

June 23, 2000

Rachel Marino
Environmental Branch Chief
United States Coast Guard
Civil Engineering Unit Providence
300 Metro Center Blvd.
Warwick, RI 02886

Dear Ms. Marino:

The U.S. Fish and Wildlife Service (Service) has reviewed the “application for approval of marine event”, submitted by the Town of Barnstable to the U.S. Coast Guard, for a marine-related fireworks event in Hyannis, Massachusetts on July 2, 2000. Your June 14, 2000 request for formal consultation on the application was received on June 15, 2000. This document represents the Service's Biological Opinion on the effects of the action on the federally-threatened piping plover (*Charadrius melodus*) in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

This Biological Opinion is based on information provided in your June 14, 2000, letter describing the proposed project and requesting initiation of formal consultation. It is also based on discussions among your agency, my staff, the Towns of Barnstable and Yarmouth, and the Massachusetts Audubon Society Coastal Waterbird Program (MASCWP), as well as documentation provided by the Towns of Barnstable and Yarmouth.

CONSULTATION HISTORY

May 25, 2000 - Telephone conversation between Deputy Chief W. Green of the Yarmouth Fire Department and Susi von Oettingen, U.S. Fish and Wildlife Service, New England Field Office (NEFO). Deputy Chief Green indicated that the Town of Barnstable had applied for a U.S. Coast Guard marine events permit for fireworks to be discharged from a location less than 3/4 mile from nesting piping plovers.

May 26, 2000 - Telephone conversation between M. Bailey of the MASCWP and Susi von Oettingen, NEFO, discussing beaches with breeding piping plovers that might be affected by the fireworks event.

May 26, 2000 - Telephone conversation between Deputy Chief W. Green and Susi von Oettingen, NEFO, confirming the Town of Yarmouth's commitment to protecting piping plovers on Yarmouth beaches that might be affected by the fireworks event.

June 2, 2000 - The NEFO received a facsimile from the Yarmouth Fire Department describing measures the Town will take to protect and observe piping plovers on beaches affected by the fireworks event.

June 7, 2000 - The NEFO received a letter from T. Geiler of the Town of Barnstable, Department of Health, Safety and Environmental Services describing proposed measures to protect piping plovers on Kalmus Beach that may be affected by the fireworks event.

June 7, 2000 - M. Bailey of the MASCWP provided current piping plover data on all beaches in the Towns of Barnstable and Yarmouth that might be affected by the fireworks event.

BIOLOGICAL OPINION

Description of the Proposed Action

As defined in 50 CFR 402.02, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas. The "action area" is defined as all areas to be affected directly or indirectly by the federal action, and not merely the immediate area involved in the action. The direct and indirect effects of the actions and activities resulting from the federal action must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

The proposed action is the discharge of fireworks from a barge located in the Hyannis Outer Harbor/Lewis Bay in Massachusetts on July 2, 2000 or July 3, 2000 (rain date). Approximately 1,360 shells ranging from 3" to 12" will be detonated between 9 p.m. and 9:30 p.m. The barge will be anchored northeast of Kalmus Beach, northwest of Smith's Point and the "causeway" of Great Island, and southwest of Sea Gull Beach, all known plover beaches. The action area includes all of Kalmus Beach, Sea Gull Beach, Smith's Point and the causeway at Great Island.

Spectator management

It is anticipated that the fireworks event will draw at least 75,000 spectators to the Towns of Barnstable and Yarmouth. Spectators will be encouraged to view the fireworks event from beaches other than those with nesting piping plovers and from harbor areas in Hyannis and Yarmouth. The fireworks may be viewed from approximately 500 boats in the Hyannis Harbor/Lewis Bay area.

The Towns of Barnstable and Yarmouth (sponsors of the fireworks event) will undertake the following actions to prevent spectators observing the fireworks from disturbing piping plovers.

Kalmus Beach, Barnstable

In the past, an estimated 5,000 to 8,000 spectators attended the fireworks at Kalmus Beach. This year, the Town of Barnstable anticipates fewer spectators at Kalmus Beach since people wishing to view the fireworks from the unrestricted portion of Kalmus Beach will be directed to parking areas on Main Street and required to walk to the beach.

The piping plover and tern nesting area of Kalmus Beach is permanently fenced to prevent pedestrian and vehicle access. Additional measures that will be implemented during the fireworks event are:

1. Snow fencing will be installed from the northern end of the bath house and will extend northeasterly to the water.
2. Safety and maintenance patrols will be restricted to the area between the permanent fence and the snow fence.
3. Vehicular traffic will be prohibited from entering the protected area, with the exception of emergency vehicles. The emergency vehicle gate will be locked and may only be used in the event of an emergency.
4. The parking lot at Kalmus Beach will be closed.
5. The Barnstable harbormaster will provide staff to patrol the offshore area to prevent boats from landing on Kalmus Beach.
6. Staff provided by the MASCWP will monitor piping plovers prior to and following the fireworks event. MASCWP staff will also monitor piping plovers the day of the event and will collect observational data on piping plovers during and after the event.

Sea Gull Beach, West Yarmouth

The nesting area at Sea Gull Beach will be closed to spectators. Town of Yarmouth and MASCWP staff will be present to prevent spectators from entering the area. Plovers will be monitored prior to, during and after the fireworks event.

Great Island Causeway, West Yarmouth

Private security officers of the Great Island Homeowners Association will restrict owners and guests from entering the fenced piping plover area. The general public is not allowed access to the causeway. Plovers will be monitored prior to and after the fireworks event.

Smith's Point at Great Island, West Yarmouth

Private security officers of the Great Island Homeowners Association will restrict owners and guests from entering the fenced piping plover area and will provide a boat patrol to prevent boats from landing at Smith's Point. Staff provided by the MASCWP will monitor piping plovers prior to and following the fireworks event. MASCWP staff will also monitor piping plovers the day of the event and will collect observational data on piping plovers during and after the event.

For the purposes of this Biological Opinion, these additional protective measures have been incorporated into the project description, and are included in the Service's evaluation of the effects of the action.

Status of the Species/Critical Habitat Likely to be Affected

Most of the following information on piping plover habitat requirements, life history and threats was taken from the Service's revised recovery plan (U.S. Fish and Wildlife Service 1996).

Species description and life history

Piping plovers are small, sand-colored shorebirds approximately seven inches long with a wing span of approximately 15 inches (U.S. Fish and Wildlife Service 1996). The Service recognizes three distinct populations: the Atlantic Coast population, the Great Lakes population and the Northern Great Plains population. The Atlantic Coast population of piping plovers breeds on coastal beaches from Newfoundland to North Carolina and occasionally South Carolina, and winters along the Atlantic Coast from North Carolina south, along the Gulf Coast, and in the Caribbean (U.S. Fish and Wildlife Service 1996).

Usually, piping plovers begin returning to their Atlantic Coast nesting beaches in mid-March (Cross 1990, Goldin et al. 1990, MacIvor 1990, Hake 1993, U.S. Fish and Wildlife Service 1996). Piping plovers have been documented returning as early as February 24 in Virginia (Cross 1991), March 15 in Massachusetts (MacIvor 1990), and March 28 in Nova Scotia (Cairns 1977). By early April, males begin to establish and defend territories and court females (U.S. Fish and Wildlife Service 1996). Piping

plovers are monogamous, but may change mates each year (Wilcox 1959, Haig and Oring 1988, MacIvor 1990), and less frequently between nesting attempts in a given year (Haig and Oring 1988, MacIvor 1990, Strauss 1990). Plovers can breed at one year of age (MacIvor 1990), but the percentage of plovers breeding at this age is unknown.

Piping plover nests are situated above the high tide line on coastal beaches, sand flats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, and washover areas cut into or between dunes. Nesting may also occur on areas where suitable dredge material has been deposited. Nest sites are shallow scraped depressions in substrates ranging from fine-grained sand to mixtures of sand and pebbles, shells or cobble. Nests are usually found in areas with little or no vegetation, although piping plovers will nest occasionally under stands of American beachgrass or other vegetation. Clutch size is typically four eggs that are usually incubated for 27-28 days before hatching (U.S. Fish and Wildlife Service 1996). Piping plovers generally fledge only a single brood per season, but may re-nest several times if previous nests are lost.

Piping plover chicks are precocial¹ and may move hundreds of yards from the nest site during their first week of life. Adults lead the chicks to and from feeding areas, shelter them from harsh weather and protect young from predators. Jones (1997) studied piping plovers at the Cape Cod National Seashore in Massachusetts and observed that mean home range length was 486 meters (ranged from 152 to 1210 meters).

Chicks remain with one or both parents until they fledge at 25 to 35 days of age. Depending on the date of hatching, unfledged chicks may be present on beaches from late May through mid-August, although most have fledged by late July or early August.

Status and distribution

Loss and degradation of habitat due to development and shoreline stabilization projects have been major contributors to the species' decline. Disturbance by humans and pets often reduces the functional suitability of habitat and causes direct and indirect mortality of eggs and chicks. Predation has also been identified as a major factor limiting piping plover reproductive success at many Atlantic Coast sites, and substantial evidence shows that human activities are affecting types, numbers, and activity patterns of predators, thereby exacerbating natural predation (U.S. Fish and Wildlife Service 1996; Hecht and Nickerson 1999).

Inasmuch as pressure on Atlantic Coast beach habitat from development and human disturbance is pervasive and unrelenting, the recovery of the Atlantic Coast piping plover population is occurring in the context of an extremely intensive protection effort being implemented on an annual basis. Since being listed as threatened in 1986 (U.S. Fish and Wildlife Service 1985), the Atlantic Coast population has

¹Precocial birds are mobile and capable of foraging for themselves within several hours of hatching.

increased from approximately 800 pairs to almost 1,400 pairs in 1999 (Table 1). The initial increase between 1986 and 1989 is attributable to increased survey efforts in two states, whereas the increase between 1989 and 1996 reflects real population growth

Table 1. Summary of Atlantic Coast Piping Plover Population Estimates, 1986 to 1999 (numbers in bold are preliminary estimates).

STATE/REGION	PAIRS														Goal
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	
Maine	15	12	20	16	17	18	24	32	35	40	60	47	60	56	
New Hampshire	-	-	-	-	-	-	-	-	-	-	-	5	5	6	
Massachusetts	139	126	134	137	139	160	213	289	352	441	454	490	495	505	
Rhode Island	10	17	19	19	28	26	20	31	32	40	50	51	46	41	
Connecticut	20	24	27	34	43	36	40	24	30	31	26	26	21	22	
NEW ENGLAND	184	179	200	206	227	240	297	376	449	552	590	619	627	630	625
New York	106 ^a	135 ^a	172 ^a	191	197	191	187	193	209	249	256	256	245	243	
New Jersey	102 ^b	93 ^b	105 ^b	128	126	126	134	127	124	132	127	115	93	107	
NY-NJ REGION	208	228	277	319	323	317	321	320	333	381	383	371	338	350	575
Delaware	8	7	3	3	6	5	2	2	4	5	6	4	6	4	
Maryland	17	23	25	20	14	17	24	19	32	44	61 ^e	60	56	58	
Virginia	100	100	103	121	125	131	97	106	96	118	87	88	95	89	
North Carolina	30 ^c	30 ^c	40 ^c	55	55	40	49	53	54	50	35	52	46	31	
South Carolina	3	-	-	-	1	1	-	1	-	-	0	-	-	-	
SOUTHERN REGION	158	160	171	199	201	194	172	181	186	217	189	204	203	182	400
U.S. TOTAL	550	567	648	724	751	751	790	877	968	1150	1162	1194	1168	1163	1600
ATLANTIC CANADA	240	223	238	233	229	236	236 ^d	236 ^d	182	199	186	197 ^f	204	230	400
ATLANTIC COAST	790	790	886	957	980	987	1026	1113	1150	1349	1348	1391	1372	1393	2000

Table 1, continued:

- ^a The recovery team believes that this estimate reflects incomplete survey effort. See discussion on page 22 of the Atlantic Coast Piping Plover Revised Recovery Plan (U.S. Fish and Wildlife Service 1996).
- ^b The New Jersey plover coordinator conjectures that one quarter to one third of the apparent population increase between 1986 and 1989 is due to increased survey effort.
- ^c The recovery team believes that the apparent 1986-1989 increase in the North Carolina population is due to intensified survey effort. See discussion on page 22 of the recovery plan (U.S. Fish and Wildlife Service 1996). No actual surveys were made in 1987; estimate is that from 1986.
- ^d 1991 estimate.
- ^e Reflects correction in 1996 Maryland population from 60 pairs reported in 1996 Status Update to 61 pairs.
- ^f Assumes that there were 11 pairs in Newfoundland in 1997, the same as 1996; Newfoundland reported 35 adults in 1997, up from 27 in 1996, but provided no 1997 estimate for breeding pairs.

due to increased management and protection. However, the latter increase has been unevenly distributed, with the greatest proportion of population gain centered in the New England states. Since 1996, the rate of population growth has slowed considerably, primarily due to a smaller increase in the overall numbers of piping plover pairs in the New England region and a decrease in pairs in the New York/New Jersey and Southern regions (Table 1).

In an effort to obtain a more even distribution of the Atlantic Coast piping plover population for recovery purposes, four recovery units were developed: Atlantic Canada, New England, New York-New Jersey, and Southern. Current information indicates that most Atlantic Coast piping plovers nest within their natal region, that regional population trends are related to regional productivity, and that intense regional protection efforts contribute to increases in regional piping plover numbers (U.S. Fish and Wildlife Service 1996). However, some dispersal is ongoing within the Atlantic Coast piping plover population, and recovery units do not represent biologically distinct population segments under the Endangered Species Act (U.S. Fish and Wildlife Service 1996).

Between 1989 and 1999, the New England recovery unit increased by 424 pairs, while the New York-New Jersey recovery unit gained 31 pairs and the Southern (DE-MD-VA-NC) recovery unit lost 17 pairs (although in 1995 this recovery unit had a gain of 18 pairs). Between 1989 and 1999, the Atlantic Canada recovery unit experienced a net decline of three pairs. The 1999 preliminary estimate of 1.43 chicks per pair in the United States portion of the Atlantic Coast piping plover population is below the recovery objective for average productivity of 1.50 chicks/pair. Since 1990, substantially higher productivity rates have been observed in New England than elsewhere in the population's range (with the exception of 1990, 1996 and 1997).

The revised recovery plan for the Atlantic Coast piping plover (U.S. Fish and Wildlife Service 1996) identifies a recovery objective for delisting the species, as well as five criteria for meeting the recovery objective. The overall objective is to ensure the long-term viability of the Atlantic Coast plover population in the wild. Delisting of the Atlantic Coast piping plover population may be considered when the following criteria have been met:

- attainment and maintenance for five years of a total of 2,000 breeding pairs, distributed among four recovery units;
- verification of the adequacy of a 2,000-pair population of piping plovers to maintain heterozygosity and allelic diversity over the long term;
- achievement of a five-year average productivity of 1.5 fledged chicks per pair in each of the recovery units;
- implementation of long-term agreements to assure protection and management sufficient to maintain the population targets and average productivity in each recovery unit;

- assurance of long-term maintenance of wintering habitat, sufficient in quantity, quality, and distribution to maintain survival rates for a 2,000-pair population.

The recovery plan sets the New England Recovery Unit goal at a minimum of 625 pairs. The preliminary estimate for 1999 (Hecht *in litt.* 2000) indicates there were 631 pairs of piping plovers in New England, exceeding the recovery goal by six pairs. Service guidelines for the preparation and evaluation of conservation plans for the Atlantic Coast piping plover (Appendix H of the revised recovery plan) recommend that permits for incidental take should only be issued in recovery units that have met 70% of the unit's recovery goal. The New England Recovery Unit has exceeded this criterion for two consecutive years (1998 and 1999), even though the average productivity declined in recent years.

Environmental Baseline

Status of Piping Plovers in Massachusetts

The Massachusetts population of piping plovers increased by 400% during the past eight years, from 126 pairs in 1987 to 505 pairs in 1999. The 1999 Massachusetts population comprised approximately 36% of the Atlantic Coast population, and 80% of the New England population.

One of the recovery criteria for delisting the Atlantic Coast piping plover establishes a five-year average of 1.5 chicks fledged per pair for each recovery unit. The New England Recovery Unit, and especially Massachusetts, has had consistently higher productivity rates than elsewhere in the population's range. Massachusetts' average annual reproductive success ranged from 1.33 to 2.03 chicks fledged per pair (this reflects fledge rates reported for more than 90% or more of the statewide population) and has consistently exceeded the annual averages of 1.06 to 1.56 chicks fledged per pair reported for the U.S. Atlantic Coast population.

Massachusetts state guidelines (Massachusetts Division of Fisheries and Wildlife 1993) for managing piping plovers have been in place since 1993, although intensive management of beaches was initiated prior to publication of the guidelines. Management at most sites in the state now conforms to both state and federal guidelines. All current nesting beaches and most historical or potential sites are censused each year, and more than 70% of the major sites are monitored at least three times per week during periods of nesting and brood-rearing. Since 1995, estimates of productivity were obtained for more than 95% of all breeding pairs in the state.

On most Massachusetts beaches where nests are potentially threatened by pedestrian activities, nests are protected with buffer areas enclosed by symbolic fencing and warning signs. Approximately 75% of all nests are protected with wire predator enclosures each year. Management of off-road vehicles at nearly all major beaches conforms to most components of state and federal guidelines. Beginning in early April, and extending until the first egg hatches, off-road vehicles are restricted by the guidelines to discrete travel corridors along the outer edges of suitable plover nesting habitat. The guidelines call for sections of beach where unfledged plover chicks are present to be completely closed to recreational vehicles until chicks reach 35 days of age or are observed in flight. The Massachusetts Wetlands Protection Act has been an

effective regulatory tool during the past four years to protect plover habitat from degradation caused by off-road vehicles and dune building activities.

Status of Piping Plovers in the Action Area

Since 1997, breeding piping plovers ranged from two to four pairs at Kalmus Beach, from three to four pairs at Seagull Beach, and two to three pairs at Smith's Point on Great Island (M. Bailey, Massachusetts Audubon Society Coastal Waterbird Program, pers. comm. 2000). Productivity at these sites has varied from year to year (Table 2). As of June 7, 2000, there were four piping plover nests at Kalmus Beach, all of which should have produced hatchlings by July 2 and three nests at Sea Gull Beach, two of which should have produced hatchlings by July 2. Two pairs of piping plovers were establishing territories at Smith's Point and should have nests with eggs on July 2. Currently, there are no data on the three to four pairs at the causeway on Great Island.

Table 2. Piping plover population and productivity within action area.

	Number pairs/chicks fledged per pair ²				
	Kalmus Beach	Sea Gull Beach	Great Island ³	Causeway	Smith's Point
1997	2 / 1.5	3 / 3	7 / no data	no data	2 / no data
1998	3 / 1.3	4 / 3.25	7 / 1.0	no data	3 / no data
1999	4 / 1.75	3 / 2.3	6 / 2.17	no data	2 / no data
2000	4 / -	3 / -		3 / -	2 / -

Effects of the Action

In evaluating the effects of the federal action under consideration in this consultation, 50 CFR 402.2 and 402.14(g)(3) require the Service to evaluate the direct and indirect effects of the action on the species.

Direct Effects

Direct adverse effects from fireworks result from the associated noise, lights and rarely, accidental wildfires. Direct injury can be caused by the explosions or debris fallout. Moreover, piping plovers and terns (which often nest adjacent to or near plovers) may abandon their nests and broods during fireworks displays, exposing eggs and chicks to weather and predators. If a flightless chick were to become permanently

²Information provided by M. Bailey, MASCWP.

³Smith's Point and the causeway data included in Great Island data. Population numbers for Smith's Point and the causeway were able to be separated from the total count; however, productivity is based on all pairs on Great Island.

separated from its parents during the disturbance, mortality would be almost certain. The Service has concluded that plovers may be directly affected by fireworks discharged within 3/4 mile of plover nesting and/or foraging areas (U.S. Fish and Wildlife Service 1997). The fireworks event will be located within 1/2 mile of plovers nesting at Smith's Point and slightly less than 1/2 mile from plovers nesting at Kalmus Beach. Although the most serious impacts, including debris fallout, are not anticipated during this event, explosions may disturb plovers, preventing them from foraging and resting, causing temporary or permanent abandonment of nests or possibly separating adults from their young.

Indirect effects are defined as those that are caused by the proposed action that may occur later, but are still reasonably certain to occur (50 CFR 402.02). Commercial fireworks displays typically attract large crowds that may pose threats to nearby plovers, even though these crowds may be situated at some distance from the actual launch site (for example, across an inlet). Spectators at Kalmus and Sea Gull Beaches and associated crowd control activities may indirectly affect piping plovers. These indirect effects may result from spectators walking through and/or throwing objects (including illegal pyrotechnics) into plover nesting and brood-rearing areas, additional off-road vehicle patrols by public safety personnel, and additional trash (which attracts predators). However, most of the indirect effects that potentially could be associated with the proposed action are expected to be avoided as a result of the implementation of the measures proposed by the Towns of Barnstable and Yarmouth (pages 3 and 4).

Cumulative Effects

Cumulative effects include the effects of future state, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of ESA.

For the foreseeable future, increased pedestrian recreation can be expected to occur on Kalmus and Sea Gull Beaches. Currently, beachgoers use the beaches for sunbathing, volleyball, swimming, windsurfing and walking pets. The effects of these activities have been minimized through permanent closure of the plover and tern nesting area at Kalmus Beach, symbolic fencing at Sea Gull Beach and the use of predator enclosures. However, increased recreational use may result in increased disturbance to nesting plovers if not appropriately managed. Smith's Point and the causeway at Great Island are privately owned and access by the public is prohibited. Increase in recreational activity at Great Island (including Smith's Point and the causeway) is expected to be minimal due to the private ownership and restricted public access.

Biological Opinion Conclusion

After reviewing the current status of the Atlantic Coast piping plover in the New England recovery unit, as well as throughout the rest of its range, the environmental baseline for the action area, the effects of the proposed fireworks event, and the cumulative effects, it is the Service's biological opinion that the July 2, 2000 fireworks event as proposed is not likely to jeopardize the continued existence of the Atlantic Coast piping plover population or the New England recovery unit. No critical habitat has been designated for this

species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Endangered Species Act and federal regulations pursuant to Section 4(d) of the Act prohibit the take of threatened or endangered species respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is defined by the Service as an act that actually kills or injures wildlife, and is further defined as significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity conducted by the federal agency or the applicant. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking, provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Coast Guard Marine Event Permit is issued based upon the information about the proposed activity provided by the sponsor in its "Application for Approval of Marine Event". The applicant (Town of Barnstable) has included the statement "The Town has informed the U.S. Fish and Wildlife Service (Service) that we will incorporate whatever measures required by the Service to avoid violation of the Federal Endangered Species Act." Therefore, the measures described below, and made known to the Town, are part of the application that the Coast Guard will consider for approval. It is anticipated that implementation of these measures as part of the proposed activity will result in avoidance of significant environmental impacts. Once approval is granted, the applicant is required to conduct the event in the manner described in the application. If the applicant fails to conduct the activity as described in their approved application, including compliance with the terms and conditions of the incidental take statement issued by the Service, we understand that the Marine Event Permit may be revoked and the protective coverage of Section 7(o)(2) may lapse.

The Service anticipates that incidental take of the federally-threatened piping plover is likely to occur during the fireworks event primarily in the form of harassment and possible egg mortality. The disruption of normal behavior including feeding, resting and/or brooding may result from increased human presence and activity at Kalmus and Sea Gull Beaches. Direct disturbance of plovers by fireworks may occur at Kalmus Beach and Smith's Point since these nesting areas are located within ½ mile of the fireworks discharge area. Plovers may exhibit more alarm behavior and have less opportunity to feed throughout the evening when large shells explode during the fireworks event. If chicks are very young at the time of the event, chick growth rates and/or the number of days to fledging could be adversely affected as a result of the disturbance. For those plovers incubating eggs during the event, the explosions may cause adults to leave the nest for a short time. At Smith's Point, eggs may be lost to predators or may be chilled to the point of

causing mortality.

Due to the protective measures proposed by the Towns of Barnstable and Yarmouth that will restrict spectators from Kalmus Beach, Sea Gull Beach, Smith's Point and the causeway at Great Island, the Service believes that the proposed fireworks event is not likely to **indirectly** adversely affect piping plovers. Therefore, the Service does not anticipate any take associated with indirect effects.

However, it is likely there will be **direct** adverse effects to the approximately four broods and two nests that are within ½ mile of the fireworks discharge site. The Service anticipates that one egg may be lost due to temporary abandonment of the nests within ½ mile of the discharge site. In addition, the Service anticipates "take" in the form of harassment of all chicks, especially those aged 10 days or younger at Kalmus Beach. Piping plover chicks typically triple their weight during their first two weeks after hatching and need to achieve at least 60% of this weight gain by day 12 to ensure a reasonable likelihood of survival (Cairns 1977). We believe that plover chicks using Kalmus Beach will be harassed by fireworks noises and light flashes that may disturb roosting during the event and feeding during and for a period afterwards, potentially delaying weight gain and increasing their vulnerability to mortality.

Reasonable and Prudent Measures

Reasonable and prudent measures are measures considered necessary or appropriate to minimize the amount or extent of anticipated incidental take of the species. Reasonable and prudent measures, along with the terms and conditions that implement them, cannot alter the basic design, location, scope, duration, or limit of the action, and may involve only minor changes.

Pursuant to Section 7(b)(4) of the Endangered Species Act, the Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take:

1. Human activity in the vicinity of plovers at Kalmus Beach, Sea Gull Beach, Smith's Point and the causeway on Great Island must be minimized to reduce adverse effects.
2. Piping plovers must be monitored before, during and after the fireworks event to determine the degree of disturbance. Observational data will be used to review management for future fireworks near Kalmus and Sea Gull Beaches.

Terms and Conditions

Terms and conditions include, but are not limited to, monitoring and reporting requirements that are tailored to the nature of the action and the particular needs of the species involved. These terms and conditions must be incorporated as binding conditions of any permit issued by the USCG. Some of the measures proposed by the Towns of Barnstable and Yarmouth to avoid impacts to piping plovers (pages 3 and 4) generally meet the following terms and conditions. Additional terms and conditions are provided to further avoid and minimize impacts.

1. Piping plover habitats in the vicinity of where spectators may congregate should be intensively surveyed for at least four days prior to the event to locate nests, adult plovers, chicks, and/or post-fledged juveniles.
2. Piping plover habitats should be symbolically fenced in accordance with the Service's *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* (U.S. Fish and Wildlife Service 1994).
3. Parking lots and beach access points in the vicinity of piping plovers must be closed (item #4, page 3).
4. To increase the visibility of the fenced area, symbolic fencing should use either yellow caution tape or temporary snowfencing (item #1, page 3).
5. Adequate numbers (consistent with anticipated numbers of spectators) of monitors and law enforcement personnel in the vicinity of plover breeding areas must be provided to patrol fenced areas from the time when spectators begin congregating on the beach until the crowd disperses after the event. Monitors and enforcement personnel must receive accurate current information about the locations of threatened birds so that they can minimize any disruptions from their own activities.
6. All pets must be prohibited from the beaches during the event.
7. Trash or litter must be removed from the beach immediately following the event. However, any trash located within fenced areas should be left until daylight and then removed by or under the supervision of plover monitors. Further, vehicles should not be used at night to remove trash within 100 meters of unfledged plover chicks.
8. Except when responding to an actual emergency situation, all law enforcement, fire department, public works, fireworks deployment, and other vehicles in the vicinity of breeding plovers should be operated in conformance with the Service's *Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act* (U.S. Fish and Wildlife Service 1994) (items #2 and 3).

Reporting And Monitoring Requirements

The Towns of Barnstable and Yarmouth must provide the Service with a report of the piping plover monitoring activities before, during and after the fireworks event. The contact for these reporting requirements is as follows:

Michael J. Bartlett, Supervisor
New England Field Office
U.S. Fish and Wildlife Service
22 Bridge St., Unit #1
Concord, NH 03301-4986
(603) 225-1411

In order to determine the effectiveness of the terms and conditions, the following should be undertaken:

1. A qualified biologist should determine the location and status of all adult plovers, nests, and chicks within ¼ mile of spectator viewing areas on the day of the event and again on the following day.
2. Counts should be taken of human and dog tracks that intersect the perimeter of symbolically-fenced areas, before and after the event.
3. Counts should be taken of persons actually observed inside symbolically-fenced areas during the event.
4. Counts should be taken of instances of illegal pyrotechnics used on the beach during the event.
5. Counts should be taken of trash/litter items inside symbolically-fenced areas, before and after the event. For very large areas or areas that have substantial amounts of trash before the event, trash counts may be conducted in sample plots.
6. Counts should be taken of breaks in symbolic fences.

Conservation Recommendations

The Service may provide, in conjunction with the Biological Opinion, a statement containing discretionary conservation recommendations. Conservation recommendations are advisory, and are not intended to carry any binding legal force. These recommendations are discretionary agency activities taken to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

In order to assist in the implementation of the recovery program, the Service recommends that plovers at Kalmus Beach, Sea Gull Beach, Smith's Point and the causeway on Great Island continue to be managed consistent with Massachusetts state and Service guidelines for managing piping plovers on recreational beaches (U.S. Fish and Wildlife Service 1994; Massachusetts Division of Fisheries and Wildlife 1993).

Reinitiation Notice

This concludes formal consultation on the federal action outlined in the June 14, 2000 request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, all activities that are causing such take must cease until such time as any necessary consultation is completed in order to avoid violation of Section 9 of the Endangered Species Act.

The Service appreciates the opportunity to work with the USCG in fulfilling our mutual responsibilities under the Endangered Species Act. Please contact Susi von Oettingen of this office at (603) 225-1411 if you have any questions or require additional information.

Sincerely yours,

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