Draft Compatibility Determination

Title

Waterfowl Hunting

Refuge Use Category

Hunting

Refuge Use Type(s)

Hunting (other migratory birds)

Refuge

Humboldt Bay National Wildlife Refuge

Refuge Purpose(s) and Establishing and Acquisition Authority(ies)

Humboldt Bay NWR was established under the authority of The Migratory Bird Conservation Act of 1929, The Migratory Bird Hunting and Conservation Stamp Act of 1934, the Fish and Wildlife Act of 1956, the Refuge Recreation Act of 1962, and The Endangered Species Act of 1973.

According to these authorities, Humboldt Bay NWR's purposes are:

- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C.§§ 715d (Migratory Bird Conservation Act)
- "... as Waterfowl Production Areas subject to... all of the provisions of such Act [Migratory Bird Conservation Act] ... except the inviolate sanctuary provisions ..." 16 U.S.C. 718(c) (Migratory Bird Hunting and Conservation Stamp Act)
- "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. §§ 742f(a)(4) and "... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." 16 U.S.C. §§ 742f(b)(1) (Fish and Wildlife Act of 1956)
- "...suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." 16 U.S.C. §§ 460k-1 (Refuge Recreation Act [16 U.S.C. §§ 460k-460k-4], as amended)
- "...the Secretary...may accept and use...real...property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors..." 16 U.S.C. §§ 460k-2 (Refuge Recreation Act [16 U.S.C. §§ 460k-460k-4], as amended)

- "... to conserve (A) fish or wildlife which are listed as endangered species or threatened species ....or (B) plants ..." 16 U.S.C. §§ 1534 (Endangered Species Act of 1973)

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as Refuge System, is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife,and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (Pub. L. 105-57; 111 Stat. 1252).

Description of Use

Is this an existing use?

Yes

What is the use?

The Humboldt Bay NWR proposes to continue to provide opportunities for waterfowl hunting, one of the six priority uses of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1966 (16 U.S. C. 668dd-668ee) as amended by The National Wildlife Refuge System Improvement Act of 1997 (Pub.L. 105-57; 111 Stat 1252). The Refuge System Administration Act identifies hunting as one of the six wildlife-dependent recreational uses to be facilitated in the Refuge System, and the Act encourages the Service to provide opportunities for the public to enjoy them. Hunting has been a traditional form of recreation around Humboldt Bay for generations. The hunt program at Humboldt Bay NWR is small compared to many other federal wildlife refuges in California such as Sacramento NWRC or Tule Lake NWR. However, Humboldt Bay NWR provides a unique public land hunting opportunity for the citizens of Humboldt County in general and specifically for the cities of Eureka, Arcata and Fortuna. The high-quality hunting resulting from a lottery draw for designated blinds offered at the Salmon Creek Unit of HBNWR is different than the other public lands open to hunting in the area, which are managed as free roam hunt areas. During the public scoping period for the CCP (January 29 – March 15, 2007) the majority of the comments received about the hunt program supported stable or increased hunting opportunities at the refuge.

Is the use a priority public use?

Yes

Where would the use be conducted?

Hunting on the refuge has occurred traditionally in White Slough, Eureka Slough, Jacoby Creek, Teal Island and Table Bluff Units, and the controlled hunt area of the

Salmon Creek Unit. Concurrent with implementation of the Ma-le'l Dunes Cooperative Management Agreement, on the Ma-le'l Dunes Unit hunting will be allowed on 10 acres of the Fernstrom-Root Island and retrieval will be allowed on the areas of Ma-le'l Island within the Service's jurisdiction. The hunting program would be conducted at the following areas:

Salmon Creek Unit

Hunting at the Salmon Creek Unit occurs two days per week, Tuesday and Saturday from ½ hour before sunrise until 3:00 PM during the entire regular hunting season. During check in hunters will receive a daily hunting permit for their blind. Hunting blinds are selected using a lottery draw occurring 1 and 1/2 hours before legal shooting time on the morning of each hunting day. The hunting permit must be in possession of the hunter while in the field, and hunters must return their permits and report hunting results at the check station by 4:30 PM.

Teal Island

Teal Island is open to hunting Wednesdays, Saturdays, Sundays, holidays and the opening and closing days during the prescribed open season as per Section 3681 of the California Fish and Game code. Teal Island is designated as boat in access only. Hunting is permitted from the levees or from a boat blind. Teal Island may not be accessed for hunting from the Hookton Slough non-motorized boat dock; Fields Landing is the nearest public boat launch.

Jacoby Creek Unit

Jacoby Creek is open to free roam hunting 7 days a week, but the property is designated as boat in access only. No parking is allowed on FWS property. No trespass onto the banks of Jacoby Creek is permitted. Parking along Highway 101 is not recommended and the FWS assumes no responsibility or liability for hunters that choose to park along Highway 101. The Arcata Marsh has the closest public boat launching point.

Eureka Slough Unit

The Eureka Slough Unit is open to free roam hunting 7 days a week, but the property is boat in access only. Woodley Island Marina or the launch behind Target department store are the nearest public boat launches.

Table Bluff Unit

Table Bluff Unit is open to free roam hunting 7 days a week. Hunters may access the area either by boat or by walking in.

White Slough/Egret Island Unit

This area is open to hunting Wednesdays, Saturdays, Sundays, holidays and the

opening and closing days during the prescribed open season as per Section 3681 of the California Fish and Game code. White Slough and Egret Island are designated as boat in access only; Fields Landing is the nearest public boat launch. Hunting and retrieval are allowed on all of the salt marsh islands but access and hunting is not allowed on any of the remnant levees or inside the restored salt marsh area dikes and lands inside the dikes. Retrieval is not allowed in the Salmon Creek Unit. Shooting is not allowed within 150 yards of Highway 101 or Tompkins Hill Road.

Hookton Slough Unit

Hookton Slough is open to hunting Wednesdays, Saturdays, Sundays, holidays and the opening and closing days during the prescribed open season as per Section 3681 of the California Fish and Game code. Hookton Slough is designated as boat in access only. Boat access for hunting is not allowed from the Hookton Slough non-motorized boat dock; Fields Landing is the nearest public entry point. No shooting is allowed within 150 yards of the Hookton Slough non-motorized boat dock. All other areas of Hookton Slough Unit are closed to hunting.

Fernstrom-Root Island (Ma-le'l Dunes Unit)

Concurrent with the implementation of the Ma-le'l Dunes Cooperative Management Agreement, Fernstrom-Root Island is open to hunting 7 days a week. Hunting but no blind construction is allowed on the portion of the Fernstrom-Root Island owned by the Service. Areas of Ma-le'l Island within the Service's jurisdiction are designated as retrieval only areas. Hunters can access Mad River Slough from the boat ramp on Lanphere Road and from Samoa Boulevard to reach Fernstrom-Root Island.

When would the use be conducted?

The waterfowl hunt program at HBNWR takes place during the normal State waterfowl hunting season, typically lasting 100 to 107 days, usually from the third weekend in October to the last weekend in January as set by the State Commission in accordance with Federal guidelines. Hunting would continue to follow the State waterfowl season.

How would the use be conducted?

Hunting would be permitted in accordance with State and Federal regulations and seasons. The specific hunter registration and selection process is as follows:

Hunter Application and Registration Procedures at Salmon Creek Unit

A permit is required to hunt at the Salmon Creek Unit. The refuge check station opens 2 hours before Eureka legal shoot time. A random drawing for available permits takes place at the check station 1 ½ hours prior to shoot time before each daily hunt. Hunters must be present to be eligible for the draw. The refuge's controlled waterfowl hunt is operated under the Recreation Fee Program. Junior hunters (age 17

and under) must be accompanied by an adult who will assume legal responsibility of the junior hunter.

Description of Hunter Selection Process at Salmon Creek Unit

Sign in procedure:

Waterfowl hunters or groups of hunters are required to sign in at the check station in order to participate in that day's hunt. Hunters must be present to participate in the lottery draw. When the lottery draw is complete and the numbers are posted, the check station attendant will begin filling blinds and checking in hunters in the order of the lottery draw. These numbers are also used to prioritize re-filling blinds. Hunters must present a completed permit card and their hunting license to the check station attendant. The permit must have the assigned blind number written on the permit to be valid. Hunters must have an affixed State duck stamp, an affixed HIP program stamp and be in possession of a Federal duck stamp signed by the hunter in order to hunt.

Joining up:

The first fourteen (14) lottery numbers drawn may join with any other of the first fourteen (14) draws as long as there are no more than four (4) hunters per blind. Waterfowl hunters or groups of hunters chosen after the first fourteen (14) must wait until their number is called in order to pair with other hunters. The check station attendant will continue to call numbers until all blinds are occupied. Once all blinds are occupied, no more numbers will be called.

Re-filling:

The check station attendant will assign priority numbers for re-filling available blinds based on the morning random draw and those present. Hunters must be present in order to maintain their position from the morning draw. If a hunter was not present at the morning draw they would sign in according to the "sign in procedures". Hunters would then be given a re-fill number after all other priority hunters have either taken a blind or declined to accept a blind.

When a blind has been vacated by all hunters and those hunters have checked out with the check station attendant, the blind is available to be re-filled. Re-fill one has the option of taking the blind or not taking the blind without losing position in line. If re-fill one does not take an available blind, the choice goes to priority two with the same options, so on and so forth.

Use of hunting dogs for retrieval of birds is allowed and strongly encouraged, however dogs must be under control of their owners at all times. Failure to follow any State, Federal or refuge-specific regulations may result in eviction from the refuge or a citation.

A mobility-impaired ("disabled") blind is available for mobility-impaired hunters. A "mobility-impaired hunter" is defined as: Any person who has been issued a "DMV Disabled license plate, or a permanent parking placard identification card," or a valid

"Mobility Impaired Disabled Persons Motor Vehicle Hunting License" (FG form 1460). The blue plastic "Disabled Parking Placard" may not be substituted for the required "Identification card" which bears the name of the mobility-impaired person. Disabled hunters must provide the registration certificate for DMV issued disabled license plates.

Hunting is permitted from designated blind zones. Free roam hunting is not allowed. Hunters are required to remain within designated blind zones, except for retrieving downed birds. Hunter may take their firearms while retrieving downed birds, but no active hunting is allowed when outside of the designated blind zone. Firearms must be unloaded while being transported between parking areas and hunting sites. A firearm is deemed loaded when there is a live cartridge or shell in, or attached in any manner to, the firearm, including, but not limited to, the firing chamber, magazine, or clip thereof attached to the firearm. (Penal Code & 12031(g)).

Hunter Procedures at Other Refuge Units

Procedures at other units are free roam hunting in accordance with State regulations and unit specific refuge regulations as described above and in the Humboldt Bay NWR Sport Hunting Plan (Appendix C of the CCP).

Why is this use being proposed or reevaluated?

Hunting is one of the six wildlife-dependent general public uses that is given special consideration in refuge planning and management. When determined to be compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge. The National Wildlife Refuge System Administration Act of 1966 strongly encourages refuges to facilitate priority public uses. The specifics of hunting at Humboldt Bay National Wildlife Refuge are being reevaluated because habitat restoration has changed the land type of a huntable unit. The description of the White Slough unit has been updated to reflect this restoration. There are no changes to the hunting program.

Availability of Resources

The estimated annual cost to administer the hunt program is $25,500. Within the annual refuge budget the necessary funds are available for this work. The refuge also participates in the Recreational Fee Program, which offsets some costs of the hunting program.

To regulate the hunting activities on the refuge the following staffing and equipment would be required:

Equipment

Type of Equipment	Explanation of Need	Cost
Pit blind modification	Prevent strandings of wildlife	$500
Modify harvest record card	Improve hunt program record keeping	$500
Sign posting/improvement	Educate public	$1000

Maps/brochures	Improve interpretation and outreach	$1000
Total Cost for Equipment (one time cost)		**$3000**

Staffing

Position	Involvement	FTE	Cost
Project Leader	General Oversight& budget	.05	$2.5k
Assistant Refuge Manager	Periodic on-site oversight	.05	$2.5k
Heavy Equipment Operator	Hunt Area management/maintenance	.05	$2.5k
Visitor Service Assistant	Planning and implementation of Hunt Program	.2	$5k
Law Enforcement Officer		.05	$2.5k
Temporary hire	Staff hunt check station	.2	$7.5k
Total FTE and Costs for Staffing		**.6**	**$25.5k**

Based on the refuge's current staffing level, adequate staff to patrol and monitor waterfowl hunting activity on the refuge is available to support the proposed use.

Anticipated Impacts of the Use

Potential impacts of a proposed use on the refuge's purpose(s) and the Refuge System mission

The hunting of geese, ducks, coots, common moorhens, and snipe would be allowed under the refuge's Hunt Program. Direct effects of hunting include mortality, wounding, and disturbance (DeLong 2002). Hunting can alter behavior (i.e. foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartelt 1987, Madsen 1985, and Cole and Knight 1990). There also appears to be an inverse relationship between the numbers of birds using an area and hunting intensity (DeLong 2002). In Connecticut, lesser scaup were observed to forage less in areas that were heavily hunted (Cronan 1957). In California, the numbers of northern pintails on Sacramento Refuge non-hunt areas increased after the first week of hunting and remained high until the season was over in early January (Heitmeyer and Raveling 1988). Following the close of hunting season, ducks generally increased their use of the hunt area; however, use was lower than before the hunting season began. Human disturbance associated with hunting includes loud noises and rapid movements, such as those produced by shotguns and boats powered by outboard motors. This disturbance, especially when repeated over a period of time, compels waterfowl to change food habits, feed only at night, lose weight, or desert feeding areas (Madsen 1995, Wolder 1993).

These impacts can be reduced by the presence of adjacent sanctuary areas including adjacent wetlands and pastures, the White Slough, Hookton Slough and Salmon Creek Unit Closed Zones, and the Ma-le'l Dunes Unit closed zones where hunting does not

occur and birds can feed and rest relatively undisturbed. Sanctuaries or non-hunt areas have been identified as the most common solution to disturbance problems caused from hunting (Havera et. al 1992). Prolonged and extensive disturbances may cause large numbers of waterfowl to leave disturbed areas and migrate elsewhere (Madsen 1995, Paulus 1984). In Denmark, hunting disturbance effects were experimentally tested by establishing two sanctuaries (Madsen 1995). Over a 5-year period, these sanctuaries became two of the most important staging areas for coastal waterfowl. Numbers of dabbling ducks and geese increased 4 to 20 fold within the sanctuary (Madsen 1995). Thus, sanctuary and non-hunt areas are very important to minimize disturbance to waterfowl populations to ensure their continued use of the refuges.

Intermittent hunting can also be a means of minimizing disturbance, especially if rest periods in between hunting events are weeks rather than days (Fox and Madsen 1997). It is common for refuges to manage hunt programs with non-hunt days. At Sacramento Refuge, 3-16 percent of pintails were located on hunted units during non-hunt days, but were almost entirely absent in those same units on hunt days (Wolder 1993). In addition, northern pintails, American wigeon, and northern shovelers decreased time spent feeding on days when hunting occurred on public shooting areas, as compared to non-hunt days (Heitmeyer and Raveling 1988). The intermittent hunting per week at Sacramento Refuge results in lower pintail densities on hunt areas during non-hunt days than non-hunt areas (Wolder 1993). However, intermittent hunting may not always greatly reduce hunting impacts.

Short-term impacts

Hunting will have a number of short-term impacts on refuge resources. Three impacts we expect are minor damage to vegetation, increased amounts of litter, and some minor disturbance to wildlife by dogs used for retrieval purposes. Other wildlife may be present and hunting will disturb some of them. The impacts will be minor given the percentage of refuge lands open to hunting is only approximately 20 percent; hunters are spaced apart and restricted in their movements at the Salmon Creek Unit, which receives the most impact; and the limiting of hunting days to two per week at the Salmon Creek Unit and three per week at the Hookton Slough and White Slough Units.

Long-term impacts

Recreational hunting will remove individual animals but does not typically have a significant negative effect on wildlife populations. To ensure that populations are sustainable, the Service, state wildlife agencies, and federal and provincial governments in Canada have long-term cooperative programs that monitor breeding-population status, harvest levels, production, migration, and other parameters utilized for regulating waterfowl harvests, managing the populations at the flyway level (rather than refuge by refuge). The process of regulating harvests

involves a lengthy sequence of public involvement and decision making and participation by the Service, state wildlife agencies, and the Canadian and Mexican governments. It culminates in regulations being set at the flyway level (season lengths, daily bag limits, and outside dates for the earliest opening and latest closing dates for a hunting season) and special regulations at the state level (e.g., split seasons, harvest zones, special seasons, area closures).

The Service does not expect waterfowl hunting to have an adverse effect on the long-term sustainability of migratory bird populations that are hunted. All of the specific regulatory decisions on hunting migratory birds are revisited annually and the regulations are adjusted based on the observed status and trends of the species/population at issue. Thus, changes in species status due to hunting and factors other than hunting (e.g., climate change, disease, catastrophic weather events) would be taken into account and addressed in the subsequent year's hunting regulations. Therefore, the Service has concluded that waterfowl hunting on NWRs does not constitute a significant cumulative effect on waterfowl populations.

Based on the above, the anticipated waterfowl harvest from the refuge hunting program will have negligible cumulative effects on overall populations of waterfowl and other non-target species. An adequate amount of non-hunting areas will be maintained to support current refuge waterfowl populations and to withstand the cumulative effects of off-refuge hunting programs.

The proposed hunt program is intended to minimize conflicts with other wetland-dependent species (e.g. special status species) through education, monitoring and limiting hunt days and times. Potential biological conflicts include flushing other migratory and resident birds from areas being hunted or the take of nontarget species either by mistake or willfully. Minor adverse impacts to wildlife or habitats are anticipated from dogs used for retrieval since they will be under the control of their owners at almost all times.

Because Humboldt Bay is a shared waterway, conflicts may arise among hunters and recreational boaters or anglers. However, conflicts among those users should be minimal. Hunting, including the sound of gunfire, does disturb some of our residential neighbors and other refuge users, but we attempt to mitigate that by outreach and by restricting the days and times when we permit hunting. We work with other local, state, and federal law enforcement organizations to provide an increased presence during the hunting season.

Public Review and Comment

This draft compatibility determination contains no changes to the Hunt Program at Humboldt Bay NWR. The only reason for the updated CD is to update the description of where hunting is and is not allowed in a huntable unit that was restored in 2022. Because the update is so minor, this draft CD will be posted at the Refuge office for 5 days. Any comments from the public will be considered in the Final version of this

CD.

Determination

Is the use compatible?

Yes

Stipulations Necessary to Ensure Compatibility

Waterfowl hunting programs have been conducted for many years and the special regulations, restrictions, and general operations have been structured to ensure compatibility. If the monitoring described under Availability of Resources indicates that this use materially interferes with or detracts from fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge, we would curtail or eliminate the use. The hunting of geese, ducks, coots, common moorhens and snipe during the waterfowl season as determined by the State on designated areas of the refuge is subject to the following conditions:

1. Hunters must possess a valid hunting license, an affixed State duck stamp, a signed Federal duck stamp and an affixed Harvest Information Program (HIP) stamp.
2. Hunting hours will coincide with California State Regulations.
3. Non-Toxic shot is required on all refuge units. Shot size is restricted to no larger than “T” for steel shot and “BB” for all other non-toxic shot.
4. Only firearms meeting California State regulations and Department of Fish and Game Regulations relating to waterfowl hunting (DF&G Code Section 507 (a)) are permitted.
5. No person may build or maintain fires.
6. When not hunting, dogs must be in vehicles or on a leash and kept under control at all times. Dogs are not allowed to enter closed areas for any reason.
7. Hunters may use only portable blinds or temporary blinds constructed of natural materials. Hunters must dismantle or remove all blinds from the refuge after each days hunt. No cutting or removal of vegetation for blind construction or for making trails is permitted.
8. Vehicle parking is permitted only in designated areas.
9. Hunters must remove all decoys, shotshell casings and other personal equipment from the refuge following each day’s hunt. Littering is unlawful.
10. Possession or use of alcohol is prohibited on National Wildlife Refuges.
11. The refuge will annually review all hunting activities and operations to ensure compliance with all applicable laws, regulations, and policies.

12. Refuge specific hunting information will be available via brochures and the refuge website. F-28 September 2009 Humboldt Bay NWR Complex—Comprehensive Conservation Plan APPENDIX F.
13. The refuge staff will monitor hunting activity in the field to assure that it does not interfere with other wildlife-dependent uses.
14. Commercialized guiding is not allowed.
15. Access is by foot or boat only. Bicycles or other conveyances are not allowed. Mobility impaired hunters should consult with the Refuge Manager for allowed conveyances.

Justification

The National Wildlife Refuge System Improvement Act of 1997 (Pub. L. 105-57) identifies six legitimate and appropriate uses of wildlife refuges: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Where these uses have been determined compatible, they are to receive enhanced consideration over other uses in planning and management.

Migratory waterfowl hunting will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. The Migratory Bird Conservation Act of 1929, which established inviolate sanctuaries, was amended by the National Wildlife Refuge System Administration Act of 1966. This amendment authorized up to 40 percent of an area acquire for a migratory bird sanctuary to be opened to migratory bird hunting.

Signature of Determination

Refuge Manager Signature and Date

Signature of Concurrence

Assistant Regional Director Signature and Date

Mandatory Reevaluation Date

2038

Literature Cited/References

Bartelt, G.A. 1987. Effects of disturbance and hunting on the behavior of Canada goose family groups in east central Wisconsin. J. Wildl. Manage. 51:517-522.

Cole, D.N., and R.L. Knight. 1990. Impacts of recreation on biodiversity in wilderness. Utah State University, Logan, Utah.

Cronan, J.M. 1957. Food and feeding habits of the scaups in Connecticut waters. Auk 74(4):459-468.

DeLong, A. 2002. Managing Visitor Use & Disturbance of Waterbirds. A Literature Review of Impacts and Mitigation Measures.

Fox, A.D., and J. Madsen. 1997. Behavioral and distributional effects of hunting disturbance on waterbirds in Europe: implications for refuge design. J. Appl. Ecol. 34:1-13.

Havera, S.P., L.R. Boens, M.M. Georgi, and R.T. Shealy. 1992. Human disturbance of waterfowl on Keokuk Pool, Mississippi River. Wildl. Soc. Bull. 20:290-298.

Humboldt Bay NWR Complex—Comprehensive Conservation Plan September 2009 F-29

Heitmeyer, M.E., and D.G. Raveling. 1988. Winter resource use by three species of dabbling ducks in California. Dept. Wildlife and Fisheries Biology, Univ. of Calif., Davis. Final Report to Delta Waterfowl and Wetlands Research Center, Portage La Prairie, Manitoba, Canada. 200pp.

Madsen, J. 1985. Impact of disturbance on field utilization of pink-footed geese in West Jutland, Denmark. Biol. Conserv. 33:53-63.

Madsen, J. 1995. Impacts of disturbance on migratory waterfowl. Ibis 137:S67-S74.

Owens, N.W. 1977. Responses of wintering brant geese to human disturbance. Wildfowl 28:5-14.

Paulus, S.L. 1984. Activity budgets of nonbreeding gadwalls in Louisiana. J. Wildl. Manage. 48:371-380.

Raveling, D.G. 1979. The annual cycle of body composition of Canada geese with special reference to control of reproduction. Auk 96:234-252.

Thomas, V.G. 1983. Spring migration: the prelude to goose reproduction and a review of its implication. In Fourth Western Hemispheric Waterfowl and Waterbird Symposium, ed., H. Boyd. 73-81. Ottawa, Canada: Canadian Wildlife Service.

White-Robinson, R. 1982. Inland and salt marsh feeding of wintering brent geese in Essex. Wildfowl 33:113-118.

Wolder, M. 1993. Disturbance of wintering northern pintails at Sacramento National Wildlife Refuge, California. M. S. Thesis, Humboldt State Univ., Arcata. 62pp.