shown an increase to over 7,000 in 1992 and 1993 (Wentworth unpubl. data 1994).

In the Yukon Territory, sport harvest has been 300 to 500 lesser Canada geese, most of which are *B. c. parvipes*. Data for other affected regions of Canada is absent.

Currently, lesser Canada geese predominate the harvest in western Oregon and Washington. During the 1992 and 1993 hunting seasons, lesser Canada geese comprised 61 percent of a total harvest of approximately 6,000 geese from Portland to the mouth of the Columbia River. Lesser Canada geese comprise up to 80-90 percent of the current harvest in the Willamette Valley of Oregon.

Based on discussions with field biologists and the interpretation of past harvest data, an estimated average of 25,000 lesser Canada geese are harvested annually by hunters in eastern Oregon and eastern Washington. The harvest of lesser Canada geese has also increased in the past 20 years in northcentral Oregon. With harvest in most areas remaining fairly constant, this indicates a buildup of the wintering population in northcentral Oregon and southeast Washington. While the population of lesser Canada geese has increased in these areas, there have been decreases in some coastal areas, including the Puget Sound. Overall, a harvest decrease for all areas of Washington is indicated despite increasing goose numbers in several areas of the state.

Harvest of lesser Canada geese in Nevada is minimal except on the western edge of the Stillwater NWR where a small percent of the geese wintering there are taken. Harvest information is not available from other states.

Non-consumptive Use

In recent years, many persons have gained a greater awareness of their environment, resulting in a greater interest in wildlife. Geese, because of their impressive flocking nature and their occurrence near large population centers, can provide numerous opportunities for viewing recreation. Management practices which increase goose use generally enhance nonconsumptive uses. Areas closed to hunting may be open to public viewing and such areas frequently have roads and parking areas to increase access.

State and federal agencies have interpretive programs, make new releases, distribute brochures, and employ other means to enhance the appreciation of Canada geese by the public. Continual coordination exists between managing agencies and organized groups interested in birds, such as the Audubon Society.

The spring arrival of lesser Canada geese is particularly welcomed in Alaska, where they stop near major urban centers. Mendenhall State Game Refuge near Juneau features migrant lesser Canada geese in spring and fall. Lesser Canada geese are a primary interpretive resource at Creamer's Field State Game Refuge (Fairbanks) where farm fields are managed by interior migrants and are the focus of community events. Anchorage Coastal Refuge not only hosts migrant Canada geese; the entire city has a large and thriving lesser Canada goose population

that is an attraction in city parks during the entire summer. The gathering of *B. c. taverneri* is part of the impressive fall spectacle of geese found at Izembek Lagoon, near Cold Bay, through September and October.

Areas of Washington and Oregon where non-consumptive use is particularly heavy include the Sauvie Island Wildlife Area (state owned); Ankeny, Baskett Slough, Finley, Ridgefield, and Julia Butler Hansen National Wildlife Refuges (NWR), and upper reaches of the Columbia River, including the Umatilla NWR.

Research/Education

There has been little educational or scientific use of these geese throughout their range. In Alaska, lesser Canada geese have been the subject of few scientific investigations. Both subspecies were part of a genetics study of Alaska Canada goose races by University of Alaska-Fairbanks. This work concluded that, although their ranges are adjacent, *B. c. parvipes* and *B. c. taverneri* are not closely related (Shields 1994). Lesser Canada geese are prominently featured in many Alaska school programs, including a statewide wetland/waterfowl curriculum for all public schools (ADFG/USFWS 1991). In 1993, USFWS personnel placed a satellite transmitter on a lesser Canada in Fairbanks and school classes followed its migration to eastern Washington as a classroom project.

In Canada, lesser Canada geese staging in the Nisutlin River Delta, are used in educational programs, which annually introduces elementary students and adults to principles of critical habitat management, staging strategies of waterfowl, and banding programs. Similar education programs exist on the Y-K Delta in Alaska.

A study of wintering biology of Canada geese in the Willamette Valley was completed in the early 1980's and students from Oregon State University continually utilize geese in the Willamette Valley for a variety of educational purposes. Research in other western states has not occurred. The potential or need for educational and scientific studies is evident, as discussed and emphasized in other sections of this management plan.

V. CURRENT MANAGEMENT PRACTICES

Few management practices have been specifically directed at lesser Canada geese but rather towards other subspecies or mixed stocks of Canada geese. However, such management has, in most cases, benefited lesser Canada geese. Major management practices include: establishing annual hunting regulations; limited hunting in parts of the Columbia Basin of Washington; hunting closures of certain wintering areas especially in the Willamette Valley; creation of reserves and refuges to provide sanctuary and habitat; and farming on refuges and management areas to provide winter feed.

At the present time, little information is available for monitoring status or annual trends in the two lesser Canada goose populations. Although lesser Canada geese have been banded intermittently in Alaska since 1941, the subspecies ranges are not well-defined. Most bandings have been done on aggregations in a few key molting areas, such as the Inoko River and Y-K Delta sites, and on the population in upper Cook Inlet near Anchorage. Banding and survey efforts have covered only a small portion of the collective lesser Canada goose range in Alaska, with the least known about northern and eastern interior regions. Consequently, band recoveries do not accurately reflect associations of wintering birds with specific breeding areas or a representative pattern of harvest derivation (Figure x). In the absence of range delineations, development of indices of abundance and productivity has not been feasible. The only regular status data come from annual fall counts of Taverner's Canada geese gathered at Izembek Lagoon and periodic surveys of *B. c. parvipes* abundance and productivity in Cook Inlet.

Recent efforts to differentiate subspecies of Canada geese in the field and in harvest have included collection of culmen and other morphometric measurements at check stations and in hunter-bag checks, measurement of tail retricies in the federal Parts Collection Survey, comparison of breast feathers with a reference collection and color charts for the harvest in western Oregon and Washington, and use of aerial photography to determine subspecies composition and size of the wintering flock in western Oregon and southwest Washington. There is relatively much less known about the abundance and distribution of lesser Canada geese throughout the remainder of the western states.

Habitat enhancement for lesser Canada geese in southern areas has been mostly coincidental to agricultural development. Large increases in habitat were provided by agricultural development in the Columbia Basin, and habitat has been protected by establishing state and federal waterfowl areas in Oregon, Washington, and California. Marsh management, browse planting, and controlled burning has enhanced habitat on many federal and state management areas.

Hunting closures or restrictive harvest frameworks in California and Oregon for the protection of Aleutian Canada geese (*B. c. leucopareia*), cackling Canada geese (*B. c. minima*), and dusky Canada geese (*B. c. occidentalis*) have benefited lesser Canada geese. Otherwise, harvest regulations for lesser Canada geese have been set on a traditional basis, and in accordance with management objectives and procedures aimed at other less abundant subspecies. Harvest estimates have usually been made for all Canada geese without techniques to identify subspecies. A notable exception to this is southwest Washington and northwest Oregon. A low dusky Canada goose population has resulted in a very restrictive fall hunting season to minimize

harvest. Participating hunters are required to take a goose identification course where differences in subspecies of Canada geese are presented. Dusky Canada goose harvest quotas are established in subunits of the hunt area. The season runs from mid-November to mid-January, or until the dusky quota is met in each subunit. Geese harvested in this season are measured at check stations by state and federal personnel. These restrictions have offered protection and limited harvest of lesser Canada geese.

Historically, Canada goose hunting regulations have been more liberal in Alaska than in some southern portions of the Pacific Flyway, largely because of early freeze-up, fewer hunters, and more amenable geographic separation for goose stocks for independent harvest management. The general goose season extends 107 days from September 1 – December 16 in most of Alaska (October 8 – January 22 on Kodiak Island and the Aleutians). However, most geese have left northern and western Alaska by late September and are gone from the Gulf Coast by mid-October. Basic aggregate bag limits for Canada and white-fronted geese have been 4 daily, 8 in possession.

Hunting for all Canada geese has been closed in the Aleutian Islands since 1973 to protect Aleutian Canada geese; in Game Management Units 9E (upper Alaska Peninsula) and 18 (Y-K Delta) since 1984 to protect cackling Canada geese; and in Kodiak since 1986 to protect birds transplanted to establish a local breeding population. Harvest of lesser Canada geese likely declined as a result of the closures for cacklers and Kodiak geese, and a reduction of hunter participation on the Alaska Peninsula (Izembek Lagoon) after broad goose and brant restrictions were applied in the mid-1980s. Since 1984, Canada goose season in Units 5 and 6 (eastern Prince William Sound/Copper River Delta) has been delayed until September 21 to allow dusky Canada geese to leave. The rationale of this strategy includes the assumption that arriving lesser Canada geese will dilute harvest pressure on duskys. Although harvest data do not reflect subspecies composition from this area, a reduction of three weeks from the season is significant to local opportunity on this staging area and may benefit lesser Canada geese, as well as dusky Canada geese, in years of early or rapid migration.

Subsistence hunting of lesser Canada geese in rural areas, largely occurring in spring, has been a long standing cultural and economic tradition, particularly in western and northern Alaska, and some interior river basins. Efforts to measure, manage, and regulate this harvest have only recently intensified, largely as a result of the Y-K Delta Goose management Plan (1983) in western Alaska and renewed interest in amending the migratory bird treaty with Canada to allow for regulated spring hunting. Although lesser Canada geese (mostly Taverner's) are not primary subjects of the Y-K Plan, they have been a part of associated education and management programs for geese in the region and their use is recorded in annual village harvest surveys. For the most part, management of subsistence Canada goose hunting has not been addressed in an integral fashion in interior or northern Alaska. Conservation problems are not readily apparent and there is not strong impetus to develop regional programs for cooperative management. Future prospects for regulated subsistence hunting will undoubtedly create broader opportunities to evaluate the status of lesser Canadas and local management strategies throughout Alaska.

Although the hunting season of Canada varies from 90 to 105 days, the practical hunting opportunity varies from a few days in length in the far north to about 75 days of hunting in the

south. Bag and possession limits are 5 and 10, respectively, in British Columbia, with some local restrictions. In Yukon Territory, the daily bag limit below the Arctic Circle is 5 geese with 15 in possession. North of the Arctic Circle, the bag limit is 15 with no possession limit.

Washington season lengths varied from 80 to 95 days during 1955 to 1967. Daily bag and possession limits for dark geese were 3 per day and 3 in possession from 1955 to 1960. The possession limit was increased to 6 in 1961, and remained at that level until 1993, when bag and possession limits were increased to 4 and 8 respectively.

From 1955 through 1991, goose hunting in eastern Washington was restricted to 3 days a week and holidays in 10 counties, which amounted to an actual season of 35 to 47 days. The remaining 10 counties in eastern Washington were open the entire season. In 1992, a portion of this 10 county area was liberalized to 4 days a week. Since 1968 the total framework season length has been 100 days in the 10 county area.

The counties restricted to 3 days per week hunting are the primary migration and wintering areas of lesser Canada geese in Washington. The restriction accomplishes two principal purposes; it tends to “hold” geese in areas by insuring that birds will not be harassed continually; and secondly, geese are allowed to feed and rest over a broader geographic area of their wintering grounds.

Season lengths and bag limits in Oregon have been similar to those in Washington except Oregon allows goose hunting 7 days a week in most areas.

California hunting scenarios????

VI. MANAGEMENT PROBLEMS

The informed management of any wildlife species requires a certain level of base data be available. Important data include: delineation of nesting, staging, and wintering areas; population status and trend indices; some understanding of the movements between these areas; mortality levels from predation, harvest, disease, and from migration/thermal/nutritional stress; survival rates for the populations; recruitment to the population; and ecological requirements. Unfortunately, information of this type is either inadequate or lacking for lesser Canada geese. This can be attributed to several factors, including:

1. Lesser Canada geese nest in low densities over a broad geographical range. This makes identification and census of nesting areas difficult.
2. The lesser Canada goose subspecies are very difficult to distinguish and they mingle with other subspecies of Canada geese, making census of individual populations difficult, if not impossible in some areas.
3. Their “wary” flocking nature disproportionately reduces lesser Canada goose vulnerability to hunters causing biases in harvest data taken from mixed populations, limiting the types of information derived from this information source.
4. Overall, lesser Canada goose populations appear to be at healthy levels and gradually increasing. This tends to shift attention away from potential localized problems with lesser Canada geese to other subspecies for which there is greater concern (i.e. cackling, Aleutian, and dusky Canada geese).

Breeding Grounds

Although *B. c. taverneri* is apparently oriented to coastal tundra and *B. c. parvipes* inhabits interior and southcentral river basins, the breeding ranges of both lesser Canada goose subspecies remain undefined, and their relation to Canada goose populations to the east in Canada are unclear. This fundamentally hampers progress to define population units, assess their status, and design appropriate conservation strategies. Comprehensive morphometric and phylogenetic studies have not been conducted to describe the subspecies and their distributions. Most banding information is outdated and efforts have not been applied to reference areas throughout the breeding grounds.

The lack of delineated populations prevents development of abundance estimates and indices to change in individual subspecies and local breeding units. Similarly, production surveys and use of banding to estimate survival and age structure can not currently be related to specific populations. The uncertain affiliation of local breeders and the general well-being of lesser Canada geese, in aggregate, has resulted in a low priority for detailed studies of breeding biology and factors affecting production, as well as research on ecological requirements. Unclear population delineations and poorly understood habitat use patterns also inhibit evaluation of potential impacts from local development projects and land use policies (e.g. agricultural practices, oil and gas extraction and transport, urban expansion, transportation corridors).

Measuring the Canada goose harvest through conventional surveys is more difficult in rural northern areas than in urban population centers. Access to licensed hunters and response rates are generally lower. Assessing subspecies composition of Canada geese in the harvest is difficult across most of the summer range, as it is throughout the flyway. Opportunities for effective bag checks or examination of harvested birds are rare. In only a few areas the harvest can be reliably assigned mostly to a single subspecies (e.g. Izembek). Except on the Y-K Delta, information on the magnitude and composition of subsistence harvest is poorly known, partly because of irregular coverage by dedicated surveys, and reluctance by hunters to report illegal harvest. There may be valid concerns about spring hunting near some nesting areas and vulnerability of family groups and molters on interior river systems during late summer.

Staging/Migration Areas

Migration routes and staging areas are not well defined along inland routes, limiting the options of managing agencies to protect habitat and regulate harvest.

Wintering Areas

The identification and estimation of numbers of geese by subspecies is difficult. This limits the options of managing agencies to monitor changes in subspecies composition and numbers of geese in some areas, and complicates management of individual subspecies.

The carrying capacity of wintering areas is undetermined. Unknown biological aspects (energetic requirements of geese and nutrient availability in forage), as well as political, sociological and economic ramifications of wintering Canada geese complicate problem solving in concentration areas.

Increasing concentrations of lesser Canada geese confined to a few areas pose concerns of increased agricultural depredation, increased potential for disease, and may limit utilization of the resource to relatively few people. The use of pesticides may pose a serious threat in some prime wintering areas.

VII. RECOMMENDED MANAGEMENT ACTIONS

The following management actions are recommendations recognizing that the degree and timing of their implementation by the various wildlife agencies will be influenced by personnel, fiscal, and legislative constraints beyond the scope of this plan. Whenever possible, management actions should be coordinated and incorporated into species and/or habitat management plans for other migratory birds in the Flyway.

Breeding Grounds

1. Delineate populations of lesser Canada geese through a combination of banding and marking, compilation of morphometric data, and genetic analyses throughout the breeding range, and relating recoveries to specific migration routes and wintering areas. Subtasks include:

- (a) analyze previous banding data and designate geographic reference units for all major breeding areas.
- (b) increase banding/marking of lesser Canada geese from all key breeding reference areas; establish suitable banding goals.
- (c) determine feasibility of banding and/or radio-marking of local breeders and their young from selected nesting areas to determine summer movements and migration patterns.
- (d) compile morphometric data from local breeding birds and molters in all reference areas.
- (e) obtain representative blood and/or tissue samples from local breeders and young for genetic classification of birds from reference areas.

RESPONSIBILITY: USFWS, CWS, ADFG, Yukon GB, BCMEP, NWT-DRR

PRIORITY: 1

IMPLEMENTATION: 1995-2005

2. Establish population surveys of lesser Canada geese on known primary nesting areas to develop estimates of abundance and distribution, trend indices, and habitat requirements. In Alaska, key areas include: Cook Inlet, Yukon Flats, Kanuti, Nowitna, Koyukuk, Inoko, Yukon Delta, and Selawik regions (NWRs). In Canada, key areas include: ????. Subtasks include:

- (a) design survey protocols and a geographic data base for pair, nest, and brood records.
- (b) evaluate feasibility and implement fixed-wing aircraft and boat surveys on primary reference areas.

RESPONSIBILITY: USFWS, CWS, ADFG, YGB, BCMEP, NWT-DRR

PRIORITY: 1

IMPLEMENTATION: 1995-2005

3. Initiate breeding biology studies in areas where populations are known to be decreasing.

RESPONSIBILITY: USFWS, ADFG, CWS, Yukon GB, NWT-DRR

PRIORITY: 2

IMPLEMENTATION: As needed

4. Continue, in cooperation with native groups, to estimate the magnitude, species composition, and timing of subsistence waterfowl harvest in Alaska and Canada at least once every 3 years.

RESPONSIBILITY: USFWS, CWS, ADFG, Yukon GB, NWT-DRR

PRIORITY: 2

IMPLEMENTATION: Review survey protocols in 1995. Determine priority areas.

Staging and Migration Areas

1. Conduct a minimum of five annual surveys of lesser Canada geese in the Izembek area during the mid-October peak to estimate the fall staging population.

RESPONSIBILITY: USFWS

PRIORITY: 1

IMPLEMENTATION: 1995

2. Test the feasibility of conducting surveys to identify spring and fall staging areas and to acquire estimates of both peak numbers and total seasonal use by lesser Canada geese.

RESPONSIBILITY: USFWS, CWS, ADFG, YGB, BCMEP, NWT-DRR

PRIORITY: 2

IMPLEMENTATION: Begin review in 1995

3. Provide necessary resources for an observation and/or radio-tracking network to support cooperative marking projects; evaluate the potential to track geese color- or radio-marked on spring staging areas to specific nesting grounds.

RESPONSIBILITY: USFWS, CWS, ADFG, YGB, BCMEP, NWT-DRR, WDW, ODFW

PRIORITY: 2

IMPLEMENTATION: 1996

Wintering Areas

1. Conduct annual mid-winter inventories of all Canada geese, coordinated with biannual field assessments for subspecies composition.

RESPONSIBILITY: USFWS, WDFW, ODFW, CDFG,

PRIORITY: 1
IMPLEMENTATION: 1995, ongoing

2. Develop and implement a system for subspecies identification in the field, using aerial photography or visual criteria.

RESPONSIBILITY: USFWS, WDFW, ODFW, CDFG;
PRIORITY: 1
IMPLEMENTATION: 1995, ongoing

3. Implement techniques to separate lesser Canada geese from other subspecies by using tail feathers obtained from parts collection surveys or morphological measurements on birds at the check stations. Continue check stations and field bag checks wherever feasible.

RESPONSIBILITY: WDFW, ODFW, CDFG, USFWS
PRIORITY: 1
IMPLEMENTATION: 1995, ongoing

4. Initiate banding programs on wintering areas to determine survival rates.

RESPONSIBILITY: USFWS, WDFW, ODFW, CDFG, IDFG, ADFG, NDW, UDWR
PRIORITY: 2
IMPLEMENTATION: 1996

5. Conduct feasibility study on the use of satellite telemetry technology in conjunction with leg banding projects to determine migration patterns and nesting origins of lesser Canada geese in the four wintering areas.

RESPONSIBILITY: USFWS, all states
PRIORITY: 2
IMPLEMENTATION: Begin feasibility review in 1996

6. Maintain goose pastures on state and federal lands to increase forage and hold birds in established wintering areas

RESPONSIBILITY: USFWS, ODFW, WDFW, CDFG
PRIORITY: 1
IMPLEMENTATION: 1995, ongoing

7. Provide necessary resources for an observation and/or radio-tracking network to support cooperative marking projects; evaluate the potential to track geese color- or radio-marked on wintering areas to specific nesting grounds.

RESPONSIBILITY: USFWS, WDW, ODFW
PRIORITY: 1
IMPLEMENTATION: Begin 1995, review as needed.

All Areas

1. Some critical habitat areas of lesser Canada geese are affected by industrial, hydropower, or community expansion or the threat of such development. Negative habitat trends should be limited to protecting critical lesser Canada goose habitats whenever possible. Some means available are acquisition, cooperative agreements with landowners, and development of land use regulations to minimize disturbance.

An inventory of significant habitats threatened by potential land use change should be compiled to facilitate input to agencies regulating land uses. Important habitats should be incorporated into habitat protection strategies developed for the Pacific Coast and Intermountain West Joint Ventures.

RESPONSIBILITY: All states and provinces, CWS, USFWS.

PRIORITY: 1

IMPLEMENTATION: Begin 1995; review every two years

2. Increasing problems with depredation and nuisance problems warrant a review of methods to improve assistance to landowners in minimizing problems with lesser Canada geese. A review of all current problems should begin in 1995 in coordination with the subcommittee. All USFWS policies dealing with the take of depredating geese in agricultural and urban areas should be reviewed during the next year. Stable funding for USDA will also be sought.

RESPONSIBILITY: All states and provinces, CWS, USFWS, USDA

PRIORITY: 1

IMPLEMENTATION: Begin 1995; ongoing

3. Monitor regional and total Canada goose harvests and recommend changes in season length, bag limit, possession limit, shooting days and hours on an annual basis, to effect desired harvest and distribution.

RESPONSIBILITY: USFWS, ADFG, CWS, WDFW, ODFW, Yukon GB, CDFG,
BCMELP

PRIORITY: 1

IMPLEMENTATION: Annually

4. Promote opening of private lands to hunting to create additional recreational opportunities.

RESPONSIBILITY: WDFW, ODFW

PRIORITY: 1

IMPLEMENTATION: Ongoing

5. Maintain refuges or cooperatively managed areas listed in Table 1 for the primary purpose of habitat and wildlife protection and enhancement

RESPONSIBILITY: All Agencies
PRIORITY: 1
IMPLEMENTATION: Ongoing

6. Develop accurate techniques to estimate harvest rates on all subspecies of Canada geese occurring in mixed populations to determine the impact hunting strategies have on each subspecies.

RESPONSIBILITY: All Agencies
PRIORITY: 1
IMPLEMENTATION: Review as needed

VIII. PLAN REVIEW AND MANAGEMENT ADMINISTRATION

The Lesser Canada Goose Subcommittee shall meet twice annually, or as needed, to review progress towards achieving the goal and objectives of this plan, and to recommend actions and revisions. The Subcommittee shall report to the Pacific Flyway Council through the Study Committee on accomplishments and shortcomings of cooperative management efforts. This subcommittee shall coordinate management activities with those of the subcommittees on Dusky Canada Geese, Cackling Canada Geese, and Pacific Population of Western Canada Geese.

The subcommittee shall be composed of a representative from the Canadian Wildlife Service, U.S. Fish and Wildlife Service, and state and provincial agencies responsible for management of lesser Canada goose populations. Chairmanship shall be appointed biennially and rotated among member agencies. The Subcommittee will exercise its prerogative to invite participation (ex officio) at meetings by any individual, group, agency, or representative whose expertise, counsel, or managerial capacity is required for the coordination and implementation of management programs. It shall be the responsibility of those members to assure that the objectives and procedures of this plan are integrated and coordinated with those plans and activities of the various wildlife and land management agencies and local planning systems within their agency's venue, as well as the provisions of the North American Waterfowl Management Plan.

Chairmanship of the subcommittee will be rotated as follows: Oregon 1994,

Appendix A. Selected references for lesser Canada geese in the Pacific Flyway.

- Alaska Department of Fish and Game. 1971-1979. Annual report of survey and inventory activities – waterfowl. Proj. Prog. Rept. Fed. Aid Wildl. Rest. Job. 10.0.
- Bellrose, F.C. 1978. Ducks, geese and swans of North America. 2nd Ed. Rev. Stackpole Books, Harrisburg, Pa. 543 pp.
- Blus, L.J., C.J.Henry, D.L. Lenhart and E. Cromartie. 1979. Effects of heptachlor-treated cereal grains on Canada geese in the Columbia Basin. 105-116 p. In R.L. Jarvis and J.C. Bartonek, eds. Management and biology of Pacific Flyway geese. Oreg. State Univ. Book Stores, Inc. Corvallis, OR.
- Delacour, J. 1954. The waterfowl of the world. Vol. 1. Country Life Limited, London. 284 pp.
- Derksen, S.V., M.W. Weller and W.S. Eldridge. 1979. Distributional ecology of geese molting near Teshekpuk Lake, National Petroleum Reserve – Alaska. 189-207 p. In R.L. Jarvis and J.C. Bartonek, eds. Management and biology of Pacific Flyway geese. Oreg. State Univ. Book Stores, Inc. Corvallis, OR.
- Gabrielson, I.N. and F.C. Lincoln. 1959. The birds of Alaska. The Stackpole Co., Harrisburg, Pa., and Wildlife Management Institute, Washington, D.C. 922 pp.
- Hawkings, J.S. 1982. Migration and habitat relationships of geese on the eastern Copper River Delta, Alaska. M.S. Thesis. Univ. of Alaska, Fairbanks. 113pp.
- Johnsgard, P.A. 1975. Waterfowl of North America. Indiana Univ. Press, Bloomington, IN. 575 pp.
- Johnson, D.H., D.E. Timm and P.F. Springer. 1979. Morphological characteristics of Canada geese in the Pacific Flyway. 56-80 p. In R.L. Jarvis and J. C. Bartonek, eds. Management and biology of Pacific Flyway geese. Oreg. State Univ. Book Stores, Inc. Corvallis, OR.
- King, J.G. and J.I. Hodges. 1979. A preliminary analysis of goose banding on Alaska's Arctic Slope. 176-188 p. In R.L. Jarvis and J. C. Bartonek, eds. Management and biology of Pacific Flyway geese. Oreg. State Univ. Book Stores, Inc. Corvallis, OR.
- Palmer, R.S., ed. 1976. Handbook of North American birds. Vol. 2. Yale Univ. Press, New Haven, Conn. 521 pp.
- Parker, R.C. and D. McCaughran. 1979. Utilization of parts survey to determine the species composition of the Washington State goose harvest. 331-346 p. In R.L. Jarvis and J. C. Bartonek, eds. Management and biology of Pacific Flyway geese. Oreg. State Univ. Book Stores, Inc. Corvallis, OR.
- Shields, G.F. 1994. Phylogenies of North American geese: the mitochondrial DNA record. Biology and management of Canada geese: Proc. 2nd Internat. Canada Goose Symp. (In press).
- Simpson, S.G. and R.L. Jarvis. 1979. Comparative ecology of several subspecies of Canada geese during winter in western Oregon. 223-241 p. In R.L. Jarvis and J. C. Bartonek, eds. Management and biology of Pacific Flyway geese. Oreg. State Univ. Book Stores, Inc. Corvallis, OR.
- U.S. Fish and Wildlife Service. 1964. A report on fish and wildlife resources affected by Rampart Canyon Dam and reservoir project, Yukon River, Alaska. U.S. Dept. Interior – Juneau, AK. 122 pp.
- Washington Department of Game. 1955-1979. Waterfowl investigations and harvest reports. Fed. Aid Wildl. Rest., Proj. W-27-R, Study 1, Job 1.
- _____ and A.C. Wilson. 1987. Sub-species of the Canada goose (*Branta canadensis*) have distinct types of mitochondrial DNA. Evolution 41: 662-666.

Table 1. Primary Breeding and Molting Areas for Lesser Canada Geese.

ALASKA

| Map Index | Area | Type of use | Population estimate | Habitat Status and Threats |
|-----------|-------------------------|------------------------|--|--|
| 1 | Upper Cook Inlet | Breeding, Molting | 4,000 + increasing | Primarily state refuges and Municipality of Anchorage Oil and gas, urban expansion, increasing disturbance |
| 2 | Bristol Bay | Breeding, Molting | Unknown | Federal refuge, state, and private land; no major threats |
| 3 | Y-K Delta | Breeding, Molting | Unknown | Federal, private land; no major threats |
| 4 | Paimut Slough | Breeding, Fall Staging | Breeders unknown 5,000 + staging | Federal, private land; no major threats |
| 5 | Inoko Valley | Breeding, Molting | Unknown | Federal refuge, BLM, private land. No major threat |
| 6 | Anana-Kuskokwim Valleys | Breeding, Molting | Unknown | Federal, state, private land. No major threats |
| 7 | Koyukuk Valley | Breeding, Molting | 1,000+ | Federal, state, private land. No major threats |
| 8 | Nowitna Valley | Breeding, Molting | 200 - 500 | Federal refuge, private land. No major threat; suspected decline in Canada geese |
| 9 | Yukon Flats | Breeding, Molting | 8,000 breeding in the 1960s | Federal, private land; no major threats |
| 10 | Minto Flats | Breeding, Staging | Breeding 2,000+, Staging 5,000+ | State refuge, private lands. No major threats. |
| 11 | Nelchina Basin | Breeding | 500+ | State, private lands. No major threats. |
| 12 | Seward Peninsula | Breeding, Molting | Unknown | Federal refuge, private land; no major threats |
| 13 | Kotzebue\Selawik Basin | Breeding, Molting | Unknown | Federal refuge, private land; no major threats |
| 14 | Upper Noatak Valley | Breeding, Molting | 5,000+ | Federal park and preserve |
| 15 | North Slope | Breeding, Molting | Breeders unknown. 10 – 20,000 molt near Teshekpuk Lake | Federal and state land. Increasing disturbance from oil and gas development |

Table 1. cont.

CANADA

| Map Index | Area | Type of use | Population estimate | Habitat status and threats |
|-----------|-----------------------|-------------------|---------------------|---|
| 1 | Mackenzie River Delta | Breeding, Molting | Unknown | Potential Threat: Oil Spill |
| 2 | Old Crow Flats | Breeding, Molting | Approx. 5,000 | Property of National Park, special Mgmt. Area |
| 3 | Porcupine Valley | Breeding, Molting | Approx. 500 | |
| 4 | Peel River Valley: | Breeding, Molting | Approx. 1,000 | |
| 5 | Lower Yukon Valley: | | | |
| | Pelly River | Breeding, Molting | Approx. 1,000 | Hydro power development |
| | Stewart River | Breeding, Molting | Approx. 500 | Hydro power development |
| 6 | Upper Yukon Valley | | | |
| | Nisutlin River | Breeding, Molting | Approx. 3,000 | Hydro power development |
| 7 | Liard River Valley: | Breeding, Molting | Approx. 1,000 | Hydro power development, logging |
| 8 | Ogilvie River Valley | Breeding | Approx. 500 | |
| 9 | Coal River Valley | Breeding | Unknown | |

Table 2. Primary Staging Areas for Lesser Canada Geese.

ALASKA

| Map Index | Area | Type of use | Population estimate | Habitat status and threats |
|-----------|---|-------------------------|---------------------|---|
| 1 | Iditarod | Fall Staging | 5,000 + | Federal refuge, private lands. No major threats. |
| 2 | Creamer's Field (Fairbanks) | Spring Staging | 5,000 + | State refuge managed for forage and viewing of migrant geese. |
| 3 | Delta Junction | Spring and Fall Staging | 10,000 + | State and private land; agriculture generally beneficial, but CRP habitat deteriorating |
| 4 | Cook Inlet marshes and agricultural land. | Spring and Fall Staging | 50,000 + | Mostly state refuge, Kenai NWR, private agricultural residential; Some threat from on and off shore oil and gas development, urban expansion, disturbance |
| 5 | Copper River Delta Beromg R./Controller Bay | Spring and Fall Staging | 50,000 + | Federal (FS), state lands, cooperatively managed. No major threats. |
| 6 | Stikine River Delta | Spring and Fall Staging | Unknown | State refuge, federal refuge, private lands. No major threats |
| 7 | Nunivak Island | Fall Staging | Approx. 10,000 | Federal refuge, private land. No major threats |
| 8 | Chagvan Bay | Spring and Fall Staging | Unknown | State refuge, federal refuge, private lands. No major threats. |
| 9 | Izembek Lagoon | Fall Staging | Approx. 75,000 | State refuge, federal refuge. No major threats. |

Table 2. cont.

CANADA

| Map Index | Area | Type of use | Population estimate | Habitat status and threats |
|-----------|---|--|--|--|
| 1 | Tent Island – Moose Channel | Fall Staging | Unknown | Oil spill |
| 2 | Lower Yukon Valley: Pelly River Stewart River | Staging Staging | Approx. 1,000 Approx. 500 | Hydro power plans Hydro power plans |
| 3 | Upper Yukon Valley Teslin River Nisutlin River Shallow Bay Kluane/White River | Staging Staging Staging Staging | Approx. 500 Approx. 3,000 Approx. 500 Approx. 1,000 | Hydro power plans Hydro power plans Hydro power plans, agricultural development National park |
| 4 | Nisutlin Bay | Fall Staging | | Unknown |
| 5 | Liard River Valley | Staging | Approx. 1,000 | Hydro power plans, logging |

Table 3. Primary Wintering Areas for Lesser Canada Geese.

WESTERN OREGON AND WESTERN WASHINGTON

| Map Index | Area | Type of use | Population estimate | Habitat status and threats |
|-----------|----------------------|------------------------------------|-----------------------------|--|
| 1 | Sauvie Island | Spring and Fall Staging, Wintering | Approx. 30,000 – Increasing | Partly state owned, private land |
| 2 | Lower Columbia River | Wintering, Migration | Approx. 10,000 | Privately owned, Federal refuges; Expansion of cottonwood plantations. |
| 3 | Willamette Valley | Wintering, Migration | Approx. 30,000 | Partly federal refuge, part private land. |
| 4 | Willapa Bay | Wintering, Migration | Unknown | Federal refuge, private land. |

CALIFORNIA*

| | | | |
|---|-------------------------------|----------------------|-------------|
| 1 | Tulelake Basin | Migration | Up to 1,000 |
| 2 | Grenada area | Migration | Up to 1,000 |
| 3 | Meiss Lake | Migration | Up to 300 |
| 4 | Camp Far – West Reservoir | Migration | Up to 800 |
| 5 | Modoc NWR | Migration | Up to 2,000 |
| 6 | Sacrament – San Joaquin Delta | Wintering | 1,500+ |
| 7 | San Joaquin Valley | Wintering | Up to 900 |
| 8 | Clear Lake | Wintering | Up to 900 |
| 9 | Sacramento Valley | Wintering, Migration | Up to 3,000 |

*These represent incidental observations of numerous people and are not absolute populations of lesser Canada geese using various areas.

Table 3. cont.

EASTERN OREGON AND EASTERN WASHINGTON

| Map Index | Area | Type of use | Population estimate | Habitat status and threats |
|-----------|--|--|-------------------------|--|
| 1 | Stratford, Long, and Billy Clapp lakes | Spring and Fall Migration, Small Amount of Wintering Use | Nov. 1 – 25,000 | Partly state and private owned |
| 2 | Sprague Lake | Spring and Fall Migration, Small Amount of Wintering Use | Nov. 1 – 10,000 | Privately owned |
| 3 | Coffeepot and Duck Lakes | Spring and Fall Migration, Small Amount of Wintering Use | Nov. 1 – 60,000 | Privately owned |
| 4 | McNary NWR and Recreation area | Wintering | Dec. 1 - 10,000 | Federal refuge |
| 5 | Umatilla NWR | Wintering | Jan. 1 – 20,000 | Federal refuge |
| 6 | McKay NWR | Wintering | Jan. 1 – 5,000 | Federal refuge |
| 7 | Cold Springs NWR | Wintering | Jan. 1 – 20,000 | Federal refuge |
| 8 | Columbia NWR | Migration (wintering in mild winters) | Nov. 1 – 3,000 | Federal refuge |
| 9 | Carty Reservoir | Wintering | Jan. 1 – 35,000 | Privately owned, state managed |
| 10 | Ice Harbor Pool | Wintering | Dec. 1 – 4,500 | Corps of Engineers, state managed |
| 11 | Hanford Area | Wintering | Dec. 1 – 5,500 | Proposed for dam construction |
| 12 | Chief Joseph | Migration (wintering in mild winters) | Nov. 1 – 1,500 to 2,000 | Federally managed – Corps of Engineers |
| 13 | Spokane River | Migration (wintering in mild winters) | Nov. 1 – 1,000 | Privately owned |
| 14 | Rock Island Winesap | Migration (wintering in mild winters) | Nov. 1 – 500 | P.U.D. Reservoir |

NEVADA

| | | | | |
|---|-----------------|-----------|----------------------|---|
| 1 | Stillwater Area | Wintering | Jan. 1 - 2,500 | Part federal refuge, part privately owned |
| 2 | Mason Valley | Wintering | Jan. 1 – up to 4,500 | |
| 3 | Lahonton Res. | Wintering | Jan. 1 - 100 | |

ARIZONA

| | | | | |
|---|----------------------|-----------|--------------|----------------|
| 1 | Cibola NWR | Wintering | Jan. 1 – 400 | Federal refuge |
| 2 | Lower Colorado River | Wintering | Jan. 1 – 100 | |