

**APPENDIX E: USFWS Letter of Concurrence**



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Washington, D.C. 20240



SEP 12 2014

In Reply Refer To:  
FWS/AES/DER/BCH/058309  
FWS 2014-I-0004

Ms. Holly Smith  
National Science Foundation  
Division of Ocean Sciences  
4201 Wilson Blvd., Suite 25  
Arlington, Virginia 22230

Subject: Informal Consultation on the High-Energy, 3-D Marine Geophysical Survey in the Atlantic Ocean off the Coast of Cape Hatteras and Associated Land-based Program

Dear Ms. Smith:

This letter is in response to your May 20, 2014, email requesting the U.S. Fish and Wildlife Service's (Service) concurrence that the proposed high-energy, 3-D marine geophysical survey in the Atlantic Ocean off the coast of Cape Hatteras and associated land-based program is not likely to adversely affect the endangered roseate tern (*Sterna dougallii*), Bermuda petrel (*Pterodroma cahow*), red-cockaded woodpecker (*Picoides borealis*), wood stork (*Mycteria americana*), Saint Francis' satyr butterfly (*Neonympha mitchellii francisci*), golden sedge (*Carex lutea*), pondberry (*Lindera melissifolia*), rough-leaved loosestrife (*Lysimachia asperulaefolia*), harperella (*Ptilimnium nodosum*), Michaux's sumac (*Rhus michauxii*), American chaffseed (*Schwalbea americana*), Cooley's meadowrue (*Thalictrum cooleyi*); the threatened piping plover (*Charadrius melodus*), and seabeach amaranth (*Amaranthus pumilus*); and the proposed northern long-eared bat (*Myotis septentrionalis*), pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 -1544), as amended (ESA). This consultation is based on the draft Environmental Assessment entitled a Marine Geophysical Survey by the R/V *Marcus G. Langseth* in the Atlantic Ocean off Cape Hatteras, September – October 2014.

Lamont-Doherty Earth Observatory (L-DEO), with funding from the U.S. National Science Foundation (NSF) plans to conduct high-energy, 3-D geophysical surveys along the mid-Atlantic Coast of the East North American Margin and mostly within the U.S. Exclusive Economic Zone and partly in International Waters (located between approximately 32 and 37°N and approximately 71.5 and 77°W). The seismic survey will be conducted from September through October, 2014, and will take place in water depths between 30 to 4,300 meters.

The goal of the proposed research is to collect and analyze data along the mid-Atlantic coast in order to investigate how the continental crust stretched and separated during the opening of the



Atlantic Ocean, and what the role of magmatism was during the continental breakup. The procedures to be used for the surveys would be similar to those used during previous seismic surveys by L-DEO and would use conventional seismic methodology. The surveys would involve one source vessel, the *R/V Langseth*. The *Langseth* would deploy an array of either 18 or 36 airguns as an energy source with a total discharge volume of approximately 3,300 to 6,600 cubic inches. The receiving system would consist of 8 kilometer hydrophone streamer or 94 ocean bottom seismometers (OBSs). The OBSs would be deployed and retrieved by a second vessel, the *R/V Endeavor*. As the airgun array is towed along the survey lines, the hydrophone streamer would receive the returning acoustic signals and transfer the data to the on-board processing system. The OBSs record the returning acoustic signals internally for later analysis.

A total of approximately 5,000 kilometers of 2-D survey lines, including turns, would be shot and the OBS lines would be shot a second time with the streamer for a total of approximately 6,350 kilometers. There would be additional seismic operations in the survey area associated with turns, airgun testing, and repeat coverage of any areas where initial data quality is sub-standard. In addition to the operations of the airgun array, a multibeam echosounder, a subbottom profiler, and an acoustic Doppler current profiler will be operated from the *Langseth* continuously throughout the survey. All planned geophysical data acquisition activities would be conducted by L-DEO with on-board assistance by the scientists who have proposed the study. The vessel would be self-contained and the crew would live aboard the vessel with some personnel transfer on or off the *Langseth* by a small vessel.

An associated land-based program would consist of passive and active components permitted by state and local agencies. Small, passive seismometers would be placed primarily alongside state roads in two, 200 kilometer transects, at or just under the soil surface, and at three coastal locations. No impact to the environment would be expected from this activity. The active source component would be limited to 14 small detonations along the transects in pre-disturbed areas with easy access, such as along the edges of agricultural fields and along logging roads, buried approximately 25 meters deep and sealed over the upper 15 meters. This component would be carried out by the University of Texas-El Paso, which would obtain all permits and licenses required for these activities. No activities would occur in any protected lands, preserves, or sanctuaries, and because the holes would be sealed, negligible impact to the environment would be expected from the detonations. ESA-listed species would be avoided, thus no impacts would be anticipated. The closest approach to the ocean would be more than 2 km, so no impact to water column would be expected from vibrations on land.

Once shots have been charged and seismographs deployed, shots would be detonated one at a time. This would be done by a licensed shooter who would ensure the shot site was clear of people and animals before shooting. The sound of the detonation would be comparable to distant thunder. Ground vibration would only be felt within a few hundred meters of the shot. Accidental and unauthorized detonation of shots would be prevented by use of electronic detonators, which must receive a coded signal at the time of detonation. If material were ejected from shot holes after detonation, it would be plugged again in accordance with state regulations. Effects of the terrestrial component of the project would be very limited because of the nature of the activities.

Although unlikely to be encountered, the listed roseate tern, Bermuda petrel, or piping plover could occur at or near the ocean-based project site.

The roseate tern breeds on islands along the northeast coast of the U.S from New York to Maine and north into Canada, and historically as far south as Virginia. During the breeding season, roseate terns forage over shallow coastal waters, especially in water depths less than 5 meters, sometimes near the colony and at other times at distances of over 30 kilometers away. They usually forage over shallow bays, tidal inlets and channels, tide rips, and sandbars. Because of its distribution during the breeding season, the roseate tern likely would not be encountered at the proposed survey site.

The Bermuda petrel is a rare bird with close to 100 nesting pairs. Currently, all known breeding pairs breed on islets in Castle Harbour, Bermuda. In the non-breeding season (mid-June to mid-October), it is thought that birds move north into the Atlantic and following the warm waters on the western edges of the Gulf Stream. There are confirmed sightings off North Carolina, thus, a small number of Bermuda petrels could be encountered over deep water at the eastern edge of the proposed survey area.

The piping plover breeds on coastal beaches from Newfoundland to North Carolina from March through August. Its marine nesting habitat consists of sandy beaches, sandflats, and barrier islands. Feeding areas include intertidal portions of ocean beaches, mudflats, sandflats, and shorelines of coastal ponds, lagoons, or salt marshes. Because its preferred habitat is strictly coastal, the piping plover likely would not be encountered at the proposed survey site.

In the rare event one of these species is in the vicinity of the survey area, there is the potential that the bird might be affected slightly by seismic sound from the proposed study. The impact would not be expected to be significant to the individual bird or their population because the majority of observed sound levels are below the water surface. Additionally, the proposed action includes precautionary measures of powering or shutting down the airguns if a listed bird is seen diving in the area.

Based upon the unlikely chance a bird of these species will be in the action area as well as the precautionary measures in place, we do not anticipate any adverse impacts to the listed roseate tern, Bermuda petrel, or piping plover.

Although unlikely to be encountered, any of the following listed or proposed animals or plants could occur at or near the land-based project sites: red-cockaded woodpecker, wood stork, Saint Francis' satyr butterfly, golden sedge, pondberry, rough-leaved loosestrife, harperella, Michaux's sumac, American chaffseed, Cooley's meadowrue, seabeach amaranth, and northern long-eared bat.

The red-cockaded woodpecker is endemic to the southeastern United States, where it inhabits fire-sustained open pine-forest, dominated in half of its range by longleaf pine elsewhere by shortleaf, slash, or loblolly pine. It could potentially be found around most of the nominal drill sites. It is a cooperative breeder (i.e., family groups typically consist of a breeding pair with or without one or two male helpers), and each group requires at least 80 hectares of habitat. Nests

are in cavities of living old-growth (100+ years) trees, and eggs are laid from late April to early June. Both adults and nestlings forage more in shortleaf and loblolly pine habitats than in longleaf pine forest. The red-cockaded woodpecker likely would not be encountered because its habitat is forest, and land-based operational activities would not occur there.

The wood stork could potentially be found in 2 of the 14 nominal drill sites, near the middle of the southern line. Historically, the core of the wood stork breeding population was located in the Everglades of southern Florida. Populations there diminished because of habitat deterioration, but the breeding range has now almost doubled in extent and shifted northward to wetland complexes along the Atlantic coast as far as southeastern North Carolina. Throughout its range, the wood stork is dependent upon wetlands for breeding and foraging. It has a unique feeding method and requires higher prey concentrations than other wading birds. Optimal water regimes involve periods of flooding, during which prey (fish) populations increase, alternating with dryer periods, during which receding water levels concentrate fish at higher densities coinciding with the stork's nesting season. In north and central Florida, Georgia, and South Carolina, storks lay eggs during March through late May, with fledging occurring in July and August. Nests are frequently located in the upper branches of large cypress trees or in mangroves on islands. The wood stork likely would not be encountered because its habitat is wetlands, and land-based operational activities would not occur there.

Saint Francis' satyr butterfly could potentially be found in 2 of the 14 nominal drill sites, the sites on the southern line that are farthest inshore. There is currently only one known population of Saint Francis' satyr butterfly, found in a range that is approximately 10 kilometers by 10 kilometers at Fort Bragg, North Carolina. The population consists of a number of small inactive (formerly occupied) and active sites (subpopulations), that range from 0.2 to 2.0 hectares in size; most active sites are found in artillery impact areas that are restricted in access. The distribution of Saint Francis' satyr butterfly at the local subpopulation level is most closely tied to grassy wetlands with numerous sedges that are created and maintained through a regular disturbance regime, especially by beavers or fire. The most influential disturbances are beaver impoundments, which create inundated regions highly favorable to sedge growth. Most subpopulations are found in abandoned beaver dams or along streams with active beaver complexes. Saint Francis' satyr butterfly cannot survive in sites that either are inundated by flooding or succeed to riparian forest. Fire may also be a type of disturbance of importance; fire resets succession, where grassy wetlands naturally succeed to shrub lands and then hardwood forest. The host plant for Saint Francis' satyr butterfly larvae is *Carex mitchelliana*, a sedge that grows in swampy woods and wet meadows. The butterfly's adult lifespan averages 3 to 4 days. Saint Francis' satyr butterfly likely would not be encountered because its habitat is wetlands, and land-based operational activities would not occur there.

Golden sedge could potentially be found in 2 of the 14 nominal drill sites, areas on the southern line that are closest to shore. It is a perennial member of the sedge family that is endemic to Onslow and Pender Counties, North Carolina. Eight populations are recognized made up of 17 distinct locations or element occurrences all occurring within a 26 kilometer by 8 kilometer area, extending southwest from the community of Maple Hill. Golden sedge generally occurs on fine sandy loam, loamy fine sands, and fine sands that are moist to saturated to periodically inundated. Critical habitat has been designated for the golden sedge; none of those areas are

around the nominal drill sites. Golden sedge likely would not be encountered because its habitat is wetlands, and land-based operational activities would not occur there.

Pondberry could potentially be found in 5 of the 14 nominal drill sites, all on the southern line. As of 1993, there were 36 populations of pondberry distributed in Arkansas, Georgia, Mississippi, Missouri, North Carolina, and South Carolina. There are two known populations in North Carolina, one in Cumberland County and one in Sampson County. Pondberry occurs in seasonally flooded wetlands, sandy sinks, pond margins, and swampy depressions. In the coastal sites of North and South Carolina, pondberry is associated with the margins of sinks, ponds, and depressions in the pinelands. Pondberry likely would not be encountered because its habitat is wetlands, and land-based operational activities would not occur there.

Rough-leaved loosestrife could potentially be found in 5 of the 14 nominal drill sites, all on the southern line. Rough-leaved loosestrife is a rare perennial herb, endemic to the coastal plain and sandhills of North Carolina and South Carolina. North Carolina populations are known from the following counties: Bladen, Brunswick, Carteret, Cumberland, Harnett, Hoke, New Hanover, Onslow, Pamlico, Pender, Richmond and Scotland. Most of the populations are small, both in extent of area covered and in number of stems. As of 1995, nearly all sites were on publicly owned land, with the majority on federally owned land. It is associated with sandy or peaty soils and moist open habitat that was more abundant prior to the development of the coastal region of the Carolinas. This species generally occurs in the ecotones or edges between longleaf pine uplands and pond pine pocosins (areas of dense shrub and vine growth usually on a wet, peaty, poorly drained soil) on moist to seasonally saturated sands and on shallow organic soils overlaying sand. Rough-leaf loosestrife has also been found on deep peat in the low shrub community of large Carolina bays (shallow, elliptical, poorly drained depressions of unknown origin). The grass-shrub ecotone, where rough-leaf loosestrife is found, is fire-maintained, as are the adjacent plant communities. Rough-leaved loosestrife could be encountered because several populations are known to occur near roadsides and power line rights of way where regular maintenance mimics fire and maintains vegetation so that herbaceous species are open to sunlight.

Harperella could potentially be found in 1 of the 14 nominal drill sites, the site on the southern line that is farthest inshore. Harperella is a perennial herb that typically occurs on rocky or gravel shoals and sandbars and along the margins of clear, swift-flowing stream sections. It is known from only two locations in North Carolina: one population in the Tar River in Granville County and another in the Deep River in Chatham County. Harperella likely would not be encountered because its habitat is riverine, and land-based operational activities would not occur in or near water.

Michaux's sumac could potentially be found in 3 of the 14 nominal drill sites, sites on the southern line that are farthest inshore. Michaux's sumac is endemic to the coastal plain and piedmont (the plateau region located between the coastal plain and the main Appalachian Mountains) from Virginia to Florida. Most populations are located in the North Carolina piedmont and sandhills. Currently, the plant occurs in the following counties: Cumberland, Davie, Durham, Franklin, Hoke, Moore, Nash, Richmond, Robeson, Scotland, and Wake. Michaux's sumac grows in sandy or rocky, open woods with basic soils, apparently surviving

best in areas where some form of disturbance has provided an open area. Several populations in North Carolina are on highway rights-of way, roadsides, or on the edges of artificially maintained clearings. Others are in areas with periodic fires and on sites undergoing natural succession, and one is in a natural opening on the rim of a Carolina bay. Michaux's sumac could be encountered because its habitat includes roadsides and the edges of artificially maintained clearings, where land-based operational activities would occur.

American chaffseed could potentially be found in 6 of the 14 nominal drill sites, sites on both northern and southern lines. American chaffseed occurs in New Jersey and from North Carolina to Florida. It is found in sandy, acidic, seasonally moist to dry soils, and is generally found in habitats described as open, moist pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. Chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables to maintain open to partly-open conditions. Most surviving populations are in areas that are subject to frequent fire, including plantations where burning is part of management for quail and other game, army base impact zones that burn regularly because of artillery shelling, forest management areas burned to maintain habitat for wildlife, and private lands burned to maintain open fields. American chaffseed could be encountered because its habitat includes private lands burned to maintain open fields, where land-based operational activities could occur.

Cooley's meadowrue could potentially be found in 2 of the 14 nominal drill sites, areas on the southern line that are closest to shore. Currently, Cooley's meadowrue is known from North Carolina, Georgia, and Florida. In North Carolina, populations are located in Brunswick, Columbus, Onslow, and Pender counties, including several sites protected by The Nature Conservancy and North Carolina Division of Parks and Recreation. It occurs in grass-sedge bogs and wet pine savannahs and savannah-like areas, and can also occur along fire plow lines, in roadside ditches, woodland clearings, and powerline rights-of-way, where some type of disturbance such as fire or mowing maintains an open habitat. Cooley's meadowrue could be encountered because its habitat includes roadsides, where land-based operational activities would occur.

Seabeach amaranth could potentially be found in 3 of the 14 nominal drill sites, areas on both lines that are closest to shore and include some coastline. It is native to the barrier island beaches of the Atlantic coast. An annual plant, to grow it appears to need extensive areas of barrier island beaches and inlets, functioning in a relatively natural and dynamic manner, allowing it to move around in the landscape, occupying suitable habitat as it becomes available. It often grows in the same areas selected for nesting by shorebirds such as plovers, terns, and skimmers. Seabeach amaranth likely would not be encountered because its habitat is barrier island beaches, and land-based operational activities would not occur there.

The northern long-eared bat is listed as proposed and could potentially be found in 1 of the 14 nominal drill sites, near the middle of the northern line. The range of the northern long-eared bat includes much of the eastern and north central United States, and all Canadian provinces. During winter, northern long-eared bats hibernate in caves and mines called hibernacula. During summer, they roost singly or in colonies underneath bark, in cavities, or in crevices of live or dead trees. Breeding begins in late summer or early fall, when males swarm near hibernacula.

After copulation, females store sperm during hibernation; in spring, they emerge from their hibernacula, ovulate, and the stored sperm fertilizes an egg. After fertilization, pregnant females migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies, with young, generally have 30 to 60 bats, although larger maternity colonies have been observed. Most females in a colony give birth from late May or early June to late July. The northern long-eared bat likely would not be encountered because its habitat is forest and hibernacula, and land-based operational activities would not occur there.

While there is a slight potential for the aforementioned listed or proposed species to be encountered during the land-based activities of the proposed action, the chances of such an encounter are very small. Additionally, the contractors will receive specific training on how to identify the listed species and should they be encountered, alternate drill sites will be selected. Based on this avoidance measure, coupled with the mitigation measures in place for the ocean-based activities, we concur that the activities covered under the NSF's proposed high-energy, 3-D marine geophysical survey and associated land-based activities, "may affect" but "are not likely to adversely affect" the aforementioned listed and proposed species. Coordination with National Marine Fisheries Service on listed species under their jurisdiction is still required.

We are pleased that NSF, L-DEO and its contractors are committed to applying proactive protective measures in order to minimize effects on listed species. We appreciate the collaboration your staff has provided. If you have any question please contact Dr. Collette Thogerson of my office at (703) 358-2103.

Sincerely,



Larry Bright  
Acting Chief, Division of Environmental Review  
Ecological Services