

Mr. Terry M. Potterton
National Aeronautics and Space Administration
Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, Virginia 23337-5099

Colonel Robert H. Reardon, Jr.
U.S. Army Corps of Engineers
803 Front Street
Norfolk, Virginia 23510-1096

Re: Range Operations Expansion at
Wallops Flight Facility, Accomack
County, Virginia

Gentlemen:

The U.S. Fish and Wildlife Service (Service) has reviewed the National Aeronautics and Space Administration's (NASA) proposal to expand range operations at Wallops Flight Facility, Accomack County, Virginia. NASA's April 22, 1997 request for formal consultation was received on April 22, 1997. This document represents the Service's biological opinion on the effects of that action on the piping plover (*Charadrius melodus*), federally listed threatened, in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). A complete administrative record of this consultation is on file in this office.

I. CONSULTATION HISTORY

- 02-27-97 The Service received a copy of the Environmental Assessment for Range Operations Expansion at the NASA Goddard Space Flight Center's Wallops Flight Facility with a cover letter requesting our review regarding federally listed species.
- 04-09-97 The Service sent a letter to NASA providing comments on the Environmental Assessment and indicated that the project, as proposed, may affect the piping plover.
- 04-22-97 The Service met with NASA, the Virginia Department of Game and Inland Fisheries (VDGIF), and the Virginia Commercial Space Flight Authority to discuss the proposed project. NASA provided the Service with a letter regarding their estimate of the piping plover habitat to be impacted by the proposed project.
- 04-22-97 The Service received NASA's request to initiate formal consultation.
- 05-06-97 The Service sent a letter to the Corps indicating that NASA had requested formal consultation and no Corps' permits should be issued for this project until formal

consultation has been completed.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

NASA proposes to enhance national launch capabilities through improvements to infrastructure and expansion of launch range capabilities. The major actions include: (1) establishment of a commercial Spaceport, (2) improvements to infrastructure to support a commercial Spaceport, (3) expanding launch operations to accommodate twelve orbital launches per year, and (4) restoration of the historical level and nature of operations at Wallops Flight Facility. The only action that may affect the piping plover is the use of launch pad 0-B. Construction of launch pad 0-B is proposed and will be used in conjunction with the existing launch pad 0-A to launch no more than twelve orbital launches per year from Wallops Flight Facility in Accomack County, Virginia (Figure 1). NASA has stated that a minimum of 60 to 90 days is required to prepare for a single launch event at one of the two pads.

Pad 0-B will be 19,000 square feet with a 170 foot high service tower. Other equipment will also be attached to this pad to facilitate launch operations. This facility would support the launching of expendable launch vehicles capable of placing small-to-medium payloads into orbit. Vehicle and payload handling within the pad and service tower area will be accomplished by a 75-ton capacity bridge crane. The proposed construction site will impact 1,315 square meters (m) (approximately 1/3 acre) of wetlands. The entire island is located within the 100-year flood plain. As part of the project, NASA has agreed to monitor piping plovers. The monitoring plan is in Appendix A.

Damage to local biological resources resulting from launch activities can be anticipated within a 1,000 m radius of the launch pad. The principal impacts radiate approximately 200 to 300 m within the combustion path. Searing of vegetation and injury or death to fauna can occur within this zone. Interruption of faunal activities is expected within a 1,000 m radius of the launch pad for 2 to 10 minutes during launch operations. The combustion products and initial sound blast will be directed toward the Atlantic Ocean. Launches may be conducted during any time of the year and any time of the day or night.

RANGEWIDE STATUS OF THE SPECIES

Life History

Piping plovers are small beige and white shorebirds with a black band across their breast and forehead. They typically feed on small invertebrates within intertidal surf zones, mud flats, tidal pool edges, barrier flats, and sand flats. The nesting season typically lasts from late April to late July. The nest is a shallow depression in the sand, typically lined with bits of broken seashells or fine pebbles. Incubation lasts for 26 to 30 days and is shared equally by both adults. The chicks leave the nest within hours of hatching

and begin feeding on their own as soon as they can stand. Chicks are defended by the adults and can fly after 28 to 35 days. A more detailed and comprehensive description of the life history of the plover is provided in the recovery plan (U.S. Fish and Wildlife Service 1996).

Status of the Species Within its Range

Piping plovers occur in three disjunct populations in North America: Northern Great Plains, Great Lakes, and Atlantic Coast. The Atlantic Coast piping plover breeds on coastal beaches from Newfoundland to North Carolina (and occasionally South Carolina) and winters along the coast from North Carolina south, along the Gulf Coast and in the Caribbean (U.S. Fish and Wildlife Service 1996). The recovery plan divides the Atlantic Coast population into four recovery units: Atlantic Canada, New England, New York-New Jersey, and Southern (Delaware, Maryland, Virginia, and North Carolina).

Since 1986, the Atlantic Coast population has increased from 790 pairs to 1,347 pairs in 1996. However, most of the apparent increase between 1986 and 1989 is attributable to increased survey effort in two states. In addition, the population increase between 1989 and 1995 was very unevenly distributed. Between 1989 and 1995, the New England subpopulation increased by 346 pairs, while the New York-New Jersey and the Southern subpopulations gained 82 and 16 pairs, respectively, and the Atlantic Canada population decreased by 34 pairs. Substantially higher productivity rates have also been observed in New England than elsewhere in the Atlantic Coast population's range. In 1996, all recovery units either declined or increased less than expected based on 1995 productivity data. The Southern recovery unit declined 13% between 1995 and 1996. This is significant because the recovery plan ties recovery of the species to improved status of all four recovery units. The relative lack of recovery of the Southern subpopulation has heightened concern over any proposed activities which would further impede recovery in this area. Recovery of the Atlantic Coast piping plover population is occurring in the context of an extremely intensive protection effort now being implemented on an annual basis. Pressure on Atlantic Coast beach habitat from development and human disturbance is pervasive and unrelenting, and the species is sparsely distributed (U.S. Fish and Wildlife Service (1996).

In Virginia, piping plovers nest in Accomack and Northampton Counties on the barrier islands and on beaches in the Cities of Hampton and Portsmouth. Between 1989 and 1991, the number of piping plover pairs in Virginia increased from 100 to 131. In 1992, the number of nesting pairs was 97, and since then there have been serious population fluctuations. In 1996, only 87 pairs of plovers were documented. Annual productivity (numbers of chicks fledged/pair) has fluctuated widely, but was relatively high in 1996.

Threats to the Species

Loss and degradation of habitat due to development and shoreline stabilization 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. 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). A more detailed and comprehensive description of threats to the plover is provided in the recovery plan (U.S. Fish and Wildlife Service 1996).

Recovery Goals and Accomplishments

The Atlantic Coast population of the piping plover was listed as threatened in 1986. The primary recovery objective is to remove the Atlantic Coast plover population from the list of Endangered and Threatened Wildlife and Plants by achieving well-distributed increases in numbers and productivity of breeding pairs and providing for long-term protection of breeding and wintering plovers and their habitat. Delisting may be considered when the following criteria have been met: (1) increase and maintain for 5 years a total of 2,000 breeding pairs distributed among four recovery units as follows-- Atlantic Canada, 400 pairs; New England 525 pairs; New York-New Jersey, 575 pairs; Southern, 400 pairs; (2) verify the adequacy of a 2,000-pair population to maintain heterozygosity and allelic diversity over the long-term; (3) achieve five-year average productivity of 1.5 fledged chicks per pair in each recovery unit, based on data from sites that collectively support at least 90% of the recovery unit's population; (4) institute long-term agreements to assure protection and management sufficient to maintain the population targets and average productivity in each recovery unit; and (5) ensure long-term maintenance of wintering habitat, sufficient in quantity, quality, and distribution to maintain survival rates for a 2,000-pair population. At the present time, these criteria are not close to being accomplished.

ENVIRONMENTAL BASELINE

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 Service has determined that the action area for this project is the portion of Wallops Island within 1,207 m (0.75 miles) south of launch pad 0-B.

Status of the Species in the Action Area - Piping plovers have nested at the north and south end of Wallops Island. The plover nesting area on the north end of the island is approximately 7 kilometers from the proposed project site. No impacts are expected to occur to the plovers at the north end of the island and only concerns related to plovers at the south end of the island will be addressed. Information about the plover at the southern end of the island is detailed below.

Wallops Island (Southern End) Piping Plover Data

Year	# Pairs	# Young Fledged	Comments
1986	2	0	
1987	2	3	
1988	0	0	
1989	5	unknown	
1990	5	unknown	
1991	3	unknown	
1992	4	5	1.25 young fledged/pair
1993	3	4	1.33 young fledged/pair
1994	3	2	0.67 young fledged/pair
1995	2	4	2.00 young fledged/pair
1996	1	0	Initial nest and renesting attempt both lost to predation by red fox.

Suitable plover nesting habitat at the southern end of the island was mapped and measured before and after the storms of 1991-1992. There was a 77% increase in the amount of nesting habitat available between years. Despite the increase in available habitat, there was no significant increase in numbers of nesting piping plovers, and their distribution throughout the available habitat remained similar to previous years, suggesting that birds were not available to colonize the newly created habitat (VDGIF 1992-1993). At the present time, the habitat at the southern end of Wallops is becoming less suitable due to encroaching vegetation (B. Cross, VDGIF, pers. comm. 1997; VDGIF 1995-1996).

The plover nesting and foraging area at the south end of the island is approximately 1,087 m from the proposed launch pad. Therefore, it is estimated that only the small portion (approximately 400 square meters) of existing plover habitat within the action area will be affected by launches at pad 0-B.

Effects of the Action - No information is available on the effects of rocket launches on foraging and nesting shorebirds. The most similar action for which Service has such information relates to fireworks displays (U.S. Fish and Wildlife Service 1997). Direct impacts to plovers from fireworks early in the breeding season may cause plovers to abandon their territories. Plovers will often abandon their nests and broods during fireworks displays, exposing eggs and chicks to weather and predators. If a flightless chick were to become permanently separated from its parents during the confusion, mortality

is almost certain. Abandonment of colonies as a result of fireworks has been documented in other colonial-nesting birds. For example, a fireworks display in New Jersey caused permanent abandonment of a least tern (*Sterna antillarum*) colony located more than 250 m away. In addition, temporary abandonment and displays of distress were documented in a least tern colony located greater than 0.75 miles from a fireworks event. The Service's guidance (U.S. Fish and Wildlife Service 1997) recommends that fireworks launch sites be located at least 0.75 miles from the nearest piping plover nesting and/or foraging area.

Direct impacts to the piping plover from the construction of the proposed rocket launch facility are not anticipated because of the distance (1,087 m) from launch pad to the nesting/foraging area. The piping plover may be adversely affected by the noise and light associated with rocket launches. NASA has estimated actual launch operations will last from 2 to 10 minutes. Because no data specific to this type of activity is available, it is difficult to anticipate how plovers will be affected. The Service anticipates that between March 1 and September 15 of any year, depending on the time of year, time of day, and proximity to the launch site, plovers will temporarily abandon the area during migration and/or the breeding season. While temporary abandonment of eggs or chicks does increase the chances of predation and exposure to the elements, actual mortality or reduced productivity is very unlikely. Similarly, a brief interruption in foraging will not result in significant impacts. The Service anticipates minimal impacts to the plover because of the short duration of the disturbance, the long distance between the disturbance and the area used by plovers, the limited number of launches during the nesting season, and the lack of other disturbances (e.g., recreation) to the plovers at this site.

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 the ESA. The Service is not aware of any cumulative effects.

CONCLUSION

After reviewing the current status of the piping plover throughout its range and in the action area, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that construction and use of launch pad 0-B, as proposed, is not likely to jeopardize the continued existence of the piping plover. No critical habitat has been designated for this species, therefore, none will be affected.

III. INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat

modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as 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 any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or 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.

AMOUNT OR EXTENT OF TAKE

The Service does not anticipate the proposed action will incidentally take any piping plovers due to the short duration of the disturbance, the distance between the launch pad and the plover nesting/foraging area, the limited number of launches that are likely to occur during the nesting season, and the lack of other disturbances (e.g., recreation).

IV. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans and other recovery activities, or to develop information to benefit the species. The Service recommends that following be implemented by NASA:

- o Whenever possible, conduct launches during daylight hours.
- o Provide more substantial fencing at the perimeter of piping plover use areas at the north and south ends of island to prevent human intrusion.
- o Post the fenced areas with “sensitive wildlife area” signs.
- o Close the piping plover use areas from March 1 through September 15 of every year to discourage human intrusion.
- o Piping plover nests should be protected with predator exclosures upon completion of the clutch.

In order for the Service to be kept informed of actions that minimize or avoid adverse effects or benefit listed species or their habitats, the Service requests notification of the implementation of any of these conservation recommendations by NASA.

V. REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the NASA 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 retained and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat 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, any operations causing such take must cease pending reinitiation.

If this opinion does not contain national security or confidential business information, the Service will provide copies to the appropriate state natural resource agencies ten business days after the date of this opinion.

The Service appreciates this opportunity to work with NASA and the Corps in fulfilling our mutual responsibilities under the ESA. Please contact Cindy Schulz of this office at (804) 693-6694, extension 127, if you require additional information.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

LITERATURE CITED

- U.S. Fish and Wildlife Service. 1996. Piping plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan. Hadley, MA. 258pp.
- U.S. Fish and Wildlife Service. 1997. Guidelines for managing fireworks in the vicinity of piping plovers and seabeach amaranth on the U.S. Atlantic Coast. Unpublished Report. Hadley, MA. 5pp.
- Virginia Department of Game and Inland Fisheries. 1992-1993. Annual report nongame and endangered wildlife program. Richmond, VA.
- Virginia Department of Game and Inland Fisheries. 1995-1996. Annual report nongame and endangered wildlife program. Richmond, VA.

APPENDIX A

NASA PIPING PLOVER MONITORING PLAN FOR ROCKET LAUNCHES FROM PAD 0-B WALLOPS ISLAND, VIRGINIA

1. Monitoring of piping plovers at the south end of Wallops Island will occur during the first three launches from launch pad 0-B that take place between March 1 and September 15. Depending on the results of the surveys, additional years of monitoring may be required at the discretion of the Service. Monitoring will be conducted daily for 7 consecutive days prior to a launch, during the launch (as dictated by human safety considerations), and for 7 consecutive days after the day of the launch. If it is not possible to monitor during the launch, monitoring will occur immediately before and after the launch. Monitoring should occur twice daily, early in the morning and late in the evening. Each monitoring event should be no longer than one hour and should only be as long as is required to collect the data listed below. A delay of the launch date may require additional monitoring. Each monitoring event will include:
 - o A detailed, to scale, map indicating the location of plovers and their nests in relation to the launch pad.
 - o Counts and locations of chicks.
 - o Habitat description of the areas utilized by the plover and in immediate vicinity of each nest.
 - o Dates for laying of each egg, if observed.
 - o Dates for loss of any chicks.
 - o Indices of predator abundance (presence or absence at the nest, track counts, etc.).
 - o Documentation of any sources of additional disturbance.
 - o Eggs counts per nest.
 - o Behavior of individual plovers (e.g., foraging, brooding, leaving area). This will include determining the frequency of incubation and causes and duration of any interruption to incubation or chick foraging.
 - o If pre-fledged young are present, their movements (foraging area and distance and direction moved from nest) should be plotted throughout the monitoring period.
 - o Peck rates should be measured for pre-fledged young during five-minute observation periods conducted during each monitoring event. The number of observation periods sufficient for analysis should be determined by the observer.
 - o On each data sheet, the following information should be recorded: date, start/stop time of observations, observer's name, weather conditions (e.g., raining, sunny), and temperature.
 - o The above information should also be recorded for Wilson's plovers to increase the sample size.

2. A summary report along with copies of any field notes will be submitted to the Service, at the address provided below, within 10 days of the last day of monitoring for each launch event. Monitoring will be conducted by an individual approved by the Service and the VDGIF. The

name and qualifications of the individual must be provided to the Service at least 90 days before the first day of monitoring for the first launch event to be monitored.

3. Within 30 days of providing the Service with the monitoring report for the third launch taking place between March 1 and September 15, NASA will contact the Service to arrange a meeting to discuss the necessity, duration, and intensity of additional monitoring.
4. All information to be provided to the Service should be sent to:

Virginia Field Office
U.S. Fish and Wildlife Service
P.O. Box 99
6669 Short Lane
Gloucester, VA 23061
Phone (804) 693-6694
Fax (804) 693-9032

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bcc: ARD-South, Region 5
Endangered Species Coordinator, Region 5
CBFO Reading File
Endangered Species Biologist, CBFO
Law Enforcement, Yorktown
(Attn: Dan Hurt)
Law Enforcement, Richmond
(Attn: Senior Resident Agent)
Anne Hecht, Endangered Species, Region 5
Manager, Chincoteague NWR

10 business days after the date of this letter, mail copies to:

VDGIF, Richmond
(Attn: Environmental Services)
VDGIF, Williamsburg
(Attn: Don Schwab)
DNH, Richmond
(Attn: Tom Smith)
Bob Cross, VDGIF
#5 Ames St.
Onancock, VA 23417