

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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Ms. Lauren H. O'Donnell
Chief, Gas Branch 2
Federal Energy Regulatory Commission
Washington, D. C. 20426
Attn: Ms. Medha Kochhar

Colonel David L. Hansen
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096
Attn: Mr. Thomas Leedom, Regulatory Branch

Re: Patriot Project, OEP/DEER/Gas
Branch 2, East Tennessee Natural Gas
Company, Docket No. CPO1-415-
000

Dear Ms. O'Donnell and Colonel Hansen:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the above referenced proposed East Tennessee Natural Gas Company's Patriot Project located in Tennessee, Virginia, and North Carolina and its effects on the small-anthered bittercress (*Cardamine micranthera*) and the James spinymussel (*Pleurobema collina*), both Federally listed endangered. This biological opinion is submitted in accordance with Section 7 of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). The Federal Energy Regulatory Commission's (FERC) December 20, 2002 request for formal consultation was received on December 20, 2002.

This biological opinion is based on information provided in FERC's December 2002 biological assessment, the September 2002 Final Environmental Impact Statement, telephone conversations, meetings, field investigations, and other sources of information. A complete administrative record of this consultation is on file in this office.

Consultation history

Significant events related to this consultation, including actions taken prior to formal consultation, are listed chronologically in Appendix A.

BIOLOGICAL OPINION

I. DESCRIPTION OF PROPOSED ACTION

East Tennessee Natural Gas Company (ETNG) is proposing to construct and operate a natural gas pipeline and associated aboveground facilities in Tennessee, Virginia, and North Carolina, collectively referred to as the Patriot Project. The Patriot Project is under the jurisdiction of the FERC under Section 7(c) of the Natural Gas Act as amended and Title 18 CFR, Parts 157 and 284. ETNG filed its application with FERC on July 26, 2001, in Docket No. CP01-415-000. The FERC issued a preliminary determination on non-environmental issues for the Patriot Project on March 27, 2002. Subsequently, FERC issued the Draft Environmental Impact Statement (EIS) for the Patriot Project on April 26, 2002, and the Final EIS on September 20, 2002 (PBS&J 2002b).

The Patriot Project consists of two major components, the Mainline Expansion and the Patriot Extension. The Mainline Expansion involves expanding ETNG's existing mainline in Tennessee and Virginia through construction of approximately 73.6 miles of new pipeline loops, ranging in size from 20 to 24 inches in diameter, and five new compressor stations. ETNG also will modify seven existing compressor stations, uprate approximately 71.3 miles of pipeline, and abandon and re-lay approximately 22.5 miles of pipeline. The Patriot Extension involves construction of approximately 93 miles of 24- and 7 miles of 16-inch diameter new pipeline, three new meter stations, and associated mainline valves and appurtenant facilities in Virginia and North Carolina. Figure 1 shows the general location of the Mainline Expansion and Patriot Extension facilities (PBS&J 2002b).

A third component, the TVA Project facilities, were incorporated into the Patriot Project with an amendment filed with FERC on June 26, 2002. The TVA Project facilities that were incorporated into the Patriot Project included 8.7 miles of new pipeline loops, 5.4 miles of pipeline uprate, and modifications at two existing compressor stations in Tennessee. The Commission certificated the TVA facilities on December 21, 2001, in Docket No. CP01-375-000 (PBS&J 2002b).

The Patriot Project will impact a total of 2,707.1 acres of land during construction along both the Mainline Expansion and the Patriot Extension. Of that total, 1,386.6 acres will be required for construction of the Mainline Expansion including 630.3 acres along the existing right-of-way, 3.8 acres of new right-of-way, 60.5 acres for compressor stations, and 692.0 acres that will be temporarily impacted during construction and allowed to recover to pre-construction conditions. Construction along the Patriot Extension will require a total of 1,320.5 acres including 603.7 acres of new right-of-way, 1.9 acres for new meter stations, and 714.9 acres that will be temporarily impacted during

construction and allowed to recover to preconstruction conditions (FERC 2002a). The Patriot Project will cross 367 surface waterbodies and 71 wetlands. A total of 12.6 acres of wetlands will be affected and 922 acres of forest habitat will be cleared, of which 404.6 acres will be permanently cleared (FERC 2002a).

Pipeline construction proceeds as a moving assembly line and typically proceeds from one end of the pipeline to the other in sequence. The following is the general sequence: right-of-way survey, clearing and grading, trenching, pipe stringing and bending, welding, lowering in, backfilling, hydrostatic testing, cleanup restoration and post-construction monitoring. To reduce impacts to the aquatic habitat, ETNG has proposed the use of dry crossings techniques or horizontal directional drill, where feasible, instead of wet crossing techniques at water body crossings (FERC 2002a). Horizontal directional drill crossings involve tunneling under the waterbody. Dry crossing methods isolate the excavation area from the streamflow by channeling the water around the construction zone (FERC 2002a). There are several types of dry crossing methods; flume, dam and pump, isolated culvert methods, sheetpiling methods, etc. Boring and thumping are alternative crossing methods that consist of installing a pipe underneath a stream, thus avoiding direct impacts to the streambed. Boring and thumping require excavation of an approximate 75-foot by 100-foot pit on both sides of the stream to the depth at which the pipeline will be installed (PBS&J 2002b).

The Norfolk District of the U.S. Army Corps of Engineers (Corps) in Virginia also anticipates issuing a Nationwide 12 permit under provisions of the Clean Water Act. The Corps' permit number for this project is 01-V2113. The project description for the Corps permit application is as follows:

“Installation of approximately 152 miles of 24" natural gas pipeline within 7 Virginia counties - known as the Patriot Mainline Expansion (60 miles) and Extension (92 miles) Project. All the work that will occur in Virginia includes the crossing of 255 waterways and 58 wetlands (additional skip areas, reroutes, access roads and associated pipe yards to be surveyed as they become available). Total length of the 255 streams to be crossed is 5,089 linear feet; with a total of 6 acres of wetlands to be impacted by the 58 crossings, but only 1.49 acres of forested wetlands will be permanently impacted. The permittee will compensate permanent wetland impacts by contribution to The Virginia Wetlands Restoration Trust Fund; compensate in-stream aquatic impacts through contribution to a Virginia Game and Inland Fisheries fund; and compensate riparian impacts with a combination of stream bank stabilization, floodplain restoration, and creation of a 50-foot wide riparian buffer along individual property right-of-ways and/or purchase of additional riparian areas - with the granting of protective covenants on all designated mitigation buffer areas outside the immediate right-of-way.”

In North Carolina, the Wilmington District of the Corps authorized a Nationwide 12 for the Patriot Project on January 14, 2002. Description of project is as follows:

“Duke Energy Gas Transmission . . . located between NC 87 east to south of the intersection of NC 770 . . . near Eden, in Rockingham County, North Carolina. Proposed gas pipeline project resulting in approximately 4.42 acres of temporary impacts to the jurisdictional waters of Martin Creek, Smith River, Cascade Creek, and Dry Creek. Vegetation will be permanently altered within a 75-foot corridor through 2.69 acres of wetland. However, wetland hydrology will be maintained within this 75-foot wide corridor.”

In Tennessee, the Nashville District of the Corps authorized a Nationwide 12 for the Patriot Project on October 28, 2002. Project description:

“Patriot Project - Proposed natural gas pipeline loops and uprates requiring numerous waterbody and wetland crossings in Tennessee.”

The FERC has been designated as the lead Federal action agency for this project.

A. Action Area

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 Service has determined that the action area for this project is the area of land directly within the footprint of the proposed activities encompassing approximately 2,707 acres of land plus those areas adjacent and downstream of the pipeline that will be indirectly affected by the project.

B. Conservation Measures

Small-anthered bittercress

Conservation measures were originally proposed by ETNG in the report entitled “Species Assessment, U.S. Fish and Wildlife Service, Small-anthered bittercress, Patrick and Henry Counties, Virginia, November 2002.” Those conservation measures were subsequently revised as a result of the site visit conducted on January 22 and 23, 2003. The following conservation measures were provided by the applicant to the Service on January 27, 2003.

General Habitat Recommendations – All habitat areas

1. If construction occurs prior to April, ETNG will conduct *Cardamine* rosette surveys within the 100 foot construction work area and up to 100 feet upstream and downstream of pipeline crossing (if landowner permission can be obtained) within previously identified habitat areas.

2. If construction occurs during or after April/May, ETNG will conduct formal presence/absence surveys within the 100 foot construction work area and up to 100 feet upstream and downstream of pipeline crossing (if landowner permission can be obtained) within previously identified habitat areas.
3. For areas not considered suitable habitat by photo interpretation (Horse Pasture Creek – HE-32 and HE-34, Tributary to Horse Pasture Creek – HE-34, and Tributary to North Mayo River (11) – HE-36), ETNG will conduct either rosette or formal surveys prior to construction.
4. If small-anthered bittercress (SAB) is found during rosette or presence/absence surveys, the applicant will contact US Fish and Wildlife Service (USFWS) immediately and construct utilizing conservation measures as detailed below.
5. For areas determined to be non-habitat by the habitat surveys, additional surveys are not required prior to construction.

Conservation Measures for Known Populations or Habitat Areas Impacted Prior to Conducting Rosette or Formal Presence/Absence Surveys.

1. Reduce the construction work area to 75 feet wide.
2. Minimize tree and shrub clearing within 10 feet of the upper stream bank outside the limits of the trench work area and the access lane/bridge.
3. Prior to clearing and throughout construction, post signs stating “Sensitive Resource Area” at least 50 feet from edge of upper stream banks.
4. All bore/thump pits should be a minimum 50 feet back from the upper creek banks. No in stream activities are permitted at these crossings.
5. The access lane at the Tributary to South Mayo River (3) should be a maximum of 20 feet wide centered on the pipeline and should extend a minimum of 50 feet back from the upper creek banks. If populations are found in the other habitat locations, implement the reduced access lane as site conditions permit.
6. Access bridges at habitat or known populations should be span bridges with no in stream disturbances.
7. Maintenance activities at bore/thump locations should be limited to the original 20 foot wide access lane. Mowing activities should be limited to 10 feet centered on the pipeline and tree cutting should be limited to 10 feet on each side of the pipeline centerline.

8. In all areas that cannot be crossed via a bore/thump or horizontal directional drill, maintain right-of-way per wetland and waterbody specifications in Erosion and Sedimentation Control Plan, Section 8.2.2 as approved by the Virginia Department of Conservation and Recreation and FERC.
9. If bore/thump or horizontal directional drill fails, revert to one of the other approved dry crossing methods, implement all conservation measures and contact USFWS prior to initiating new construction method.
10. At the Highway 58/Rich Creek horizontal directional drill location, ETNG will not mow the permanent easement from Animal Clinic Road to Highway 58. Signs should be posted at near each road in the permanent easement and should state "ETNG Pipeline, Do Not Mow or Cut, Rich Creek Conservation Area."
11. When crossing habitat streams with techniques other than bore/thump or horizontal directional drill, streams must be crossed within 24 to 48 hours from initiating the stream crossing to restoration.
12. For all habitat streams not crossed by a bore/thump or horizontal directional drill, implement top-soil segregation techniques of the upper 12 inches of soil/substrate located between the stream banks and the open water portion of the stream. Segregated soil should be kept separate and protected from other trench spoil.
13. All additional temporary workspace (ATWS) areas should be placed a minimum of 50 feet from the upper creek banks.
14. All trench spoil, not stored in ATWS should be stockpiled at minimum of 10 feet from upper creek bank.
15. Install all state approved erosion and sedimentation (E&S) control devices between stock piled material and stream. All practicable and approved E&S measures should be employed to minimize and prevent erosion and sedimentation into stream.
16. Dry crossing techniques may be employed at the streams as indicated below:
 - Rich Creek – horizontal directional drill
 - Tributary to South Mayo River (3) – bore/thump
 - Tributary to Matrimony Creek (1) – bore/thump if construction occurs prior to rosette or presence/absence surveys and/or if plants are observed.
 - All other habitat streams may be crossed utilizing one of the approved dry crossing techniques other than a bore/thump or horizontal directional drill.

James spinymussel

The following is an excerpt from ETNG's Final Patriot Project Stream Mitigation Plan. See Appendix B for additional details of the plan.

“Over the past year, preliminary identification of the federally *endangered* James spinymussel (*Pleurobema collina*) has been documented in the South Mayo River (SMR). The Patriot project crosses several tributaries of the SMR. There is an effort in Virginia to conduct a comprehensive survey of the Upper Dan Watershed for the James spinymussel. Pursuant to information provided by PBS&J and Richard Neves of Virginia Tech, which documented mussel locations in reference to the pipeline crossings of the South Mayo tributaries, impacts to James spinymussel are not anticipated and significant adverse impacts upon this species are not anticipated to result from project activities due to the distance from the newly documented mussel locations. However, since the James spinymussel has been documented in the SMR, preconstruction surveys should be conducted and any mussels removed to eliminate potential impacts.

In addition, based on information for James spinymussel in the North Mayo River (NMR) and additional correspondence with Richard Neves, James spinymussel is not anticipated to occur within the tributaries and crossing of the NMR and impacts are not anticipated to occur. To ensure impacts are avoided to James spinymussel should they occur in the tributaries of and the actual NMR, a qualified fishery biologist should evaluate the streams prior to construction and relocated any mussels observed.”

II. STATUS OF THE SPECIES RANGEWIDE

A. Species Description

Small-anthered bittercress

Small-anthered bittercress is an erect, perennial herb of the mustard family (*Brassicaceae*). It has fibrous roots with usually one (or rarely more) simple or branched stem(s) growing 2-4 decimeters tall. It does not develop proliferating branches from the upper nodes, generally branching from the base in large plants, or unbranched from smaller plants (Weakley 2002). Basal leaves have 1-3 pairs of lateral leaflets (Weakley 2002) and stem leaves are alternate and usually unlobed. Stem leaves are typically broadly cuneate, rounded, or truncate and never cordate-clasping. Leaf edges have shallow, rounded teeth. Flowering and fruiting occur in April and May. The flowers have leafy bracts, four white petals (the tips ascending or erect), six stamens, and small, round anthers. *Cardamine micranthera* closely resembles *C. rotundifolia*, but also has some similarities to *C. pennsylvanica* (Weakley 2002). The anthers are about 0.5 mm long (U.S. Fish and Wildlife Service 1991), and the petals are 3-5 mm long

(Weakley 2002) and 1.2 to 2 mm wide (U.S. Fish and Wildlife Service 1991). The fruit is a long pod, 0.8 to 1.2 centimeters long, and contains brown seeds (U.S. Fish and Wildlife Service 1991).

James spinymussel

The James spinymussel is a small, filter-feeding freshwater mussel of the Family *Unionidae*, with a maximum size of approximately 3 inches. The shell of the James spinymussel is subrhomboid in juveniles with an obliquely subtruncated posterior, widely-spaced concentric striations, a shiny, straw-colored periostracum, and with or without spines on each valve. With growth the shell becomes more ovate or even arcuate, develops a rounded posterior and a brownish-black periostracum, and in most cases loses any spines it may have had. In the adult, the posterior ridge is also broad and rounded, hinge teeth are medium-sized but strong and completely developed, and nacre is whitish and with or without pink or bluish suffusions (Clarke and Neves 1984).

B. Life History

Small-anthered bittercress

Cardamine micranthera can be found in seepages, wet rock crevices, streambanks, sand and gravel bars, and wet woods along streams (U.S. Fish and Wildlife Service 1991). The variety of habitats are usually shaded by trees and shrubs typical to alluvial forests of the mountains and piedmont in North Carolina and Virginia. When found on sand and gravel bars within the wetted channel, small-anthered bittercress often occurs alone or in combination with mosses and periphyton. The species does not compete well with other herbaceous plants that colonize sunny areas and some invasive exotics, like Japanese honeysuckle (*Lonicera japonica*) and Japanese stiltgrass (*Microstegium vimineum*), can obliterate suitable habitat. The known populations that are the largest and most consistent in plant numbers seem to be associated with forested sites that also have seeps or springs that are colonized by small-anthered bittercress. The seeds that shed from these plants colonize the active creek channel and replace other plants that get washed downstream (EcoLogic Associates 2002). Seedlings probably do not germinate until the fall and rosettes begin to appear in winter (T. Wieboldt, Virginia Tech, pers. comm., 2003). Vulnerable life stage is likely during seed germination and seedling development, which probably occurs from the beginning of October to the end of January (T. Wieboldt, Virginia Tech, pers. comm., 2003). Pollinators have not been determined for this species, however, ants have been observed on the flowers (U.S. Fish and Wildlife Service 1991).

James spinymussel

The James spinymussel is somewhat nonspecific about its habitat requirements. It has been found in a variety of substrates ranging from sandy and silt habitats to gravel and embedded rubble (Hove and Neves 1994). It feeds on plankton collected from water passed over its mucous-lined gills, thereby consuming large quantities of micro-organisms and inert organic material from the water column (Fuller

1977). It is considered to be a short-term summer brooder. This freshwater mussel is gravid from late May through early August and the majority of the developing larvae or glochidia are released in early June through late July (Hove and Neves 1994). Male mussels release sperm into the water column in the spring; the sperm is then taken in by females during siphoning. Fertilized eggs are retained in the gills, which serve as brood pouches for the developing glochidia. The glochidia eventually drop off the female's gills, enter the water column, and attach to an appropriate host fish. Glochidial release and gravidity periods are thought to be influenced by water temperature and stream discharge (Hove and Neves 1994). Known fish hosts include the bluehead chub (*Nocomis leptcephalus*), rosyside dace (*Clinostomus funduloides*), blacknose dace (*Rhinichthys atratulus*), mountain redbelly dace (*Phoxinus oreas*), rosefin shiner (*Lythrurus ardens*), satinfin shiner (*Cyprinella analostana*), and central stoneroller (*Camptostoma anomalum*) (Hove and Neves 1994). The age class structure at two populations ranged from 3 to 19 years, with a mean age of 8 years and a mean annual mortality rate of $15.6 \pm 1.4\%$ (Hove and Neves 1994).

C. Population Dynamics

Small-anthered bittercress

Very little is known about the population biology and ecology of the small-anthered bittercress. A recovery goal for this species is to determine population size and age-class distribution for all populations.

James spinymussel

Little is known about the population dynamics of this species. The average fecundity of *Pleurobema collina* is lower than most other freshwater mussels. Most freshwater mussels brood between 75,000 and 3,000,000 glochidia/female. Gravid *P. collina* brood approximately 13,400 glochidia/female (Hove and Neves 1994). This lower than average fecundity may influence population stability during disturbance events or changes within their environment.

D. Status and Distribution

Small-anthered bittercress

Due to its rarity and vulnerability to threats, the small-anthered bittercress was Federally listed as endangered on September 21, 1989 (FR Vol. 54, No. 182, Sept. 21, 1989). Potential threats for this species include impoundments, channelization, conversion of the habitat to agriculture or forestry, herbicides, and encroachment of exotic species. At the time of listing, only four populations were known (U.S. Fish and Wildlife Service 1989). It was first collected in 1939 and described by Rollins in 1940 (Rollins 1940). It was then known from only two sites. Several searches from 1960-1977 failed to find the plant and it was presumed extinct. The species was known historically from Forsyth

County, North Carolina - the single population was destroyed when the site was converted to cattle pasture in the early 1960s (U.S. Fish and Wildlife Service 1991). In 1985, it was rediscovered in Stokes County, North Carolina and, in 1990, it was found in Virginia. It is currently known from 14 sites in Virginia and from 18 sites in North Carolina. It is endemic to the Dan River drainage in north-central North Carolina and south-central Virginia (U.S. Fish and Wildlife Service 1991). It has been documented in Patrick County, Virginia and Stokes County, North Carolina. No critical habitat has been designated for this species.

James spinymussel

Due to its rarity and vulnerability to threats, the James spinymussel was listed as a Federally endangered species on July 22, 1988 (FR Vol. 53, No. 141, July 22, 1988). It was historically widespread in the James River drainage. A.H. Clarke surveyed 73 potential and/or historic locations for the species, but was able to find the James spinymussel at only six of these sites (Clarke and Neves 1984). Based on this extensive field sampling of potential and historic habitats, in addition to other more recent survey data including two new populations found in 2000 and 2002 in the South Mayo and Dan waterways, the species is now known to inhabit sites in 17 waterways in Albemarle, Alleghany, Amherst, Botetourt, Craig, Henry, and Patrick Counties in Virginia, Caswell, Rockingham, and Stokes Counties in North Carolina, and Monroe County in West Virginia (U.S. Fish and Wildlife Service 1990; R. J. Neves, Virginia Tech, pers. comm., 2002; D. Suiter, U.S. Fish and Wildlife Service, pers. comm., 2002; Beaty and Neves 1997; Stephenson 1997; Lipford 1991; Hove 1990). No critical habitat has been designated for this species.

Although it is probable that the decline of the James spinymussel began with municipal growth and industrialization of cities and towns in the James River watershed, much of the decline has occurred in the last 30 years. A 2000 survey documented a 23 percent decline in the South Fork Potts Creek population between 1995 and 2000 (Ensign and Neves 2000). The species remained widespread through the mid-1960s, but now appears to be extirpated from approximately 90 percent of its historic range, with survival documented only in a few creeks and small rivers in the upper James River and Roanoke drainages. This restricted distribution makes the species vulnerable to threats such as water quality perturbations, disease, and displacement by expanding populations of the exotic Asian clam (*Corbicula fluminea*) (U.S. Fish and Wildlife Service 1990).

Siltation generated by road and urban construction, agriculture, and forestry practices have contributed to water quality problems and the decline of the James spinymussel. Suspended sediment can clog the gills of filter feeding mussels and eventually suffocate them. Asian clams often reach high population densities in freshwater streams and have been shown to remove between 40 to 60 percent of the phytoplankton from one stretch of river (Cohen et al. 1984). Impoundment construction changes the habitat from lotic to lentic conditions, which many mussel species cannot survive, and often causes increased downstream siltation and decreasing flow rates. Due to changes in flows below impoundments, water temperatures may be changed and host fish communities may be eliminated

(Bates 1962). Water pollutants that impact mussel populations include such substances as fly ash and sulfuric acid (Cairns et al. 1971, Raleigh et al. 1978), acid mine drainage (Neel and Allen 1964), organic wastes (Schmidt 1982), insecticides (Salanki and Varanka 1978), and chlorinated effluent from sewage treatment plants (Goudreau 1988).

E. Analysis of the Species Likely to Be Affected

Small-anthered bittercress

The proposed action has the potential to adversely affect the small-anthered bittercress within the action area. The effects of the proposed action on the small-anthered bittercress will be considered further in the remaining sections of the this biological opinion.

James spinymussel

The proposed action has the potential to adversely affect the James spinymussel within the action area. The effects of the proposed action on the James spinymussel will be considered further in the remaining sections of the this biological opinion.

The Service provided comments on several other federally listed species for this project: gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), little-wing pearl mussel (*Pegias fabula*), tan riffleshell (*Epioblasma florentina walkeri*), smooth coneflower (*Echinacea laevigata*), small whorled pogonia (*Isotria medeoloides*), Eggert's sunflower (*Helianthus eggertii*), and large-flowered skullcap (*Scutellaria montana*). Based on survey results and/or adherence to the recommended species-specific conservation measures, the Service has determined that the proposed action is not likely to adversely affect these species and they will not be considered further in this consultation.

III. ENVIRONMENTAL BASELINE (in the action area)

A. Status of the Species Within the Action Area

Small-anthered bittercress

The Patriot Extension will cross three streams in Virginia where the small-anthered bittercress has been documented: Rich Creek, Spoon Creek and a Tributary to the South Mayo River. The Virginia Department of Conservation and Recreation, Division of Natural Heritage has identified conservation sites for the Rich Creek and Spoon Creek sites (Figures 2 and 3). The conservation site boundaries and associated protective buffers were determined according to site hydrology to protect the species from land disturbing activities. The Rich Creek site was estimated to have 25 plants in 1995 (Van Alstine and Killeffer 1999). The surveys that were conducted in 2002 at the Rich Creek site estimated 70 plants (PBS&J July 2002a). The Spoon Creek site contains two populations. The northern population site at Spoon Creek had approximately 200 plants in 1999 and the southern site at Spoon

Creek had 590 plants in 1999 (Van Alstine and Killeffer 1999). The southern site is not within the action area of the project and therefore will not be considered further. In 2002, a new occurrence for the small-anthered bittercress was documented on a tributary to the South Mayo River. This population had an estimated 150 plants (PBS&J 2002a). Since this is a new discovery, the Virginia Department of Conservation and Recreation, Division of Natural Heritage has not developed a conservation site for this location. Long term monitoring has not been conducted at these sites, therefore, it is difficult to analyze the stability of these populations.

Additional survey work will be conducted during the spring of 2003 to determine if other populations of small-anthered bittercress occur within the action area. A survey to assess potential habitat within the action area was conducted in October of 2002 and identified 16 streams. Eight additional sites could not be assessed for potential habitat due to lack of landowner access (PBS&J 2002b). No critical habitat has been designated for this species therefore, none will be affected.

James spinymussel

The James spinymussel was recently discovered in the Dan River drainage in North Carolina in 2000 and in Virginia in the South Mayo River in 2002. Based on this new discovery, the Service recommended that surveys be conducted within appropriate habitat in the Dan River drainage. ETNG conducted surveys where requested, except for 2 streams where access was prohibited. ETNG has agreed to survey these streams prior to construction. The James spinymussel has not been documented within the action area of the project.

B. Factors Affecting the Species Environment Within the Action Area

Residential and commercial development, timber harvesting and agricultural practices occur within the action area and may affect the streams within that area. In addition existing powerline right-of-ways occur at the Spoon Creek Conservation Area and the Tributary to South Mayo River. These right-of-ways are regularly maintained through mowing and/or herbicide application.

IV. EFFECTS OF THE ACTION

A. Factors to be Considered

Proximity of the action:

The distance of the pipeline right-of-way to the nearest known small-anthered bittercress plant is as follows for each site:

- Rich Creek Conservation Site - 100 feet (190 feet from the horizontal directional drill entry point)
- Tributary to the South Mayo River - 40 feet (32 feet from construction right-of-way to nearest streambank)
- Spoon Creek Conservation Site (northern location) - 400 feet

For the waterbody crossing sites determined to have potential habitat for the small-anthered bittercress and the no access areas, surveys will be conducted prior to construction to determine the distance to any plants that may occur at the site.

For the James spiny mussel, distance cannot be determined until surveys are conducted on Round Meadow Creek and Jumping Branch.

Distribution: The known locations of small-anthered bittercress in Rich Creek, Tributary to South Mayo River, Spoon Creek (northern location), the 16 potential habitat sites and the 8 no access sites occur within the action area. These crossings occur in Segments 3 and 4 of the Patriot Extension in Virginia.

Activities that may impact the James spiny mussel will primarily occur at the waterbody crossings of Round Meadow Creek and Jumping Branch in Segments 2 and 3 of the Patriot Extension in Virginia.

Timing: The construction schedule for the Patriot Extension is currently proposed to start April 1, 2003, and end in July 2003. The entire project construction schedule is scheduled to commence on March 1, 2003 and end around September 2003 in Virginia. For the entire project, Duke is anticipating a completion date by December 2003 (J. Mahmoud, PBS&J, pers. comm. 2003).

Nature of the effect: Any suitable instream habitat within the footprint of the trench construction will be affected by the project. It is unclear whether this habitat that is disturbed by the pipeline trench will remain suitable habitat after construction. Suitable habitat for the small-anthered bittercress and the James spiny mussel may be impacted permanently. The riparian habitat will be cleared within the construction work area, with a 10-foot-wide corridor continually maintained in a herbaceous state through mowing. Clearing riparian vegetation near small-anthered bittercress plants may alter the habitat by increasing competition by exotic species and by changing the light intensities. Clearing riparian vegetation where freshwater mussels occur will affect their microclimate by increasing the stream temperature. Sedimentation may affect the waterbody downstream of any crossing. Sedimentation events could bury plants or mussels.

Duration: ETNG has agreed to complete all stream crossings with small-anthered bittercress concerns within 24 to 48 hours. This time period is from initiation of the stream crossing to restoration. A 10-foot-wide corridor centered over the pipeline may be maintained in a herbaceous state to facilitate periodic corrosion and leak surveys. In addition, trees or shrubs greater than 15 feet in height and

within 15 feet of the pipeline may be cut and removed from the right-of-way. For dry crossings where endangered mussels occur, ETNG has agreed to cross within 24-72 hours from the time the construction begins in the stream.

Disturbance frequency: The construction is anticipated to be completed by December 2003 for the entire project. Waterbody crossings will be completed in less than 72 hours. Future maintenance of the permanent easement will include routine vegetation clearing no more frequently than once every three years. A 10-foot wide corridor centered on the pipeline, may be maintained annually in a herbaceous state by mowing.

Disturbance intensity and severity: The effects of the disturbance from the proposed project are expected to be locally intense at the Tributary to the South Mayo River. Rich Creek Site will be horizontally drilled, therefore we expect little disturbance at this site. The Spoon Creek population is 400 feet from the pipeline stream crossing, so we do not anticipate the effect to be intense or severe at this site. The effects of disturbance are expected to be locally intense at any stream crossing where James spiny mussel is documented.

B. Analyses for Effects of the Action

Small-anthered bittercress

Direct Effects - Construction activities at stream crossings are likely to increase the turbidity and sedimentation of the surface water, disturb the stream substrate and alter the riparian habitat. Construction activities include clearing, grading, removal of streamside vegetation, excavation and backfilling of the trench, and hydrostatic testing (FERC 2002a). Dry crossing methods would minimize impacts to the aquatic habitat, but likely result in increased turbidity and sedimentation since work would be conducted in and adjacent to the streambed. Horizontal directional drill or bore and thump crossings are not likely to directly impact the aquatic habitat since they involve tunneling under the waterbody. The Service does not anticipate any direct impacts to small-anthered bittercress plants. However, additional surveys are planned and this determination may change based on the results of those surveys. Suitable habitat for the small-anthered bittercress will be directly impacted within the footprint of the pipeline at any waterbody crossing. ETNG has agreed to horizontal directional drill the Rich Creek site and no easement clearing will occur in the riparian area of this site, therefore, the Service does not anticipate any direct effects to small-anthered bittercress plants at the Rich Creek Site. Surveys will be conducted prior to construction at the Tributary to South Mayo River, to determine if any plants occur within the construction work area or downstream. No plants were found within the construction work area at the Spoon Creek site, therefore direct effects are not anticipated at this site.

Interrelated and Interdependent Actions - Proposed interrelated/interdependent actions of this project are valve stations, tap sites, and access roads (PBS&J 2002b). The Service does not believe that any of these actions may affect the small-anthered bittercress.

Indirect Effects - Sedimentation, changes in light intensity from forest canopy removal, and encroachment of invasive species due to establishment of the right-of-way are indirect effects of this project. Any work in the streambed may increase the sedimentation thus potentially eliminating suitable habitat and possibly burying any plant occurring downstream of the crossing. No indirect effects are anticipated at the Rich Creek site since the site will be horizontally drilled and no vegetation will be cleared in the vicinity of the stream. The documented plants at the Tributary to South Mayo River are upstream of the pipeline crossing, therefore sedimentation is not likely to affect this population. Additional surveys will be conducted at this site since the pipeline was shifted downstream after surveys were conducted. ETNG has agreed to shift the construction work area to provide a minimum 32 foot buffer from the stream. If plants are documented downstream of the pipeline crossing, sedimentation is likely to affect these plants from instream work. Areas with steep slopes where vegetation will be cleared may introduce sediment into the stream if those slopes are not stabilized quickly. Plants within 50 -100 feet of the vegetation clearing are likely to be affected by the changes in light intensity from forest canopy removal. In addition, the right-of-way may encourage the encroachment of invasive species, thus increasing competition where plants occur.

James spinymussel

Direct Effects - Direct impacts to the James spinymussel associated with this project include the potential to kill and/or injure mussels during construction through use of heavy equipment and excavation within the streambed. Mussels may be killed or stressed due to siltation of the stream from construction-related activity. Heavy siltation can result in the impairment of feeding, spawning, and larval survival of this species. Heavy siltation can also result in reduced oxygen levels, which can adversely impact metabolic processes.

Interrelated and Interdependent Actions - An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. The Service is not aware of any such actions near Round Meadow Creek and Jumping Branch or other potential survey sites for the James spinymussel.

Indirect Effects - Indirect effects are defined as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). Indirect effects to adult and larval mussels will result from siltation during rain events after construction. Removal and disturbance of vegetation during pipeline construction will encourage erosion from the site thereby increasing turbidity.

V. CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, 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.

Residential and commercial development, and forestry and agricultural activities are likely to continue to occur within the action area. Maintenance of the existing powerline right-of-ways in the action area will continue to occur.

VI. CONCLUSION

After reviewing the status of the small-anthered bittercress and James spinymussel, 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 the Patriot Pipeline, as proposed, is not likely to jeopardize the continued existence of the small-anthered bittercress and the James spinymussel. No critical habitat has been designated for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

James spinymussel

Sections 9 of the ESA and Federal regulation pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service 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 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 an otherwise lawful activity. 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 to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the FERC and the Corps so that they become binding conditions of any grant or permit issued to ETNG, as appropriate,

for the exemption in action 7(o)(2) to apply. The FERC and the Corps have a continuing duty to regulate the activity covered by this incidental take statement. If FERC and the Corps (1) fail to assume and implement the terms and conditions or (2) fail to require ETNG to adhere to the terms and conditions of the incidental take statement through enforceable terms

that are added to the permit or grant document, the protective coverage of Section 7(o)(2) may lapse. To monitor the impact of incidental take, the FERC or applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

Small-anthered bittercress

Sections 7(b)(4) and 7(o)(2) of the ESA generally do not apply to listed plants species. However, limited protection of listed plants from take is provided to the extent that the ESA prohibits the removal and reduction to possession of Federally listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of state law or regulations or in the course of any violation of a state criminal trespass law. If this project is on private land and the landowner is not the project sponsor, in addition to landowner permission, a Virginia Endangered Species Permit for plants may be needed. To determine if such a permit is necessary or to apply for this permit, contact:

Mr. Keith Tignor
Virginia Department of Agriculture and Consumer Services
Office of Plant Protection
P.O. Box 1163
Richmond, VA 23209
(804) 786-3515

AMOUNT OR EXTENT OF TAKE

James spinymussel

The Service anticipates that incidental take of James spinymussels may occur during construction of the pipeline in the form of harm or death of an unknown but small number of individuals within the construction work area and adjacent stream habitat due to physical disturbance, siltation, and other water quality degradation. Incidental take of James spinymussels may be difficult to quantify and detect because any mussels killed during construction will be difficult to observe or locate due to their coloring and small body size. Quadrat sampling has shown that two-thirds to three-quarters of mussels are subsurface, and not visible (R. J. Neves, Virginia Tech, personal communication, 2002). However, the following level of take of this species can be anticipated by extent of the habitat affected within the action area. Round Meadow Creek (S2+21.07) is approximately 13.7 meters wide and Jumping Branch (S3+21.51) is approximately 3 meters wide. The Service anticipates harm or death of all mussels within the 30.48 meter wide construction work area at each stream crossing. These areas measure 417.5 square meters (13.7 m by 30.48 m) at the Round Meadow Creek crossing and 91 square meters (3 m by 30.48 m) at the Jumping Branch crossing. The Service further anticipates harm of mussels from siltation, which will result from the actions of any instream activity. Siltation will affect mussels in the area from 100 meters upstream to 400 meters downstream of the centerline of the

permanent easement (approximately 8,350 square meters for both the Round Meadow Creek and Jumping Branch crossings).

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the James spiny mussel.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the James spiny mussel:

- o Construction must be conducted during the time of year when impacts to the James spiny mussel reproductive cycle are minimized. Construction must be avoided during mid-May through July when James spiny mussels are reproducing.
- o Strict erosion and sedimentation controls must be implemented at those crossings where the James spiny mussel occurs.
- o Activity in the vicinity of known locations of the James spiny mussel must be minimized to avoid siltation and physical injury to the species.

TERMS AND CONDITIONS

To be exempt from the prohibitions of Section 9 of the ESA, the FERC and the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary and only apply to streams where James spiny mussel is documented. Monitoring is not required for this project because the anticipated take is minimal.

8. Surveys for the James spiny mussel will be conducted by a qualified surveyor in Round Meadow Creek (S2+21.07) and Jumping Branch (S3+21.51). The survey will not be conducted during the time period of May 15 through July 31 of any year.
2. If the James spiny mussel is documented within the survey area of the pipeline, the Service recommends that the ETNG explore shifting the pipeline or avoid instream impacts by using the bore/thump or horizontal directional drill techniques.
3. No pipeline construction in or within 200 feet of waterbodies or its upstream tributaries where James spiny mussel occurs during the time period of May 15 through July 31 of any year to

protect water quality during egg fertilization and glochidial release of the James spiny mussel. However, pipeline construction may proceed via a bore/thump/horizontal directional drill as long as the aboveground construction activities are located a minimum of 200 feet from the top bank of stream.

4. If a bore/thump/horizontal directional drill or the shifting of the pipeline is not possible, any James spiny mussel within the construction work area must be relocated (upstream if possible) to suitable habitat in the waterbody where it was found. Results of the survey and relocation must be submitted to the Service no later than 60 days following completion of relocation. Each relocated mussel shall be marked with a Hallprint tag and the relocation sites marked with a hand-held GPS receiver. The relocation will not be conducted during the time period of May 15 through July 31 of any year. Relocation of mussels must be done by a qualified person with any required collecting permits from the Virginia Department of Game and Inland Fisheries.
5. Implement the mitigative measures stated in The Final Stream Mitigation Plan in Appendix B.
6. No mechanized equipment will be allowed in those streams containing James spiny mussel.
7. Human traffic within the streams during construction will be minimized.
8. No hydrostatic test withdrawal or discharge will occur in any waterbody or its upstream tributaries where James spiny mussel is documented.
9. All construction equipment should be refueled at least 200 feet from all waterbodies where James spiny mussel occurs and at least 100 feet from the upstream tributaries of these waterbodies and protected with secondary containment. Storage of hazardous materials, fuel, lubricating oil, or other chemicals will be stored at least 200 feet from waterbodies where James spiny mussel occurs and 100 feet from the upstream tributaries of these waterbodies.
10. Care must be taken in handling any dead specimens of proposed or listed species that are found in the project area to preserve biological material in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if a take is reached or exceeded and/or to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, notify the Service at the address provided in Condition 11.

11. ETNG is required to notify the Service before initiation of construction and upon completion of the project at the address given below. All additional information to be sent to the Service should be sent to the following address:

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

The Service anticipates that a small number of individuals of the James spiny mussel occurring within the 8,350 square meters of stream habitat may be incidentally taken as a result of the proposed actions. It is difficult to quantify incidental take; however, the Service anticipates a reduction in the number of mussels. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, the amount or extent of incidental take is exceeded beyond the 8,350 square meter area, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures. FERC and the licensee must immediately provide an explanation of the causes of the take, and review with the Service the need for possible modification of the reasonable and prudent measures and the terms and conditions.

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, or to develop information. The Service recommends that the following conservation measures be implemented at any stream where small anthered bittercress or potential habitat occurs.

Surveys

9. If construction occurs prior to April of 2003, conduct *Cardamine* rosette surveys within 100 foot construction work area and up to 100 feet upstream and downstream of pipeline crossing (if landowner permission can be obtained) within previously identified potential habitat areas, no access areas, and at the Tributary to South Mayo River (3). Surveys should be performed by a qualified surveyor. Surveyor should verify that rosettes have emerged at a previously known location prior to conducting rosette surveys.

10. If construction occurs during or after April/May of 2003, conduct formal presence/absence surveys for *Cardamine micranthera* within the 100 foot construction work area and up to 100 feet upstream and downstream of pipeline crossing (if landowner permission can be obtained) within previously identified potential habitat areas, no access areas, and at the Tributary to South Mayo River (3). These surveys should be conducted by a qualified surveyor during the appropriate time of year (April 20-May 20). Surveys can be conducted outside the April 20-May 20 time period if the surveyor verifies that *Cardamine micranthera* can be identified at a previously known location prior to conducting surveys.
11. For areas not considered potential habitat by photo interpretation (Horse Pasture Creek – HE-32 and HE-34, Tributary to Horse Pasture Creek – HE-34, and Tributary to North Mayo River (11) – HE-36), conduct either rosette (prior to flowering) or formal surveys prior to construction.
12. For areas determined to be non-habitat by the habitat surveys, additional surveys are not required prior to construction.
13. Results of rosette or presence/absence surveys should be provided to the Service prior to construction.

Conservation Measures for Known Populations or Potential Habitat Areas of Small-anthered Bittercress

1. If a plant is found within the construction work area, the Service would like to work with ETNG to avoid impacts to plants. The Service recommends that the access lane, at a minimum, be shifted to avoid any impacts to plants and that ETNG explore the use of a bore/thump or horizontal directional drill.
2. Reduce the construction work area to 75 feet wide or less.
3. Minimize tree and shrub clearing within 10 feet of the top bank of stream outside the limits of the trench work area and the access lane/equipment bridge.
4. Prior to clearing and throughout construction, post signs stating “Sensitive Resource Area” at least 50 feet from the top bank of stream.
5. All bore/thump pits should be a minimum 50 feet back from the top bank of stream. No instream activities should be permitted at these crossings.
6. The access lane/equipment bridge at the Tributary to South Mayo River (3) should be a maximum of 20 feet wide centered on the pipeline and should extend a minimum of 50

feet back from the top bank of stream from milepost S3-4.938 to milepost S3-4.972. If populations are found in the other habitat locations, implement the reduced access lane as site conditions permit (Figure 4).

7. Access bridges at habitat or known populations should be span bridges with no instream disturbances.
8. Maintenance activities within the permanent 50-foot easement at bore/thump locations should be limited to the original 20-foot wide access lane within 50 feet of the top bank of stream. Mowing activities should be limited to 10 feet centered on the pipeline and tree cutting should be limited to 10 feet on each side of the pipeline centerline.
9. In all areas that cannot be crossed via a bore/thump or horizontal directional drill, maintain right-of-way per wetland and waterbody specifications in the Patriot Project Erosion and Sedimentation Control Plan as approved by the Virginia Department of Conservation and Recreation and FERC.
10. If bore/thump or horizontal directional drill fails, revert to one of the other approved dry crossing methods, implement all conservation measures and contact the Service prior to initiating new construction method.
11. At the Highway 58/Rich Creek horizontal directional drill location, ETNG will not clear or mow the permanent easement from Animal Clinic Road to Highway 58. Signs should be posted near each road in the permanent easement and should state "ETNG Pipeline, Do Not Mow or Cut, Rich Creek Conservation Area."
12. When crossing streams with techniques other than bore/thump or horizontal directional drill, streams should be crossed within 24 to 48 hours from initiating the stream crossing to restoration.
13. For all streams not crossed by a bore/thump or horizontal directional drill, implement top-soil segregation techniques of the upper 12 inches of soil/substrate located between the stream banks and the open water portion of the stream. Segregated soil should be kept separate and protected from other trench spoil.
14. All additional temporary workspace (ATWS) areas should be placed at a minimum of 50 feet from the top bank of stream.
15. All trench spoil, not stored in ATWS should be stockpiled at a minimum of 10 feet from top bank of stream.

16. Install all state approved erosion and sedimentation (E&S) control devices between stock-piled material and stream. All practicable and approved E&S measures should be employed to minimize and prevent erosion and sedimentation into stream.
17. Dry crossing techniques may be employed at the streams as indicated below:
 - Rich Creek – horizontal directional drill
 - Tributary to South Mayo River (3) – bore/thump
 - Tributary to Matrimony Creek (1) – bore/thump if construction occurs prior to rosette or presence/absence surveys and/or if plants are observed.
 - All other habitat streams may be crossed utilizing one of the approved dry crossing techniques other than a bore/thump or horizontal directional drill.
18. Withdrawal or discharge of hydrostatic test water should be prohibited at streams (and any upstream tributaries) containing potential habitat or known populations.
19. Trench water should be directed away from streams or wetlands and into a stabilized, upland area. This area should be at a distance and location that will minimize sedimentation from entering the stream or wetland.
20. All construction equipment should be refueled at least 100 feet from all waterbodies, if possible, and protected with secondary containment. Storage of hazardous materials, fuel, lubricating oil, or other chemicals should be stored at least 100 feet from all waterbodies.
21. Herbicides should not be used to maintain permanent right-of-way.
22. The Service previously recommended that ETNG avoid the Spoon Creek Conservation Site and those streams containing small-anthered bittercress. ETNG indicated that shifting the pipeline to completely avoid these sites was not a feasible option. We recommend that ETNG coordinate with the Service and the Department of Conservation and Recreation, Division of Natural Heritage to support the recovery of the small-anthered bittercress through funding a comprehensive Virginia inventory effort and a land protection and land management project for the species in Patrick County, Virginia.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the FERC's December 20, 2002 request for formal consultation for the Patriot Project. 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 (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded beyond the 8,350 square meter area; (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 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.

The Service appreciates this opportunity to work with the FERC and the Corps in fulfilling our mutual responsibilities under the ESA. If you have any questions, please contact Kim Marbain of this office at (804) 693-6694, extension 126.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

cc: Brian Moyer, VDGIF, Richmond, VA
Keith Tignor, VDACS, Richmond, VA

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Appendix A. Consultation History

- 01/23/01 The Service received a request from Duke Engineering & Services (DE&S) for information on Federally listed species within the project area of the Patriot Pipeline in Virginia.
- 04/23/01 The Service provided information to DE&S on Federally listed species and species of concern in the vicinity of the project and recommended that surveys be conducted for freshwater mussels and small-anthered bittercress.
- 08/02/01 The Service received the report entitled *East Tennessee Natural Gas Company Patriot Project, Virginia, Endangered and Threatened Species Report August 2001* from DE&S.
- 08/28/01 The Service participated in a meeting to discuss endangered and threatened species in Virginia with DE&S, Virginia Department of Conservation and Recreation-Division of Natural Heritage, and Virginia Department of Game and Inland Fisheries.
- 12/07/01 The Service received the report entitled *East Tennessee Natural Gas Company Patriot Project, Virginia, Endangered and Threatened, Freshwater Mussel Report December 2001* from DE&S.
- 12/07/01 The Service received the *Virginia Joint Permit Application for Activities in Water and Wetlands for the East Tennessee Natural Gas Company Patriot Project October 2001* from the U.S. Army Corps of Engineers, Norfolk District.
- 04/02/02 The Service received a preliminary *Patriot Project Draft Environmental Impact Statement, East Tennessee Natural Gas Company, Docket No. CP01-415-000* from FERC.
- 04/08/02 DE&S provided proposed survey areas for the small-anthered bittercress near the documented locations in Virginia and the proposed survey methods via email.
- 04/16/02 The Service responded via email that we concurred with the proposed survey methods but reminded DE&S that we had also recommended surveys for the small-anthered bittercress within appropriate habitat in the vicinity of the proposed pipeline in Virginia.
- 04/16/02 DE&S responded that they would review the alignment sheets and make a determination of any other potential habitat for small-anthered bittercress.

- 04/16/02 The Service provided comments to FERC on the preliminary *Patriot Project Draft Environmental Impact Statement, East Tennessee Natural Gas Company, Docket No. CP01-415-000*.
- 04/26/02 The Service received a similar copy via email from PBS&J of the proposed survey areas previously sent 04/08/02.
- 04/26/02 The Service received the requested résumés for the individuals conducting the small-anthered bittercress surveys.
- 04/29/02 The Service contacted PBS&J to approve two individuals to conduct the small-anthered bittercress surveys.
- 04/30/02 The Service received the *Patriot Project Draft Environmental Impact Statement, East Tennessee Natural Gas Company, Docket No. CP01-415-000* from FERC.
- 07/23/02 The Service received the report entitled *Small-anthered bittercress survey, Report for the proposed patriot project, segment 3, Patrick and Henry Counties, Virginia July 2002* from PBS&J.
- 08/21/02 The Service provided a letter to FERC summarizing our comments pursuant to the ESA for the Patriot Project.
- 09/23/02 The Service received the *Patriot Project Final Environmental Impact Statement, East Tennessee Natural Gas Company, Docket No. CP01-415-000* from FERC.
- 10/09/02 The Service participated in a meeting with PBS&J and the Virginia Department of Conservation and Recreation-Division of Natural Heritage to discuss endangered species issues in Virginia.
- 11/12/02 The Service received the report entitled *Species Assessment, U.S. Fish and Wildlife Service, Small-anthered bittercress, Patrick and Henry Counties, Virginia November 2002* from PBS&J.
- 11/12/02 The Service provided comments to FERC on the *Final Environmental Impact Statement, East Tennessee Natural Gas Company, Docket No. CP01-415-000*.
- 11/18/02 The Service provided comments to PBS&J regarding the need for additional surveys for the James spiny mussel in Virginia.
- 12/10/02 The Service met with FERC to discuss unresolved issues pursuant to the ESA.

- 12/13/02 The Service summarized, in a letter to FERC, the issues discussed at the 12/10/02 meeting with FERC and agreed that FERC should complete the Biological Assessment and initiate formal consultation with the Service regarding impacts on the small-anthered bittercress and the James spiny mussel.
- 12/20/02 The Service received the Biological Assessment and the initiation of formal consultation from FERC.
- 01/08/03 The Service provided a letter to FERC acknowledging receipt of the December 20, 2002 letter requesting initiation of formal section 7 consultation under the ESA.
- 01/22-23/03 The Service participated in a site visit with PBS&J and Duke Energy.
- 01/27/03 ETNG provided revised conservation measures.

Appendix B. Final Patriot Project Stream Mitigation Plan – Virginia
FERC Docket No. CP01-415-000 (Prepared by ETNG)

The proposed Patriot Project in Virginia crosses 281 streams (additional streams may be identified during the surveys of the right-of-way skip areas where landowner access has not been granted) in Washington, Wythe, Carroll, Floyd, Smyth, Patrick, and Henry Counties, Virginia. Of these streams, 133 are classified as cold-water fisheries and 148 are considered warm-water fisheries. Please refer to Table 1 for a list of the streams traversed by the Patriot Project including the stream order, stream classification, fisheries classification, and crossing methods. Also, refer to the enclosed stream classification map identifying the stream order, fishery type, watershed, and which warm-water streams are considered significant warm-water fisheries that may qualify for potential mitigation.

Pursuant to the Virginia Department of Game and Inland Fisheries (VDGIF) policies, the state of Virginia has implemented standard stream crossing restrictions for cold-water fisheries that extend from October 1 to March 31 for brown and brook trout, and from March 15 to May 15 for rainbow trout. The standard stream crossing restrictions for warm-water fisheries extend from April 15 to July 15. Due to the magnitude of the proposed Patriot Project and the nature of pipeline construction, East Tennessee Natural Gas Company (ETNG) is requesting an exemption from the VDGIF to cross the streams as they are approached, regardless of time of year. To avoid, minimize, and if necessary compensate for the potential impacts (i.e., fish takes and habitat degradation) to fisheries resources, ETNG is proposing the following mitigation plan to address impacts associated with the proposed project.

Avoidance:

- 1) **FISH** – ETNG will attempt to cross all designated cold-water streams outside the standard time of year restrictions (TOYR). Upon the review of recent maps that delineated warm-water stream watersheds and crossings, a warm-water TOYR is not warranted. If ETNG’s construction schedule cannot accommodate the restricted period, ETNG will minimize and compensate for any adverse impacts. ETNG will restrict the crossing time period for Bear Creek in Smyth County from April 1 to July 31 to avoid impacts to the Tennessee Dace. The state *endangered* Tennessee dace (*Phoxinus tennesseensis*) occupies pool areas; therefore, the VDGIF recommends seining and/or electro fishing to remove fish species from within the direct impact area. These efforts will prevent direct impacts upon the dace and other fish species. In addition, the VDGIF recommends that all fish be removed within the 100-foot construction right-of-way within the stream crossing (discussed at recent site visits) or direct impact area of all warm-water and cold-water stream crossings to avoid adverse impacts from fish kills. This 100-ft construction corridor is designated in the Erosion and Sediment Control Plan (E&SCP) as the area associated with flume and dam/pump stream crossing techniques. This direct impact area may vary according to the stream crossing technique.

MUSSELS – Mussel surveys were conducted in Walker Creek, Hungry Mother Creek, Sulphur Spring Creek, and Bear Creek to evaluate occurrences of the state *endangered*

Tennessee heelsplitter mussel (*Lasmigona holstonia*). The heelsplitter was not documented; however, high densities of associated species were observed which, may indicate that the heelsplitter may be present in the stream but not found during the survey. Therefore, the VDGIF recommends removal and relocation of all mussels in the streams referenced above from within the direct impact area of the stream crossing. ETNG will employ an approved fisheries specialist and ensure that the specialist has all appropriate permits required to move the mussels. If a federally listed threatened or endangered mussel is identified within the construction work area, ETNG will notify the USFWS of the location and either employ a different crossing technique or shift the pipeline to avoid the mussel. ETNG will not impact or relocate a federally listed mussel without consulting with the USFWS.

Mussel surveys were conducted in the Roanoke and Upper Dan watersheds and the results indicated that mussels were not abundant. Over the past year, preliminary identification of the federally *endangered* James spiny mussel (*Pleurobema collina*) has been documented in the South Mayo River (SMR). The Patriot project crosses several tributaries of the SMR. There is an effort in Virginia to conduct a comprehensive survey of the Upper Dan Watershed for the James spiny mussel. Pursuant to information provided by PBS&J and Richard Neves of Virginia Tech, which documented mussel locations in reference to the pipeline crossings of the South Mayo tributaries, impacts to James spiny mussel are not anticipated and significant adverse impacts upon this species are not anticipated to result from project activities due to the distance from the newly documented mussel locations. However, since the James spiny mussel has been documented in the SMR, preconstruction surveys should be conducted and any mussels removed to eliminate potential impacts.

In addition, based on information for James spiny mussel in the North Mayo River (NMR) and additional correspondence with Richard Neves, James spiny mussel is not anticipated to occur within the tributaries and crossing of the NMR and impacts are not anticipated to occur. To ensure impacts are avoided to James spiny mussel should they occur in the tributaries of and the actual NMR, a qualified fishery biologist should evaluate the streams prior to construction and relocated any mussels observed.

Minimization:

- 1) ETNG will cross all streams utilizing dry crossing methods. The U.S. Army Corp of Engineers – Norfolk District (USACE), VDGIF, Virginia Marine Resource Commission (VMRC), Virginia Department of Conservation and Recreation (VDNR) and Virginia Department of Environmental Quality (VADEQ) will be given at least one-week's notice of the crossing date, the anticipated crossing method, and the estimated flow rates of the streams. Correspondence will occur via e-mail. At the request of the VDGIF, ETNG will contact Bud LaRoche, Joe Williams, Bill Kittrell, George Palmer, Mike Pinder, and Tom Wilcox. ETNG will also contact the other Virginia state and federal agencies and any designee provided by the agencies to ETNG. Coordination with selected individuals is based upon the location of the crossing. ETNG encourages the agencies to participate in a site visit.

- 2) All streams with running water at the time of construction that are classified as native trout streams and in streams containing *endangered* or *threatened* fish and mussel species be crossed with one of the dry crossing methods within 24- to 72-hours from the time construction begins in the stream. Furthermore, all designated trout streams should be spanned by workbridges to facilitate fish movement during the spawning period. Support for the span bridges can be temporarily placed in the streams as long as adequate spacing is provided to allow fish movement (i.e. minimum of 24 inches between supports) and the supports are countersunk sufficiently to allow fish passage. All remaining stream crossings will be constructed utilizing one of the dry crossing methods and will be implemented within 24 to 48 hours with a maximum of 72 hours from the time the dam and pump begins, except at horizontal directional drill (HDD) locations.
- 3) ETNG will flume some of the smaller minor stream crossings that are not classified as native trout streams or streams that contain *endangered* or *threatened* fish and mussel species with running water while it is performing its mainline construction technique and will return at a later date (no more than 30 days) to lower-in the pipeline section. The 24-hour clock doesn't start until the flume is removed for lowering-in. While the flume is in place, prior to lowering in the pipe, ETNG will maintain normal flow in the streams. When ETNG lowers the pipe in place, ETNG will pump around the water until the pipe is installed and the stream is restored.
- 4) Equipment bridges (i.e., mats, railroad car, rock flume, etc.) will be installed during grading operations. Furthermore, all heavy equipment will cross the streams on equipment bridges and will cross all streams a maximum of one time off of the equipment bridge.
- 5) ETNG will implement its E&SCP (enclosed) to minimize erosion and sedimentation at the stream crossings. In addition, all spoil material from the trench located within the stream will be temporarily stock piled in uplands and contained to avoid in-stream sedimentation. Trench water will be discharged into sediment filter bags surrounded by hay bales. ETNG will attach any permit conditions, this mitigation plan, and any state-specific restrictions to the E&SCP as an attachment once all permits and approvals have been secured. In addition, all permits, clearances, and consultations will be part of the environmental clearance package for the portion of the project in Virginia. These documents will supersede the general E&SCP and will be provided to the construction contractors prior to construction.
- 6) ETNG will backfill the stream trench with native clean material, except in streams with unsuitable sandy, clay, and silty soils, wherein ETNG will supplement the trench with sufficient sized rock to stabilize the trench. ETNG will stabilize the stream banks and restore the stream crossing back to its pre-construction elevations and contours. ETNG will provide a four to six inch depression along the stream trench to allow for natural sedimentation on top of the trench. In streams with native rock cobble, ETNG will segregate the native clean rock for use while back-filling. ETNG will also replace large rocks back into the streams to reestablish the native stream fishery habitat off of the trench line. The VDGIF supports the use of large rock to

enhance fish habitat. During the stream restoration, the construction contractor will consult with the fishery biologist and ETNG engineer to determine the amount and location of the rock to prevent stream hydraulic impacts from eroding the stream bank.

- 7) ETNG will attempt to minimize the width of the right-of-way crossing to the minimum amount necessary to safely and efficiently cross the streams. Following construction, ETNG will stabilize the stream banks, allowing the stream-side vegetation, located between the ordinary high water mark and the upper stream bank, to reestablish and maintaining the stream vegetation only above the upper stream banks. Exceptions will include maintenance cutting of trees that reestablish along the stream banks. ETNG will limit maintenance tree clearing to a maximum of 30 ft within the permanent pipeline right-of-way and will make every reasonable attempt to minimize tree clearing immediately adjacent to the streams. If possible, ETNG will replant forested riparian areas up to 50 foot on each side of the stream outside the permanent right-of-way with native trees pursuant to landowner permission.
- 8) ETNG will provide a fisheries biologist to function as a biological monitor. The monitor will be selected and approved collectively by ETNG, United States Fish and Wildlife Service (USFWS), VDGIF, and the VADEQ. The fisheries biologist and ETNG will coordinate with Shelly Miller, DGIF, Aquatic Analyst, to develop collection protocols prior to construction or crossing of the streams. The monitor's primary responsibilities will include:
 - a) Evaluation of stream impacts during all phases of the construction process (i.e., direct kills from construction, downstream salutation, habitat alteration, etc.).
 - b) Removal of fish and mussels from the 100-ft construction area using seining and/or electro fishing. The biologist will be trained on mussel removal and relocation. The cofferdams may serve as blocknets during electro fishing. All fisheries relocated will be identified and cataloged.
 - c) Relocation of trout and warm-water fish species immediately prior to crossing the streams identified as cold-water or warm-water fisheries to a downstream location. The biologist will also assess adverse impacts upon trout nests at each cold-water crossing.
 - d) Provide weekly monitoring reports to all interested resource and regulatory agencies as directed (i.e. USACE, USFWS, VDGIF, and VADEQ) summarizing the stream crossings during that time period as well as the anticipated stream crossings for the following week. The report will include a list of fish and mussel species collected and relocated at each site.
 - e) The biologist will be funded by ETNG and will report directly to the VDGIF as well as ETNG's Chief Environmental Inspector.

- f) The fisheries biologist will be present for all stream crossings to remove or relocate any mussel and fishery resources.

Compensation:

- 1) ETNG will provide compensation to the VDGIF or to a fund identified by the VDGIF for instream construction during the TOYR in cold-water and designated warm-water streams and to mitigate any angling impacts. Compensation will include one payment of \$100,000 to be paid within 45 days following project completion.
- 2) ETNG will pay restitution for any fish killed according to the published fish valuation provided by the VADEQ and will coordinate any fish kills with the VADEQ if required. Payment of the restitution will occur within 45 days following project completion.

(KMarbain:1/6/03)

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