Biology

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AH33

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Appalachian Elktoe

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the Fish and Wildlife Service (Service), are designating critical habitat for the Appalachian elktoe (Alasmidonta raveneliana) under the Endangered Species Act of 1973, as amended (Act). The areas designated as critical habitat for the Appalachian elktoe total approximately 231.1 kilometers (144.3 miles) of various segments of rivers in North Carolina and one river in Tennessee.

Critical habitat identifies specific areas that are essential to the conservation of a listed species and that may require special management considerations or protection.

Section 7(a)(2) of the Act requires that each Federal agency shall, in consultation with us, ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat. Section 4 of the Act requires us to consider economic and other impacts of specifying any area as critical habitat.

We solicited data and comments from the public on all aspects of the proposal, including data on economic and other impacts of the designation.

DATES: This rule is effective on October 28, 2002.

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ADDRESSES: Comments and materials received, as well as supporting documentation used in preparation of this final rule, are available for public inspection, by appointment, during normal business hours at the Asheville Field Office, U.S. Fish and Wildlife Service, 160 Zillicoa Street, Asheville, NC 28801.

FOR FURTHER INFORMATION CONTACT: John Fridell, Fish and Wildlife Biologist, Asheville Field Office (see ADDRESSES) (telephone 828/258-

3939, extension 225; facsimile 828/258-5330).

SUPPLEMENTARY INFORMATION:

Background

The Appalachian elktoe (Alasmidonta raveneliana) is a freshwater mussel that has a thin, kidney-shaped shell, reaching up to about 10 centimeters (4 inches) (J.A. Fridell, Service, pers. observation 1999). Juveniles generally have a yellowish-brown periostracum (outer shell surface), while the periostracum of the adults is usually dark brown to greenish-black in color. Although rays are prominent on some shells, particularly in the posterior portion of the shell, many individuals have only obscure greenish rays. The shell nacre (inside shell surface) is shiny, often white to bluish-white, changing to a salmon, pinkish, or brownish color in the central and beak cavity portions of the shell; some specimens may be marked with irregular brownish blotches (adapted from Clarke 1981). Clarke (1981) provides a detailed description of the species' shell, with illustrations; Ortmann (1921) discussed soft parts.

Distribution, Habitat, and Life History

The Appalachian elktoe is known only from the mountain streams of western North Carolina and eastern Tennessee. Although the complete historical range of the Appalachian elktoe is unknown, available information suggests that the species once lived in the majority of the rivers and larger creeks of the upper Tennessee River system in North Carolina, with the possible exception of the Hiwassee and Watauga River systems (the species has not been recorded from either of these river systems). In Tennessee, the species is known only from its present range in the main stem of the Nolichucky River.

Currently, the Appalachian elktoe has a very fragmented, relict distribution. The species still survives in scattered pockets of suitable habitat in portions of the Little Tennessee River system, Pigeon River system, and the Little River in North Carolina and the Nolichucky River system in North Carolina and Tennessee. In the Little Tennessee River system in North Carolina, populations survive in the reach of the main stem of the Little Tennessee River, between the city of Franklin and Fontana Reservoir, in Swain and Macon Counties (Service 1994, 1996; McGrath 1999; Fridell, pers. observation, 2002), and in scattered reaches of the main stem of the Tuckasegee River in Jackson and Swain Counties, from below the town of Cullowhee downstream to Bryson City (M. Cantrell, Service, pers. comm. 1996; Fridell, pers. observation 1996, 1997; McGrath 1998; T. Savidge, North Carolina Department of Transportation (NCDOT), pers. comm. 2001). The species was recently discovered (in 2000) in the Cheoah River, below Santeetlah Lake, in Graham County (W. Pennington, Pennington and Associates, Inc., Knoxville, Tennessee, pers. comm. 2000). On August 7, 2002, biologists with the NCDOT, U.S. Forest Service, and the Service recorded eleven live individuals and four shells from the Cheoah River below Santeetlah Dam, during a survey of portions of the river (Fridell, pers. observation 2002).

In the Pigeon River system in North Carolina, a small population of the Appalachian elktoe occurs in small, scattered sites in the West Fork Pigeon River and in the main stem of the Pigeon River, above Canton, in Haywood County (Fridell, pers. observation 1999; McGrath 1999). The Little River (upper French Broad River system) population of the species, in Transylvania County, NC, is restricted to small, scattered pockets of suitable habitat downstream of Cascade Lake

(Fridell, pers. observation 2000; C. McGrath, North Carolina Wildlife Resources Commission (NCWRC), pers. comm. 2000).

In the Nolichucky River system, the Appalachian elktoe survives in a few scattered areas of suitable habitat in the Toe River, Yancey and Mitchell Counties, NC (Service 1994, 1996; McGrath 1996, 1999); Cane River, Yancey County, NC (Service 1994, 1996; McGrath 1997); and the main stem of the Nolichucky River, Yancey and Mitchell Counties, NC, extending downstream to the vicinity of Erwin in Unicoi County, TN (Service 1994, 1996; Fridell, pers. observation 1998; S. Ahlstedt, U.S. Geological Survey, pers. comm. 2002). Two individuals have been found recently in the North Toe River, Yancey and Mitchell Counties, NC, below the confluence of Crabtree Creek (McGrath 1999), and 15 live individuals, with no more than 2 to 3 at each site (Fridell, pers. observation 2000), and one shell (S. Fraley, Tennessee Valley Authority, Norris, TN, pers. comm. 1999) have been recorded from the South Toe River, Yancey County, NC. The majority of the surviving occurrences of the Appalachian elktoe appear to be small to extremely small and restricted to scattered pockets of suitable habitat.

Historically, the species has been recorded from Tulula Creek (Tennessee River drainage), the main stem of the French Broad River, and the Swannanoa River (French Broad River system) (Clarke 1981), but it has apparently been eliminated from these streams (Service 1994, 1996). There is also a historical record of the Appalachian elktoe from the North Fork Holston River in Tennessee (S.S. Haldeman collection); however, this record is believed to represent a mislabeled locality (Gordon 1991). If the historical record for the species in the North Fork Holston River was a good record, the species has apparently been eliminated from this river as well.

The Appalachian elktoe has been reported from relatively shallow, medium-sized creeks and rivers with cool, clean, well-oxygenated, moderate-to fast-flowing water. The species is most often found in riffles, runs, and shallow flowing pools with stable, relatively silt-free, coarse sand and gravel substrate associated with cobble, boulders, and/or bedrock (Gordon 1991; Service 1994 and 1996; J.M. Alderman, NCWRC, pers. comm. 2000; McGrath, pers. comm. 2000; Savidge, pers. comm. 2000; Fridell, pers. observation 1989 through 2002). Stability of the substrate appears to be critical to the Appalachian elktoe, and the species is seldom found in stream reaches with accumulations of silt or shifting sand, gravel, or cobble (Fridell, pers. observation 1989 through 2001). Individual specimens that have been encountered in these areas are believed to have been scoured out of upstream areas during periods of heavy rain and have not been found on subsequent surveys (McGrath, pers. comm. 1996; Fridell, pers. observation 1995, 1996, 1999).

Like other freshwater mussels, the Appalachian elktoe feeds by filtering food particles from the water column. The specific food habits of the species are unknown, but other freshwater mussels have been documented to feed on detritus (decaying organic matter), diatoms (various minute algae) and other algae and phytoplankton (microscopic floating aquatic plants), and zooplankton (microscopic floating aquatic animals). The reproductive cycle of the Appalachian elktoe is similar to that of other native freshwater

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mussels. Males release sperm into the water column, and the sperm are then taken in by the females through their siphons during feeding and respiration. The females retain the fertilized eggs in their gills until the larvae (glochidia) fully develop. The mussel glochidia are released into the water, and within a few days they must attach to the

appropriate species of fish, which they then parasitize for a short time while they develop into juvenile mussels. They then detach from their fish host and sink to the stream bottom where they continue to develop, provided they land in a suitable substrate with the correct water conditions.

Personnel with the Tennessee Technological University at Cookeville, TN, identified the banded sculpin (Cottus carolinae) as a host species for glochidia of the Appalachian elktoe (M. Gordon, Tennessee Technological University, pers. comm. 1993). The U.S. Environmental Protection Agency's (EPA) Science and Ecosystem Support Division's Aquatic Lab in Athens, Georgia, also documented the mottled sculpin (C. bairdi), a species more common within the majority of the range of the Appalachian elktoe than the banded sculpin, as a suitable host for the Appalachian elktoe (A. Keller, EPA, Athens, Georgia, pers. comm. 1999). The general habitat requirements of the mottled sculpin are very similar to those of the Appalachian elktoe and are described by several authors (Lee et al. 1980, Etnier and Starnes 1993, Rohde et al. 1994, Jenkins and Burkhead 1994) as riffles, runs, and flowing portions of pools with gravel and rocky substrata in cool, clean, well-oxygenated, moderate-to fast-gradient streams. The banded sculpin has similar habitat requirements but is considered to be more tolerant of warmer stream temperatures than the mottled sculpin (Lee et al. 1980, Etnier and Starnes 1993, Rohde et al. 1994, Jenkins and Burkhead 1994). Where the distribution of the two species overlap in streams supporting the Appalachian elktoe, the mottled sculpin is typically the most abundant, with the banded sculpin being generally more common in the downstream reaches of the streams, below the Appalachian elktoe occurrences. Of the two sculpin species, it is the mottled sculpin that most likely/most commonly serves as the host species for the Appalachian elktoe. Additional studies are needed to determine if any other native fish species may also serve as hosts for the glochidia of the Appalachian elktoe. The life span and many other aspects of the Appalachian elktoe's life history are currently unknown.

Reasons for Decline and Threats to Surviving Populations

Available information indicates that several factors have contributed to the decline and loss of populations of the Appalachian elktoe and threaten the remaining populations. These factors include pollutants in wastewater discharges (sewage treatment plants and industrial discharges); habitat loss and alteration associated with impoundments, channelization, and dredging operations and the run-off of silt, fertilizers, pesticides, and other pollutants from land disturbance activities implemented without adequate measures to control erosion and/or storm water (Service 1994, 1996).

Mussels are known to be sensitive to numerous pollutants, including, but not limited to, a wide variety of heavy metals, high concentrations of nutrients, ammonia, and chlorine--pollutants commonly found in many domestic and industrial effluents (Havlik and Marking 1987). In the early 1900s, Ortmann (1909) noted that the disappearance of unionids (mussels) is the first and most reliable indicator of stream pollution. Keller and Zam (1991) concluded that mussels are more sensitive to metals than commonly tested fish and aquatic insects. The life cycle of native mussels makes the reproductive stages especially vulnerable to pesticides and other pollutants (Ingram 1957, Stein 1971, Fuller 1974, Gardner et al. 1976). Effluent from sewage treatment facilities can be a significant source of pollution that can severely affect the diversity and abundance of aquatic mollusks. The toxicity of chlorinated sewage effluents to aquatic life is well documented (Brungs 1976, Tsai 1975, Bellanca and Bailey 1977, EPA 1985, Goudreau et al.

1988), and mussel glochidia (larvae) rank among the most sensitive invertebrates in their tolerance to toxicants present in sewage effluents (Goudreau et al. 1988). Goudreau et al. (1988) found that the recovery of mussel populations may not occur for up to 3.2 kilometers (km) (2 miles (mi)) below the discharge points of chlorinated sewage effluent.

Land-clearing and disturbance activities carried out without proper sedimentation and storm-water control pose a significant threat to the Appalachian elktoe and other freshwater mussels. Mussels are sedentary and are not able to move long distances to more suitable areas in response to heavy silt loads. Natural sedimentation resulting from seasonal storm events probably does not significantly affect mussels, but human activities often create excessively heavy silt loads that can have severe effects on mussels and other aquatic organisms. Siltation has been documented to adversely affect native freshwater mussels both directly and indirectly (Ellis 1936, Marking and Bills 1979, Kat 1982, Aldridge et al. 1987). Siltation degrades water and substrate quality, limiting the available habitat for freshwater mussels (and their fish hosts), thereby limiting their distribution and potential for expansion and maintenance of their populations; irritates and clogs the gills of filter-feeding mussels, resulting in reduced feeding and respiration; smothers mussels if sufficient accumulation occurs; and increases the potential exposure of the mussels to other pollutants. Ellis (1936) found that less than 2.5 centimeters (1 inch) of sediment deposition caused high mortality in most mussel species. Sediment accumulations that are less than lethal to adults may adversely affect or prevent the recruitment of juvenile mussels into the population. Also, sediment loading in rivers and streams during periods of high discharge is abrasive to mussel shells. Erosion of the outer shell allows acids to reach and corrode underlying layers that are composed primarily of calcium, which dissolves under acid conditions (Harman 1974).

The effects of impoundments on mussels are also well documented. For the most part, lakes do not occur naturally in western North Carolina and eastern Tennessee (most lakes in western North Carolina and eastern Tennessee are man-made), and the Appalachian elktoe, like the majority of our other native mussels, fish, and other aquatic species in these areas, is adapted to stream conditions (flowing, highly oxygenated water and coarse sand and gravel bottoms). Dams change the habitat from flowing to still water. Water depth increases, flow decreases, and silt accumulates on the bottom (Williams et al. 1992), altering the quality and stability of the remaining stream reaches by affecting water flow regimes, velocities, temperature, and chemistry. Dams that operate by releasing cold water from near the bottom of the reservoirs lower the water temperature downstream, changing downstream reaches from warm-or cool-water streams to cold-water streams and affecting their suitability for many of the native species historically inhabiting these stream reaches (Miller et al. 1984, Layzer et al. 1993). The effects of impoundments result in changes in fish communities (fish host species may be eliminated) (Brimm 1991), and in

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mussel communities (species requiring clean gravel and sand substrates are eliminated) (Bates 1962). In addition, dams result in the fragmentation and isolation of populations of species and act as effective barriers to the natural upstream and downstream expansion or recruitment of mussel and fish species.

The information available demonstrates that habitat deterioration resulting from sedimentation and pollution from numerous point and

nonpoint sources, when combined with the effects of other factors (including habitat destruction, alteration, and fragmentation resulting from impoundments, channelization projects, etc.), has played a significant role in the decline of the Appalachian elktoe. We believe this is particularly true of the extirpation of the Appalachian elktoe from the Swannanoa and French Broad Rivers and portions of the Pigeon, upper Little River, and upper Little Tennessee River systems. We believe these factors also have contributed to the extirpation of the species from parts of the upper Tuckasegee River, Cheoah River, and Tulula Creek, though the effects of impoundments are believed to have played an even more significant role in the loss of the species in the upper reaches of these streams.

The most immediate threats to the remaining populations of the Appalachian elktoe are associated with sedimentation and other pollutants (i.e., fertilizers, pesticides, heavy metals, oil, salts, organic wastes, etc.) from nonpoint sources. Much of the Nolichucky River in North Carolina contains heavy loads of sediment, primarily from past land disturbance activities within its watershed, and suitable habitat for the Appalachian elktoe appears to be very limited in this river system. The species has not been found in the Nolichucky River system in substrates with accumulations of silt and shifting sand; it is restricted to small, scattered pockets of stable, relatively clean, and gravelly substrates. The same is true of the other surviving populations of the species.

Previous Federal Actions

In the May 22, 1984, Animal Notice of Review published in the Federal Register (49 FR 21675) and again in the January 6, 1989, Animal Notice of Review (54 FR 579), we recognized the Appalachian elktoe as a species under review for potential addition to the Federal List of Endangered and Threatened Wildlife and Plants. In those notices, we designated the Appalachian elktoe as a category 2 candidate for Federal listing. We no longer maintain a list of category 2 candidate species. At that time, category 2 was defined as including species for which we had some information indicating that the taxa may be under threat, but not enough information was available to determine if they warranted Federal listing and the preparation of a proposed rule. Subsequently, surveys of historical and potential Appalachian elktoe habitat were conducted, revealing that the species had undergone a significant decline throughout its historical range and that the remaining occurrences were threatened by many of the same factors that are believed to have resulted in this decline. Accordingly, on June 10, 1992, we reclassified the Appalachian elktoe as a category 1 candidate. At that time, category 1 candidates were those species for which we had adequate information on biological vulnerability and threats to support proposals to list them as endangered or threatened species. On April 20, 1992, and again on August 21, 1992, we notified appropriate Federal, State, and local governmental agencies that we were gathering information on the Appalachian elktoe and that the species might be proposed for Federal listing. We received a total of six written comments in response to these two notices. The NCWRC (two written comments), the North Carolina Natural Heritage Program (two written comments), and an interested biologist expressed their support for the species' being proposed for protection under the Act. The Natural Resources Conservation Service stated that they did not have any additional information on this species.

On September 3, 1993, we published a proposed rule to list the Appalachian elktoe as an endangered species (58 FR 46940). The proposed rule provided information on the species' biology, status, and threats

to its continued existence and included our proposed determination that the designation of critical habitat was not prudent for the Appalachian elktoe. We solicited comments and suggestions concerning the proposed rule from the public, concerned governmental agencies, the scientific community, industry, and other interested parties. We requested comments from appropriate Federal and State agencies, county governments, scientific organizations, and interested parties by letters dated September 14, 1993, and January 27, 1994. We published a legal notice, which invited general public comment, in the following newspapers--Erwin Record, Erwin, TN, September 22, 1993; Mitchell News Journal, Spruce Pine, NC, September 22, 1993; Yancey Common Times Journal, Burnsville, NC, September 22, 1993; Smoky Mountain Times, Bryson City, NC, September 23, 1993; and Franklin Press, Inc., Franklin, NC, September 24, 1993.

We received four comments in response to the proposed rule, one supporting the listing and three requesting a public hearing. On January 21, 1994, we published a notice announcing the public hearing and the reopening of the comment period through February 21, 1994, to ensure that all interested parties had ample time to provide information on the proposed rule (59 FR 3326). On February 8, 1994, we held a public hearing at the Mitchell High School in Bakersville, NC. We received 20 verbal statements and written comments during the public hearing; 14 of them expressed opposition to the listing of the Appalachian elktoe, 5 expressed support for the listing, and 1 expressed an interest but offered neither support nor opposition. We received 40 additional written comments during the reopened comment period; 8 opposed the listing, 31 supported the listing, and 1 expressed neither opposition nor support.

Following our review of all the comments and information received throughout the listing process, we incorporated appropriate changes and on November 23, 1994, we published a final rule listing the Appalachian elktoe as endangered (59 FR 60324). That decision included our determination that the designation of critical habitat was not prudent for the Appalachian elktoe because, after a review of all the available information, we determined that such designation would not be beneficial to the species.

On June 30, 1999, the Southern Appalachian Biodiversity Project and the Foundation for Global Sustainability **filed** a lawsuit in the United States District Court for the District of Columbia against the Service, the Director of the Service, and the Secretary of the Interior challenging the Service's ``not prudent'' critical habitat determinations for four species in North Carolina--the Appalachian elktoe (Alasmidonta raveneliana), Carolina heelsplitter (Lasmigona decorata), spruce-fir moss spider (Microhexura montivaga), and rock gnome lichen (Gymnoderma lineare). On February 29, 2000, the U.S. Department of Justice entered into a settlement agreement with the plaintiffs in which we agreed to reexamine our prudency determination and, if appropriate, submit to the Federal Register, by February 1, 2001, a withdrawal of the

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existing not prudent determination for the Appalachian elktoe, together with a new proposed critical habitat determination. We agreed further that if we determined that the designation of critical habitat would be prudent for the Appalachian elktoe, we would send a final rule of this finding to the Federal Register by November 1, 2001.

On February 8, 2001, we published a prudency determination and a proposed designation of critical habitat for the Appalachian elktoe (66 FR 9540). This proposed rule included maps and a description of all

areas under consideration for designation as critical habitat for the species. By letter of February 9, 2001, we also notified appropriate Federal and State agencies, local governments, scientific organizations, individuals knowledgeable about the species, and other interested parties about the proposal and requested their comments. A legal notice that announced the availability of the proposed rule and invited public comment was published in the following newspapers--Erwin Record, Erwin, TN; Franklin Press, Inc., Franklin, NC; Graham Star, Robbinsville, NC; Mitchell News Journal, Spruce Pine, NC; Mountaineer, Waynesville, NC; Smoky Mountain Times, Bryson City, NC; Transylvania Times, Brevard, NC; and Yancey Common Times Journal, Burnsville, NC. At the request of the Transylvania County (NC) Board of Commissioners, we attended a Board of Commissioners public meeting on March 26, 2001, in Brevard, NC, where we gave a presentation on the proposed designation of critical habitat for the Appalachian elktoe and responded to questions concerning the proposal from the commissioners and the public in attendance.

In the proposed rule and associated notifications, all interested parties were requested to submit factual reports or information by April 9, 2001, that might contribute to our determination and the development of a final rule. In response to the proposed rule, we received 49 written comments, including two requests for public hearings.

On August 29, 2001, we entered into an agreement (referred to as the ``mini-global'' agreement) with the plaintiffs from the June 30, 1999, lawsuit that allowed us to reallocate funding to complete listing decisions on 14 species, proceed with proposed listing decisions on 8 species, take action on 4 listing petitions, and extend the deadline on 8 critical habitat designations, including the final determination concerning the designation of critical habitat for the Appalachian elktoe. Pursuant to this agreement, our deadline for submitting the final determination concerning the designation of critical habitat for the Appalachian elktoe to the Federal Register was extended to July 6, 2002. However, because we were unable to spend fiscal year 2001 funding on the required draft economic analysis of the potential effects of the designation of critical habitat for the Appalachian elktoe and approval for spending fiscal year 2002 appropriated funds for listing was not received until mid-November 2001, the development of the draft economic analysis was delayed. We then **filed** a motion in the District Court pursuant to our settlement agreement, requesting an extension to complete the final designation. On April 15, 2002, the District Court granted us an extension until September 20, 2002, to finalize the critical habitat designation for the Appalachian elktoe.

On May 16, 2002, we published a notice in the Federal Register (67 FR 34893) announcing the availability of a draft economic analysis for the proposed designation of critical habitat for the Appalachian elktoe; announcing the purpose, time, and location of public hearings requested during the initial comment period on the proposed rule; and announcing the reopening of the formal comment period on the proposed rule from May 16, 2002, to July 1, 2002. We notified appropriate agencies, governmental officials, institutions, and other interested parties, by letters dated May 6, 2002, of the reopening of the comment period, availability of the draft economic analysis, and the public hearings. In addition, we published legal notices in the newspapers listed above announcing the reopening of the comment period, the public hearings, and the availability of the draft economic analysis and inviting public participation and comments.

In response to the requests for public hearings, we held two hearings, the first on June 4, 2002, in Erwin, TN, and the second on June 6, 2002, in Bryson City, NC. Twenty-three individuals presented

oral comments at the two hearings (three of these individuals provided comments at both hearings), and we received 28 written comments during the reopened comment period. In addition, at the request of the Yancey County (NC) Manager, we attended a public meeting of the Yancey County Board of Commissioners on June 11, 2002, where we gave a presentation about the proposed designation of critical habitat for the Appalachian elktoe and an overview of past and potential future activities within the general area, with Federal involvement, that have required or are likely to require consultation under section 7 of the Act.

Summary of Comments and Recommendations

We received 26 oral comments at the two public hearings and a total of 78 written comments during the two comment periods-49 during the initial comment period and 29 during the reopened comment period. Of the responses/comments received, 71 supported the designation of critical habitat for the Appalachian elktoe, 25 expressed opposition to the designation, and 8 expressed neither support nor opposition but requested or provided additional information. Comments were received from The Eastern Band of Cherokee Indians, 1 congressional representative from Georgia, 1 Federal agency, 1 State agency, 3 elected county officials, 9 private organizations or businesses, and 62 private individuals. Several of the respondents provided comments during the initial comment period on the proposed rule and additional comments on the draft economic analysis and/or proposed rule during the reopened comment period. Some respondents provided both oral comments (during one or both of the public hearings) and written comments.

We also contacted, by phone and letters dated February 26, 2001, four experts in the field of malacology (native freshwater mussel biology and ecology) and requested that they serve as peer reviewers of the proposal to designate critical habitat for the Appalachian elktoe. However, none of the four submitted comments on the proposal.

We reviewed all comments received for substantive issues and any new information regarding the Appalachian elktoe. Similar comments were grouped into issues relating specifically to the proposed critical habitat determination and the draft economic analysis with regard to the proposed determination. These issues and our response to each are presented below.

Issue 1: One respondent pointed out that while the proposed rule states that the available information suggests that the Appalachian elktoe once lived in the majority of the rivers and larger creeks of the upper Tennessee River system in North Carolina, the species has not been recorded in the Watauga or Hiwassee Rivers.

Response: The respondent is correct, and we have mentioned these two river systems in this rule as possible exceptions to the historical range of the Appalachian elktoe.

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Issue 2: One respondent recommended that, because of the critical role of fish hosts in the mussel's life cycle, the final rule should include a discussion about the habitat and ecological requirements of the mottled sculpin. The same respondent suggested that other more motile fish species may serve as hosts for the glochidia of the Appalachian elktoe and may have some effect on which areas should be considered critical habitat.

Response: We agree with the respondent's first recommendation and have included a brief discussion of the habitat requirements of the mottled sculpin and banded sculpin in the ``Background'' section of this rule. However, while we also agree that it is possible that other

fish species may also serve as hosts for the glochidia of the Appalachian elktoe, additional research is needed to determine this. The two studies that have been conducted (see the ``Background'' section above) have identified only the two sculpin species--the mottled sculpin and the banded sculpin--as suitable hosts for the Appalachian elktoe. The areas we are designating as critical habitat constitute our best assessment of the areas needed for the conservation of the Appalachian elktoe based on the best scientific information currently available to us. These areas contain the habitat elements essential to the life cycle needs of the Appalachian elktoe, as they are currently known, including habitat for the species' fish hosts, as they are known. To the extent feasible, we will continue, with the assistance of other Federal, State, and private researchers, to conduct research on the life cycle needs of the species. Should new information become available indicating that other areas are essential to the conservation of the Appalachian elktoe, we may revise the designated critical habitat accordingly in a subsequent rule.

Issue 3: Two respondents recommended that the final rule would be more informative if it described the specific impacts in the streams and stream reaches where the Appalachian elktoe is believed to have been adversely affected or has been extirpated. Another respondent requested information about what has caused the decline in Appalachian elktoe populations and why, if water quality has improved in the Nolichucky River system, the Appalachian elktoe populations have declined.

Response: We have included some additional information in the ``Background'' section of this rule (see ``Reasons for Decline and Threats to Surviving Populations'' section) concerning the factors that are believed to have contributed to the decline of the species throughout its range and that threaten the surviving occurrences.

The available information demonstrates that the decline of the Appalachian elktoe throughout its range can be attributed to several factors, including siltation resulting from past logging, mining, agricultural, and construction activities; the run-off and discharge of organic and inorganic pollutants from industrial, municipal, agricultural, and other point and nonpoint sources; habitat alterations associated with impoundments, channelization, and dredging; and other natural and human-related factors that adversely modify the aquatic environment. It is true that there have been significant improvements in both water and substrate (stream bottom) quality in portions of the Nolichucky River system and other river systems supporting the species as a result of the implementation of Federal and State regulations for controlling sediment and other pollutants and an increased awareness and/or interest in, and voluntary implementation of, conservation measures. Many of the industries, landowners, builders, etc., in the watersheds of these rivers are to be commended for implementing measures for controlling the run-off of sediment and other pollutants into the rivers and their tributaries. The status of the Appalachian elktoe population in the Nolichucky River system appears to be in the process of recovering as a result of these improvements, and the species appears to be in the process of recolonizing portions of these rivers. However, the population in the Nolichucky River system is still very small and scattered. Despite intensive surveys by biologists with the Service, NCWRC, NCDOT, and Tennessee Valley Authority, no more than one to three specimens of the Appalachian elktoe have been found at most of the sites where it presently occurs in the Toe, Cane, North Toe, and South Toe Rivers. Also, while there have been improvements, activities are still occurring within the Nolichucky River watershed that continue to adversely affect the quality of portions of these rivers, and other activities are proposed that have the potential to

adversely affect them.

Issue 4: One respondent requested more specific information on the habitat requirements of the species and another respondent stated that the Service lacks the fundamental scientific qualifications necessary to determine Appalachian elktoe habitat requirements and to specify ``critical habitat'' for the species. Specifically, the latter respondent stated that there is little or no available quantifiable data on the species' habitat requirements, such as ``stream order, hydrology, water depth, water velocity, substrate preferences, and water temperature and chemistry.'' This respondent stated the Service's determination of critical habitat appears to rely solely on observations of general habitat conditions in streams where the Appalachian elktoe has been found.

Response: The Act requires us to base our critical habitat designations on the best scientific information available. While there is still much that we do not know or understand about the habitat requirements of the Appalachian elktoe (in particular, the species' microhabitat requirements), the primary constituent elements, as they are identified in the rule, are based on descriptions of the species' habitat provided by biologists with the Service, NCWRC, NCDOT, and Tennessee Technological University who have been involved in conducting surveys and monitoring populations of the species; they represent the best information on the habitat requirements of the species currently available to us. They are not observations of the general habitat conditions within the streams where the Appalachian elktoe occurs; rather, they represent a description of the habitat conditions present at the sites within these streams where the Appalachian elktoe occurs as compared to the other sites and/or reaches of these streams where the species is not found. While we will continue (with the assistance of other Federal, State, and private researchers) to conduct studies of the species and its habitat requirements, we do not believe it is likely that more specific information on the species' habitat requirements would result in a change to the stream reaches designated as critical habitat for the Appalachian elktoe. The continued presence of the Appalachian elktoe in these streams indicates the presence of the habitat requirements for the species, though we may currently understand these requirements only in relatively general terms. Rather, more specific information would allow us to better assess potential effects to the species and its habitat and to better identify and implement recovery and management activities for the species within these stream reaches. However, if new information becomes available indicating that other areas are essential to the conservation of the Appalachian elktoe, we may revise the designated critical habitat accordingly through a subsequent rulemaking. Similarly, if new information indicates any of the

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areas we have designated should not be included in the critical habitat designation because they no longer meet the definition of critical habitat and do not provide the habitat elements essential to the life-cycle needs of the species, we may, through a subsequent rulemaking, revise the critical habitat designation to omit these areas.

Issue 5: One respondent stated that the Act defines critical habitat as ``(i) the specific areas within the geographical area occupied by the species, at the time it is listed * * * and (ii) specific areas outside the geographical area occupied by the species at the time it is listed * * *'' The respondent further stated that the Service has insufficient information to make a finding that the Appalachian elktoe in fact occupied Unit 3, the Cheoah River below

Santeetlah Dam in Graham County, NC, at the time it was listed.

Response: While it is true that we were unaware of the Appalachian elktoe's occurrence in the Cheoah River when the species was listed on November 23, 1994 (FR 59 60324), the subsequent discovery of the species in the Cheoah River (Pennington, pers. comm. 2000) and the fact that the species is documented to have historically occurred in Tulula Creek (Clarke 1981), a tributary to the upper Cheoah River, indicates that the occurrence of the Appalachian elktoe in the Cheoah River is a natural occurrence of the species that existed both historically and at the time of listing.

Issue 6: One respondent stated that the conditions in the Nolichucky River system seem to vary considerably from the primary constituent element items 2 (geomorphically stable stream channels and banks) and 4 (sand, gravel, cobble, boulder, and bedrock substrates with no more than low amounts of fine sediment) in the list of primary constituent elements in the proposed rule and that conditions in the Cheoah River may not agree with items 1 (permanent flowing, cool, clean water), 3 (pool, riffle, and run sequences within the channel), and 6 (periodic natural flooding).

Response: Stream conditions throughout the Nolichucky River system do vary and where all of the constituent elements do not exist, the Appalachian elktoe is rarely found, though there have been rare instances in both the Toe (Nolichucky River system) and Little Tennessee Rivers that single individual specimens of the elktoe have been observed in unstable, sifting sand substrates. However, these individuals were not found during subsequent surveys and were believed to be individuals that had been displaced and deposited by storm flows (McGrath, pers. comm. 1996; Fridell, pers. observation 1995, 1996, 1999). Within the areas we are designating as critical habitat, the sites that support the majority, and healthiest, of the occurrences of the species provide all of the primary constituent elements, though at some sites (especially those sites and stream reaches supporting the lowest numbers of individuals) one or more of the constituent elements, though present, appear to be limited or of marginal quality and may require additional management and enhancement for full recovery of the species. At the sites in the streams within the Nolichucky River system, as well as elsewhere in the stream reaches that we are designating as critical habitat, the Appalachian elktoe is found consistently, with the few exceptions mentioned above, in stable substrates (most often comprised of sand and gravel interspersed in areas of cobble, boulders, or exposed bedrock) along reaches with overall stable, well-vegetated stream banks.

Concerning the questions raised about the conditions in the Cheoah River, the habitat conditions within the reach of the river that is being designated as critical habitat have been characterized as riffle, run, and pool habitat in varying sequences, with interspersed ledge/ step habitat in some reaches (Normandeau Associates Inc. 2001). Flow within the designated reach of the Cheoah River is maintained by leakage--2 cubic feet per second (cfs)--from Santeetlah Dam (Normandeau Associates Inc. 1999) and by flows from numerous tributary streams, including Cochran, Rock, Yellow, Deep, Barker, and Bear Creeks and several unnamed tributaries. Data from the U.S. Geological Survey (USGS) gage (0351706800) located on the river near Bear Pen Gap, approximately 1.7 miles upstream the river's confluence with the Little Tennessee River, show that the subject reach of the Cheoah River has maintained a continuous flow during the period of record (October 1999 through October 2001), with the lowest recorded daily flow of 8.8 cfs and the maximum recorded flow of 1,280 cfs (lowest daily mean flow of 9.1 cfs; maximum daily mean flow of 612 cfs; mean annual flow of 55.8 cfs) (USGS 2002). Bank-full flow/discharge (bank-full stage is the

point or elevation on the bank where flooding begins and corresponds to the flow at which channel maintenance is most effective) on the subject reach of the Cheoah River is estimated at 838 cfs, and from October 1999 through July 15, 2002 (USGS 2002), discharges gaged on the Cheoah River have reached or exceeded that volume of stream flow on at least 6 days. Accordingly, while it is true that the construction and operation of the Santeetlah Dam on the Cheoah River have had a significant effect on both the high and low flows in the Cheoah River downstream of the dam, we believe the reach of the Cheoah River that we are designating as critical habitat for the Appalachian elktoe does provide the primary constituent elements, including items 1, 3, and 6 (see ``Primary Constituent Elements'' section below); however, one or more of the constituent elements, though currently present, may be limited or of marginal quality and may require enhancement for full recovery of the species.

Issue 7: We received several comments requesting that additional streams and/or stream reaches be included in the critical habitat designation for the Appalachian elktoe. Specifically, we received requests to include in the critical habitat designation the main stem of the Nolichucky River in Washington and Greene Counties, TN, and the main stem and tributaries of the French Broad River, Swannanoa River, Tulula Creek, and the remainder of the Pigeon River in North Carolina. Four of these respondents stated that the designation of critical habitat should connect populations.

Response: Connecting the surviving populations of the Appalachian elktoe is not feasible because all of the surviving populations are separated from one another by major impoundments. All of the additional areas that we have been requested to include in the critical habitat designation for the Appalachian elktoe are, based on the most recent survey data, currently unoccupied by the species and do not appear to provide suitable habitat for the elktoe. In accordance with the definition of critical habitat (see ``Critical Habitat'' section below), we can only designate unoccupied habitat of the species if, based on the best available information, it is determined that such areas are essential to the conservation of the species.

The recovery plan for the Appalachian elktoe (Service 1996) states that the species will be considered for delisting (recovered) when a total of six distinct, viable populations of the species exist within the species' historical range (with at least one each in the Little Tennessee, French Broad, and Nolichucky River systems) that meet the criteria outlined in the plan. There are currently six known surviving populations of the Appalachian elktoe--the Nolichucky River system

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population, Little River population, West Fork Pigeon River/Pigeon River population, Tuckasegee River population, Little Tennessee River population, and the Cheoah River population. The areas that we are designating as critical habitat for the Appalachian elktoe are distributed in different portions of the species' known historical range (three populations in the Little Tennessee River system, two in the French Broad River system, and one in the Nolichucky River system) and contain the habitat elements essential to the life cycle needs of the species as they are currently known. We consider the six areas that we are designating as critical habitat as the most likely sites for focusing conservation efforts for maintaining and recovering the Appalachian elktoe in accordance with the goals outlined in our recovery plan for the species and based on the best scientific information currently available to us concerning the species' known historical range and habitat requirements.

Other than the stream reaches that we are designating as critical habitat, we are not aware of any other streams or stream reaches that provide suitable habitat for the Appalachian elktoe. However, to the extent feasible, we will continue, with the assistance of other Federal, State, and private agencies or organizations, to conduct surveys and research on the species and to evaluate habitat throughout its historical range. Should additional information become available that indicates other areas within the Appalachian elktoe's historical range provide suitable habitat and are essential to the conservation of the species, we may revise the critical habitat designation accordingly. Similarly, if new information indicates any of the areas we have designated should not be included in the critical habitat designation because they no longer meet the definition of critical habitat, we may revise this final critical habitat designation. If, consistent with available funding and program priorities, we elect to revise the designation, we will do so through a subsequent rulemaking.

Issue 8. Several of the comments we received expressed concern about the potential effect the proposed designation of critical habitat could have on the mining industry in Yancey and Mitchell Counties, NC.

Response: For the reasons described below, we do not believe that our designation of critical habitat for the Appalachian elktoe will result in any additional effects on mining activities beyond what already is required. Designated critical habitat receives regulatory protection only under section 7(a)(2) of the Act, which requires that Federal agencies shall, in consultation with the Service, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any species listed as endangered or threatened or result in the destruction or adverse modification of critical habitat. Aside from the protection that may be provided under section 7, the Act does not provide other forms of protection to areas designated as critical habitat. Thus, the section 7 requirement does not apply to mining operations for quartz, feldspar, mica, and other minerals carried out on private or other non-Federal land unless a Federal action is involved.

Currently, there are no coal mining operations carried out in Yancey and Mitchell Counties, NC. If subsurface coal mining was proposed, the Office of Surface Mining (OSM) would consult with us under section 7. If surface mining of coal was proposed, the OSM would be guided by a section 7 biological opinion (BO) we issued to them in 1996 for a consultation addressing surface coal mining and reclamation operations under State and Federal regulatory programs adopted pursuant to the Surface Mining Control and Reclamation Act of 1977, as amended, and its implementing regulations. In situations where the potential effects of a proposed new action are consistent with the evaluation and requirements of the prior consultation and BO, no additional consultation by OSM is needed.

We are not aware of any past or current applications by any of the mining companies in Yancey and Mitchell Counties to conduct mining operations in waters or wetlands that may be subject to permits issued by the U.S. Army Corps of Engineers (COE) pursuant to section 404 of the Clean Water Act. If mining in waters or wetlands were proposed, the COE would be required to consult with us if an action by them triggered the section 7(a)(2) requirement of the Act.

Direct discharge into creeks and rivers associated with the processing of minerals requires a National Pollution Discharge Elimination System (NPDES) permit, pursuant to section 402 of the Clean Water Act. Although NPDES permits are issued by the State of North Carolina, the EPA has oversight authority of the State's permitting program. Under the provisions of an interagency Memorandum of Agreement (MOA) adopted by the Service, the EPA, and the National Marine

Fisheries Service in 2001, the EPA agreed to consult with us on their decision to delegate to the States the authority to issue Clean Water Act permits. Once a State has been delegated this authority, the State's issuance of such permits is not considered to be a Federal action subject to section 7 consultation. The EPA has approved the State of North Carolina NPDES permit program, and consequently has not found it necessary to consult under section 7 regarding NPDES permits issued by the State of North Carolina for mining discharges. The MOA also provides that if the Service or EPA have concerns that an NPDES permit is likely to have a more than minor detrimental effect on a Federally listed species or critical habitat, a series of steps will be followed to resolve the situation with the State.

Furthermore, regardless of whether critical habitat has been designated, Federal agencies are required by section 7 of the Act to evaluate the direct and indirect effects of their actions and ensure that their actions are not likely to ``jeopardize the continued existence'' of a listed species. Because the Appalachian elktoe is already listed as an endangered species, a Federal agency already is required to consult with us if it determines that a proposed activity within its regulatory authority is likely to adversely affect the Appalachian elktoe, and to insure that the activity will not jeopardize the continued existence of the species. Under the regulations for section 7 consultations (50 CFR 402.02), ``jeopardize the continued existence'' is defined as any activity that would reasonably be expected, directly or indirectly, to appreciably reduce the likelihood of survival and recovery of a listed species in the wild. ``Destruction or adverse modification of critical habitat'' is defined as a direct or indirect alteration that appreciably diminishes the value of critical habitat for the survival and recovery of a listed species. Common to the definitions of ``jeopardy'' and ``destruction or adverse modification of critical habitat'' is the likelihood that both the ``survival and recovery'' of the species are appreciably reduced by the proposed action. Because of this common threshold, the restricted range of the Appalachian elktoe, and the fact that all of the areas that we are designating as critical habitat support populations of the species, any action that is likely to destroy or adversely modify critical habitat would also likely result in jeopardy to this species and, therefore, would already be prohibited by the Act through the jeopardy standard regardless of whether the area is designated as critical habitat.

In summary, for the reasons explained above, we do not believe that our

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designation of critical habitat for the Appalachian elktoe will have any regulatory effect on mining activities that have no Federal involvement, and we do not believe the designation of critical habitat will have any additional regulatory effect on mining activities that require Federal permits beyond what already is required as a result of the listing of the species.

Issue 9. Three respondents stated that the designation of critical habitat ``would, and will put a stop to all agriculture in the area; this could include the family garden.'' The same respondents also stated that the designation of critical habitat would adversely affect apple growers and Christmas tree farmers.

Response: As stated above, the regulatory requirements associated with critical habitat do not apply to any agricultural activities, including apple orchards, Christmas tree farms, or other tree farming, row crop farming, livestock farming, or any other activity carried out

on private land that does not require and/or involve a Federal permit or Federal funding. Generally, the only Federal regulations associated with agricultural activities with the potential to trigger the section 7 consultation requirements of the Act involve the use of pesticides and herbicides. The EPA consults with us on the registration of certain pesticides and herbicides that have been identified by the EPA to have the potential to harm listed species. In such cases, the potential effects to listed species and their habitat are addressed through warnings and restrictions placed on the label of the subject pesticides and herbicides (i.e., restrictions on application rates, application methods, frequency of application, disposal of containers, etc.). Further, as explained in our response to Issue 8, above, section 7 consultations on the registration of pesticides or herbicides, or on any other Federal activity with the potential to adversely affect the Appalachian elktoe or any federally listed species, is required regardless of whether critical habitat has been designated. For these reasons, we do not believe our designation of critical habitat for the Appalachian elktoe will result in any additional effects on agriculture beyond existing requirements related to the listing of the species.

Issue 10: Several respondents stated that the designation of critical habitat will infringe on private property rights, and one respondent stated that the designation will jeopardize the private property rights of a landowner even when that landowner is not in any way contributing to the endangerment of an endangered species.

Response: As explained in the response to Issues 8 and 9, the only regulatory consequence of the designation of critical habitat is the requirement under section 7 of the Act for Federal agencies to insure, in consultation with us, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. With regard to critical habitat, this requirement has no regulatory impact on a private landowner who takes action on his or her land that does not involve Federal funding or authorization. Because the Appalachian elktoe already is listed as endangered, Federal agencies already are required to consult with us on any of their actions that are likely to adversely affect the species and to insure that their actions do not jeopardize the species' continued existence, regardless of whether critical habitat has been designated. Therefore, we do not believe the designation of critical habitat for the Appalachian elktoe will result in any significant additional regulatory burden on landowners or affect the use of their property.

Issue 11: Several respondents stated that they agreed with the Service's original determination, made when the species was listed, that the designation of critical habitat was not prudent for the Appalachian elktoe. One of these respondents expressed concern that the designation of critical habitat and the associated publication of maps of critical habitat could increase the threat of collecting of the Appalachian elktoe and that it would be far safer for the Appalachian elktoe if critical habitat were not designated for the species.

Response: Section 4(a)(3)(A) of the Act requires that, to the maximum extent prudent and determinable, we designate critical habitat at the time a species is determined to be endangered or threatened. The regulations state that the designation of critical habitat is not prudent when one or both of the following situations exist: (1) The species is threatened by taking or other human activity and the identification of critical habitat can be expected to increase the degree of such threat to the species or (2) such designation of critical habitat would not be beneficial to the species (see ``Critical Habitat'' section below).

When we listed the Appalachian elktoe as endangered on November 23, 1994 (59 FR 60324), we concurrently determined that the designation of

critical habitat was not prudent because such a designation would not be beneficial to the species. In addition, we expressed our concern that the rarity and uniqueness of the Appalachian elktoe could generate interest in the species and that the publicity associated with the designation of critical habitat, together with the publication of maps and descriptions of critical habitat, could increase the vulnerability of the species to collection, vandalism, or other disturbance. Although we did not base our ``not prudent'' determination on an increased threat to the Appalachian elktoe, we did consider the potential increased threat to the species from critical habitat designation in making our determination that the designation of critical habitat was not prudent for the Appalachian elktoe because it would not benefit the species.

In the last few years, court decisions have overturned our determinations regarding a variety of species, concluding that the designation of critical habitat would not be prudent (e.g., Natural Resources Defense Council v. U.S. Department of the Interior, 113 F. 3d 1121 [9th Cir. 1997]; Conservation Council for Hawaii v. Babbitt, 2 F. Supp. 2d 1280 [D. Hawaii 1998]).

In Conservation Council of Hawaii v. Babbitt, 2 F. Supp. 2d 1280, 1284 (D. Hawaii 1998), the United States District Court for the District of Hawaii ruled that the Service could not rely on the ``increased threat'' rationale for a ``not prudent'' determination without evidence of a specific threat to the species at issue or a similarly situated species. In Natural Resources Defense Council v. U.S. Department of the Interior, 113 F. 3d 1121, 1125 (9th Cir. 1997), the United States Court of Appeals for the Ninth Circuit ruled that, in order to invoke the ``increased threat rationale'' the Service must balance the threat against the benefit to the species of designating critical habitat. The recent court decisions have stated that, in the absence of a finding that the designation of critical habitat would increase threats to a species, if there are any benefits to critical habitat designation (e.g., an educational or informational benefit that can assist in the conservation of the species), then a prudent finding is warranted and the existence of another type of protection, even if potentially greater, does not justify a not prudent finding.

At this time we do not have documented evidence for the collection, trade, vandalism, or other unauthorized human disturbance specific to the Appalachian elktoe, or a similarly situated species. Consequently, we cannot make a ``not prudent'' determination for the designation of critical habitat for the Appalachian

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elktoe on the basis of an expected increase in the degree of threat to the species from collecting, vandalism, or other take as a result of the designation of critical habitat. Because the designation of critical habitat may provide some conservation benefit to the Appalachian elktoe by providing additional information about its habitat requirements to individuals, local and State governments, and others interested in assisting in conservation efforts for the species, we cannot support a determination that the designation of critical habitat would not be beneficial to the species.

Issue 12: One respondent requested information concerning the steps taken to determine the status of the Appalachian elktoe and ``who is using, has used, or has stated intent to use it (the species' status) for what stated purpose.''

Response: In listing the Appalachian elktoe as an endangered species (59 FR 60324) and determining the areas we consider essential for the conservation of the species (the areas we are designating as

critical habitat), we used the best scientific and commercial information available to us concerning the species' historical range, present range, life history and habitat requirements, and factors that have contributed to its decline and those that pose a threat to its continued existence. This information was obtained from a variety of sources, including surveys and studies conducted by State, Federal, university, and private biologists and researchers and a review of published and unpublished literature. A summary of this information and the sources used is provided in the recovery plan for the Appalachian elktoe (Service 1996) and in the ``Background'' sections of the final rule listing the Appalachian elktoe as an endangered species (59 FR 60324), the proposed rule to designate critical habitat for the Appalachian elktoe (66 FR 9540), and in this final rule designating critical habitat for the Appalachian elktoe. The steps taken in compiling, analyzing, and disseminating this information, as well as the dates of the steps taken, are outlined in the ``Previous Federal Actions'' section of the final rule listing the Appalachian elktoe as endangered, the proposed rule to designate critical habitat for the Appalachian elktoe, and this final rule.

We cannot speak for other agencies, organizations, or individuals, but our purpose and intent in listing the Appalachian elktoe as an endangered species and in designating critical habitat for the species is to fulfill our obligations and responsibilities under the Act and to assist other agencies, organizations, and individuals in fulfilling their obligations under the Act.

In enacting the Act, Congress declared that species of fish, wildlife, and plants in the United States in danger of, or threatened with, extinction are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people. The Service and the National Marine Fisheries Service are the two primary agencies responsible for administering the Act. Our purposes and responsibilities through the Act are to identify endangered and threatened species, protect these species, and provide a means to conserve their ecosystems.

Issue 13: Several respondents questioned the economic benefits of the designation of critical habitat for the Appalachian elktoe mentioned by supporters of the proposed designation. Three of these respondents specifically mentioned a citation of the potential economic benefit of the designation to ``mussel harvest in the State of Tennessee.''

Response: There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered or threatened species. Such benefits have also been ascribed to the preservation of open space and biodiversity, both of which are associated with species conservation. Likewise, a local and regional economy can benefit from the preservation of healthy populations of endangered and threatened species and the habitat on which these species depend. However, these benefits would be most closely associated with the listing of a species as endangered or threatened, because listing serves to provide the majority of the protection and conservation benefits afforded under the Act.

With regard to the comments concerning ``mussel harvest,'' we have not identified, either in the proposed rule to designate critical habitat for the Appalachian elktoe or in the draft economic analysis of the proposed designation of critical habitat for the Appalachian elktoe (or any other document associated with the proposed designation), the potential benefit to the commercial harvest of freshwater mussels that may be derived from the protection of Appalachian elktoe habitat. While certain species of freshwater mussels are harvested in some

southeastern States (including some areas in western Tennessee) for their shells for use in the cultured pearl industry (plugs are cut from the shells, formed into beads, and inserted into marine oysters to assist in the formation of pearls), the shell of the Appalachian elktoe is not thick enough to be of value to this industry. Furthermore, no mussel species and no areas where their collection is permitted (the nearest river reach where the harvesting of mussels for the cultured pearl industry is allowed is the Tennessee River in northern Alabama) occur in close enough proximity to the areas that support the Appalachian elktoe to receive benefit from water and habitat quality protection that may be attributable to measures implemented for the protection of the Appalachian elktoe and its habitat.

Issue 14: One respondent questioned why a public hearing on the proposed designation of critical habitat was not held in the Nolichucky River watershed in Mitchell County or Yancey County, NC.

Response: Our regulations require that we hold at least one public hearing, if a public hearing is requested. Because the majority of the comments we received were from organizations and individuals in Tennessee and because a portion of the Nolichucky River was the only area in Tennessee proposed for the designation of critical habitat for the Appalachian elktoe, we elected to hold one of the hearings in Erwin, TN. Erwin is within the Nolichucky River system and is located in Unicoi County, TN, immediately across the State line from Mitchell and Yancey Counties, NC. We elected to hold the second public hearing in Bryson City, Swain County, NC, as a central location to cover the portions of the Cheoah River (Graham County), Little Tennessee River (Swain and Macon Counties), Tuckasegee River (Swain and Jackson Counties), and West Fork Pigeon River and Pigeon River (Haywood County) being proposed for the designation of critical habitat. Also, following the public hearings, at the request of the County Manager, Yancey County, NC, we attended a meeting of the Yancey County Board of Commissioners where we gave a presentation about the proposed designation of critical habitat for the Appalachian elktoe to the commissioners and the public in attendance.

Issue 15: We received several comments addressing the economic and demographic data for Mitchell County, NC, that were presented in the draft economic analysis.

Response: In response to the information received, we have revised the data concerning the human population, population growth, and per capita income for Mitchell County, NC,

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in the addendum to the economic analysis of critical habitat designation for the Appalachian elktoe.

Issue 16: Several of the respondents stated that the draft economic analysis failed to adequately assess the potential economic benefits of the designation of critical habitat for the Appalachian elktoe.

Response: In the addendum to the draft economic analysis, we have provided additional information concerning, and an analysis of, the potential economic benefits associated with measures implemented for the protection of water and habitat quality that may occur and be attributable to the effects of future section 7 consultations under the Act for the Appalachian elktoe and its designated critical habitat. However, it is not possible to fully describe and accurately quantify all the benefits of potential future section 7 consultations in the context of the economic analysis. And, as stated in the draft economic analysis, we believe the benefits are best expressed in biological terms that can be weighed against the potential costs of the rulemaking.

Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management consideration or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. Pursuant to regulations at 50 CFR 424.12(e), areas outside the geographical area presently occupied by the species shall be designated as critical habitat only when a designation limited to its present range would be inadequate to ensure the conservation of the species. ``Conservation'' is defined in section 3(3) of the Act as the use of all methods and procedures necessary to bring endangered or threatened species to the point where listing under the Act is no longer necessary. Regulations under 50 CFR 424.**02**(j) define ``special management considerations or protection'' to mean any methods or procedures useful in protecting the physical and biological features of the environment for the conservation of listed species.

In order to be included in a critical habitat designation, the habitat must first be ``essential to the conservation of the species.'' Critical habitat designations identify, to the extent known using the best scientific data available, habitat areas that provide essential life cycle needs of the species (i.e., areas on which are found the primary constituent elements, as defined at 50 CFR 424.12(b)).

Section 4 of the Act requires that we designate critical habitat for a species at the time of listing, to the extent such habitat is determinable. We are required to designate those areas we know to be critical habitat, based on the best information available to us. When designating critical habitat, we will designate only areas currently known to be essential. Essential areas should already have the features and habitat characteristics that are necessary to sustain the species. We will not speculate about what areas might be found to be essential if better information became available or what areas may become essential over time.

Our regulations state that, ``The Secretary shall designate as critical habitat areas outside the geographical area presently occupied by a species only when a designation limited to its present range would be inadequate to ensure the conservation of the species'' (50 CFR 424.12(e)). Accordingly, unless the best available scientific data demonstrate that the conservation needs of the species cannot be met within currently occupied areas, we will not designate critical habitat in areas outside the geographical area presently occupied by the species.

Our Policy on Information Standards Under the Endangered Species Act, published in the Federal Register on July 1, 1994 (59 FR 34271), provides criteria, establishes procedures, and provides guidance to ensure that decisions made by us represent the best scientific and commercial data available. This policy requires our biologists, to the extent consistent with the Act and with the use of the best scientific and commercial data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat. When determining which areas are critical habitat, a primary source of information should be the listing package for the species and the recovery plan, if one has been adopted by us. Additional information may be obtained from articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status

surveys and studies, biological assessments or other unpublished materials (i.e., gray literature), and expert opinions.

Section 4 of the Act requires that we designate critical habitat based on what we know at the time of the designation. Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize that the designation of critical habitat may not include all of the habitat areas that may eventually be determined to be necessary for the conservation of the species. For these reasons, it should be understood that critical habitat designations do not signal that habitat outside the designation is unimportant or that it may not be necessary for the conservation of the species. Areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) of the Act and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard and the section 9 take prohibition, as determined on the basis of the best available information at the time of the action. We anticipate that federally funded or assisted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans, or other species conservation planning efforts if new information available to these planning efforts calls for a different outcome.

Section 4(b)(2) of the Act requires us to base critical habitat designations on the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. We may exclude areas from critical habitat designation if we determine that the benefits of excluding those areas outweigh the benefits of including the areas within the critical habitat, provided the exclusion will not result in the extinction of the species.

Methods

As required by section 4(b)(2) of the Act and regulations at 50 CFR 424.12, we used the best scientific data available to determine areas that contain the physical and biological features that are essential for the conservation of the Appalachian elktoe. This included information from the listing package for the species, the recovery plan, scientific publications, recent surveys and reports, and conversations with other Federal, State, and private biologists and researchers familiar with the species.

The areas of critical habitat described below constitute our best assessment of the areas needed for the conservation of

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the Appalachian elktoe in accordance with the goals outlined in our recovery plan for the species (Service 1996) and are based on the best scientific information currently available to us concerning the species' known present and historical range, habitat, biology, and threats. The recovery plan for the Appalachian elktoe states that the species will be considered for delisting when a total of six distinct, viable populations exist and other criteria outlined in the plan are met (Service 1996). Based on the most recent survey data for the Appalachian elktoe, there are currently six surviving populations of the species (see ``Background'' section above). The areas in the six units that we are designating as critical habitat for the species include habitat for each of these populations. All of the areas we are

designating as critical habitat are within what we believe to be the geographical area occupied by the Appalachian elktoe, include all known surviving occurrences of the species, are essential for the conservation of the species, and provide for the species' essential life cycle needs. These designated areas are distributed throughout the Appalachian elktoe's range, with at least one occurring in each of the Little Tennessee, French Broad, and Nolichucky River systems. In addition, given the threats to the species' habitat discussed in the final listing rule (59 FR 60324) and the recovery plan for the species (Service 1996), and summarized in the ``Background'' section above, we believe these areas may need special management consideration or protection.

We will continue, with the assistance of other Federal, State, and private researchers, to conduct surveys and research on the species and its habitat. If new information becomes available indicating that other areas within the Appalachian elktoe's historical range are essential to the conservation of the species and provide for the essential life cycle needs of the species, we will revise the critical habitat designation for the Appalachian elktoe accordingly.

Primary Constituent Elements

In accordance with sections 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, we are required to base critical habitat determinations on the best scientific data available and to consider those physical and biological features (primary constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection. These physical and biological features include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distribution of a species (50 CFR 424.12(b)).

When considering areas for designation as critical habitat, we are required to focus on the principal biological and physical constituent elements within the defined area that are essential to the conservation of the species (50 CFR 424.12 (b)). Although additional information is needed to better define the habitat requirements of the Appalachian elktoe, particularly the microhabitat requirements, based on the best available information concerning the habitat and life history of the Appalachian elktoe (see ``Background'' section above), the primary constituent elements essential for the conservation of the Appalachian elktoe are:

1. Permanent, flowing, cool, clean water;
2. Geomorphically stable stream channels and banks;
3. Pool, riffle, and run sequences within the channel;
4. Stable sand, gravel, cobble, and boulder or bedrock substrates with no more than low amounts of fine sediment;
5. Moderate to high stream gradient;
6. Periodic natural flooding; and
7. Fish hosts, with adequate living, foraging, and spawning areas for them.

Critical Habitat Designation

The areas designated as critical habitat for the Appalachian elktoe total approximately 231.1 km (144.3 mi) of rivers. Table 1 summarizes

the location and extent of designated critical habitat. All of the designated areas require special management considerations to ensure their contribution to the conservation of the Appalachian elktoe.

Table 1.--Approximate Lengths of Streams Designated as Critical Habitat for t

State	County	Unit and stre
North Carolina	Macon and Swain...	Unit 1-Little Tennessee Riv
	Jackson and Swain.	Unit 2-Tuckase River.
	Graham	Unit 3-Cheoah River.
	Transylvania	Unit 4-Little River.
	Haywood	Unit 5-West Fo Pigeon River Pigeon River.
	Yancey	Unit 6-South T River.
	Yancey	Unit 6-Cane Ri
	Yancey and Mitchell.	Unit 6-North T River.
	Yancey and Mitchell.	Unit 6-Toe Riv

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North Carolina and Tennessee	Yancey and Mitchell (NC) and Unicoi (TN).	Unit 6-Nolichu River.

The lateral extent of designated critical habitat within units 1 to 6 is the ordinary high water line on each bank. As defined in 33 CFR 329.11, the ordinary high water line on non-tidal rivers is the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas.

We are designating the following areas as critical habitat for the Appalachian elktoe:

Unit 1. Macon County and Swain County, NC

Unit 1 encompasses approximately 38.5 km (24 mi) of the main stem of the Little Tennessee River, from the Lake Emory Dam at Franklin, Macon County, NC, downstream to the backwaters of Fontana Reservoir in Swain County, NC. This unit is part of the currently occupied range of the Appalachian elktoe and, based on the best available information, provides the physical and biological habitat elements necessary for the life cycle needs of the species. The area supports one of the only three known surviving populations of the Appalachian elktoe in the Little Tennessee River system. Based on our consideration of the best available information, including the recovery goals and criteria

outlined in the recovery plan for the Appalachian elktoe (Service 1996), protection of this unit is essential to the conservation of the species.

Unit 2. Jackson County and Swain County, NC

Unit 2 encompasses approximately 41.6 km (26 mi) of the main stem of the Tuckasegee River (Little Tennessee River system), from the N.C. State Route 1002 Bridge in Cullowhee, Jackson County, NC, downstream to the N.C. Highway 19 Bridge, north of Bryson City, Swain County, NC. This unit is part of the currently occupied range of the Appalachian elktoe and, based on the best available information, provides the physical and biological habitat elements necessary for the life cycle needs of the species. The area supports one of the only three known surviving populations of the Appalachian elktoe in the Little Tennessee River system. Based on our consideration of the best available information, including the recovery goals and criteria outlined in the recovery plan for the Appalachian elktoe (Service 1996), protection of this unit is essential to the conservation of the species.

Unit 3. Graham County, NC

Unit 3 encompasses approximately 14.6 km (9.1 mi) of the main stem of the Cheoah River (Little Tennessee River system), from the Santeetlah Dam, downstream to its confluence with the Little Tennessee River. This unit is part of the currently occupied range of the Appalachian elktoe and, based on the best available information, provides the physical and biological habitat elements necessary for the life cycle needs of the species. The area supports one of the only three known surviving populations of the Appalachian elktoe in the Little Tennessee River system. Based on our consideration of the best available information, including the recovery goals and criteria outlined in the recovery plan for the Appalachian elktoe (Service 1996), protection of this unit is essential to the conservation of the species.

Unit 4. Transylvania County, NC

Unit 4 encompasses approximately 7.5 km (4.7 mi) of the main stem of the Little River (French Broad River system), from the Cascade Lake Power Plant, downstream to its confluence with the French Broad River. This unit is part of the currently occupied range of the Appalachian elktoe and, based on the best available information, provides the physical and biological habitat elements necessary for the life cycle needs of the species. The area supports one of the only two known surviving populations of the Appalachian elktoe in the French Broad River system. Based on our consideration of the best available information, including the recovery goals and criteria outlined in the recovery plan for the Appalachian elktoe (Service 1996), protection of this unit is essential to the conservation of the species.

Unit 5. Haywood County, NC

Unit 5 encompasses approximately 17.8 km (11.1 mi) of the main stem of the West Fork Pigeon River (French Broad River system), from the confluence of the Little East Fork Pigeon River, downstream to the confluence of the East Fork Pigeon River, and the main stem of the Pigeon River, from the confluence of the West Fork Pigeon River and the East Fork Pigeon River, downstream to the N.C. Highway 215 Bridge crossing, south of Canton, NC. This unit is part of the currently

occupied range of the Appalachian elktoe and, based on the best available information, provides the physical and biological habitat elements necessary for the life cycle needs of the species. The area supports one of the only two known surviving populations of the Appalachian elktoe in the French Broad River system. Based on our consideration of the best available information, including the recovery goals and criteria outlined in the recovery plan for the Appalachian elktoe (Service 1996), protection of this unit is essential to the conservation of the species.

Unit 6. Yancey County and Mitchell County, NC, and Unicoi County, TN

Unit 6 encompasses approximately 5.9 km (3.7 mi) of the main stem of the North Toe River, Yancey and Mitchell Counties, NC, from the confluence of Big Crabtree Creek, downstream to the confluence of the South Toe River; approximately 22.6 km (14.1 mi) of the main stem of the South Toe River, Yancey County, NC, from the N.C. State Route 1152 Bridge, downstream to its confluence with the North Toe River; approximately 34.6 km (21.6 mi) of the main stem of the Toe River, Yancey and Mitchell Counties, NC, from the confluence of the North Toe River and the South Toe River, downstream to the confluence of the Cane River; approximately 26.4 km (16.5 mi) of the

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main stem of the Cane River, Yancey County, NC, from the N.C. State Route 1381 Bridge, downstream to its confluence with the Toe River; and approximately 21.6 km (13.5 mi) of the main stem of the Nolichucky River from the confluence of the Toe River and the Cane River in Yancey County and Mitchell County, NC, downstream to the U.S. Highway 23/19W Bridge southwest of Erwin, Unicoi County, TN. This unit is part of the currently occupied range of the Appalachian elktoe and, based on the best available information, provides the physical and biological habitat elements necessary for the life cycle needs of the species. The area supports the only two known surviving populations of the Appalachian elktoe in the Nolichucky River system. Based on our consideration of the best available information, including the recovery goals and criteria outlined in the recovery plan for the Appalachian elktoe (Service 1996), protection of this unit is essential to the conservation of the species.

Land Ownership

Of the areas that we are designating as critical habitat for the Appalachian elktoe, approximately 67 percent--14.4 km (9.0 mi)--of the Nolichucky River is bordered by the Pisgah National Forest in North Carolina and the Cherokee National Forest in Tennessee; 88 percent--12.8 km (8.0 mi)--of the Cheoah River is bordered by the Nantahala National Forest; and a small percentage of the Tuckasegee River is bordered by land belonging to The Eastern Band of Cherokee Indians. The remaining areas that we are designating as critical habitat for the Appalachian elktoe, with the exception of State road and highway rights-of-way, are bordered by land under private ownership.

Effects of Critical Habitat Designation

Designating critical habitat does not, in itself, lead to the recovery of a listed species. The designation does not establish a reserve, create a management plan, establish numerical population goals, prescribe specific management practices (inside or outside of

critical habitat), or directly affect areas not designated as critical habitat. Specific management recommendations for areas designated as critical habitat are most appropriately addressed in recovery and management plans and through section 7 consultations and section 10 permits.

Critical habitat receives regulatory protection only under section 7 of the Act through the prohibition against the destruction or adverse modification of designated critical habitat by actions carried out, funded, or authorized by a Federal agency. Aside from the protection that may be provided under section 7, the Act does not provide other forms of protection to land designated as critical habitat. Because consultation under section 7 of the Act does not apply to activities on private or other non-Federal land that do not involve a Federal action, critical habitat designation would not afford any protection under the Act against such activities. Accordingly, the designation of critical habitat will not have any regulatory effect on private or State activities unless those activities require a Federal permit, authorization, or funding.

Section 7(a)(2) of the Act and regulations at 50 CFR 402.10 require Federal agencies to ensure, in consultation with us, that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of designated critical habitat. ``Destruction or adverse modification'' is defined as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of the listed species for which critical habitat was designated. Such alternations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical (50 CFR 402.02).

Activities on Federal land, activities on private or State land carried out by a Federal agency, or activities receiving funding or requiring a permit from a Federal agency that may affect the designated critical habitat of the Appalachian elktoe will require consultation under section 7 of the Act. However, pursuant to section 7 of the Act and the related consultation regulations, Federal agencies also are required to consult with us on any action that may affect a listed species and to ensure that actions they authorize, fund, or carry out do not jeopardize the continued existence of listed species. Activities that jeopardize listed species are defined as actions that ``directly or indirectly, reduce appreciably the likelihood of both the survival and recovery of a listed species' (50 CFR 402.02). Federal agencies are prohibited from jeopardizing listed species through their actions, regardless of whether critical habitat has been designated for the species.

Common to the definitions of both ``jeopardy'' and ``destruction or adverse modification of critical habitat'' is the concept that the likelihood of both survival and recovery of the species are appreciably reduced by the action. Because of the small size of the surviving populations of the Appalachian elktoe, the species' restricted range, and the limited amount of suitable habitat available to the species, and because all of the units that we are designating as critical habitat for the Appalachian elktoe currently support populations of the species, actions that are likely to destroy or adversely modify the Appalachian elktoe's critical habitat are also likely to jeopardize this species. Accordingly, even though Federal agencies will be required to evaluate the potential effects of their actions on any habitat that is designated as critical habitat for the Appalachian elktoe, this designation would not be likely to change the outcome of section 7 consultations.

If, through section 7 consultation, a Federal agency determines that an action or activity they are proposing may adversely affect a listed species and/or designated critical habitat, we will issue a biological opinion determining whether the effects of the action are likely to jeopardize the continued existence of the species and/or destroy or adversely modify designated critical habitat. If we issue a biological opinion concluding that the action is likely to jeopardize the species or destroy or adversely modify designated critical habitat, we will also provide reasonable and prudent alternatives to the project, if any are identifiable. Reasonable and prudent alternatives are defined as alternative actions that can be implemented in a manner that is consistent with the intended purpose of the action, that is consistent with the scope of the Federal agency's legal authority and jurisdiction, that is economically and technologically feasible, and that the Director of the Service believes would avoid jeopardizing the species' continued existence and/or the destruction or adverse modification of designated critical habitat.

Section 4(b)(8) of the Act requires us to briefly describe and evaluate, in any proposed or final regulation that designates critical habitat, those activities involving a Federal action that may destroy or adversely modify such habitat or may be affected by such designation. Activities that may destroy or adversely modify critical habitat are, as discussed above, those that alter the primary constituent elements to the extent that the value of critical habitat for both the survival and recovery of the Appalachian elktoe is appreciably diminished. This may include any activity, regardless of the location of the activity in relation to designated critical

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habitat, that would significantly alter the natural flow regime, channel morphology or geometry, or water chemistry or temperature of any of the six designated critical habitat units, as described by the primary constituent elements, or any activity that could result in the significant discharge or deposition of sediment, excessive nutrients, or other organic or chemical pollutants into any of the six designated critical habitat units. Such Federal activities include (but are not limited to) carrying out or issuing permits, authorizations, or funding for reservoir construction; stream and/or stream-bank alterations; wastewater facility development; hydroelectric facility construction and operation; pesticide/herbicide applications; forestry operations; and road, bridge, and utility construction. These same activities also have the potential to jeopardize the continued existence of the Appalachian elktoe, and Federal agencies are already required to consult with us on these types of activities, or any other activity, that may affect the species.

Requests for copies of the regulations on listed wildlife and inquiries about prohibitions and permits, or questions regarding whether specific activities will constitute adverse modification of critical habitat, may be addressed to the U.S. Fish and Wildlife Service, Asheville Field Office (see ADDRESSES section).

Economic Analysis

Section 4(b)(2) of the Act requires us to designate critical habitat on the basis of the best scientific information available and to consider the economic and other relevant impacts of designating a particular area as critical habitat. We may exclude areas as critical habitat upon reaching a determination that the benefits of such exclusion outweigh the benefits of specifying such areas as critical