

United States Department of the Interior

FISH AND WILDLIFE SERVICE Chesapeake Bay Field Office 177 Admiral Cochrane Drive Annapolis, MD 21401

September 18, 1998

Colonel Allan B. Carroll
District Engineer
Norfolk District, Corps of Engineers
803 Front Street
Norfolk, VA 23510-1096

Attn: Ms. Melissa Smith

Re: Biological Opinion,
Regional Raw Water Supply Project

Dear Colonel Carroll:

The U.S. Fish and Wildlife Service (Service) has reviewed the permit application (#93-0902) for the Regional Raw Water Supply Plan and King William Reservoir IV with a pumpover from the Mattaponi River. The proposed reservoir is located in King William County, Virginia, and the water intake structure is proposed for Scotland Landing on the Mattaponi River. Your February 2, 1998 request for formal consultation was received on February 5, 1998. This document represents the Service's biological opinion on the effects of that action on *Isotria medeoloides*, the small whorled pogonia, and *Aeschynomene virginica*, the sensitive joint-vetch, both Federally listed threatened species, in accordance with Section 7 of the Endangered Species Act of 1973, as amended, (16. U.S.C. 1531 *et seq.*).

This biological opinion is based on information provided in the January 1998 biological assessment, the January 24, 1997 Final Environmental Impact Statement (EIS), field investigations, and other sources of information.

CONSULTATION HISTORY

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

BIOLOGICAL OPINION

Description of the Proposed Action

The Regional Raw Water Study Group (RRWSG) has submitted a modified application to construct a 78 foot high by 1,700 foot long earthen dam on Cohoke Creek in King William County, Virginia. The dam would be located approximately 0.2 miles downstream of the Route 626 crossing of Cohoke Creek, to provide a raw water storage reservoir (Figure 1, location map from the Biological Assessment). The King William Reservoir IV dam would impound a surface area of 1526 acres at a normal water surface elevation of 96 feet above mean sea level (MSL). A raw water intake and pumping station would be constructed at Scotland Landing on the Mattaponi River, King William County, Virginia. The raw water intake would have a withdrawal capacity of 75 million gallons per day (mgd), although the rate of average daily withdrawal is anticipated to be in the range of 32.6 mgd. River withdrawals would be accomplished through 12, 7 foot diameter wedge-wire intake screens arranged in a single row parallel to the shoreline, approximately 140 feet channelward of mean high water. Approximately 6,000 cubic yards of material will be excavated from the Mattaponi River bottom to facilitate the installation of the intake structure. A 72 foot long pier with an enclosed boathouse would be constructed adjacent to the intake structure to provide mooring and storage of a boat for use in water quality sampling and screen maintenance. Other components of the project, not immediately relevant to effects on Federally listed species, are described in the Norfolk District's January 24, 1997 public notice on the Final EIS.

The Virginia Department of Environmental Quality, Water Protection Permit issued for the project in December, 1997 has stipulated flow levels in the Mattaponi River under which the Regional Raw Water Study Group would not be allowed to withdraw water. The applicant can withdraw water when the volume of water in the Mattaponi exceeds a monthly amount determined by the historical flow regime record (an 80 % exceedence level), modified to account for cumulative withdrawals from the river. The applicant would have to abide by the more restrictive permit conditions stipulated by either the Commonwealth of Virginia, or the U.S. Army Corps of Engineers, if granted.

Rangewide Species Status

Small whorled pogonia

Small whorled pogonia was Federally listed as endangered on September 10, 1982, and listed as a State endangered species by Virginia in 1985. In order to describe the status of small whorled pogonia across its range, a review of terminology may be a useful precursor. A site is considered to be the proximal area where one isolated small whorled pogonia colony or a cluster of colonies occurs. All the colonies comprising a site are usually in the same watershed and are usually separated from one another

by no more than 1/4 - 1/2 mile. A colony is a single natural grouping of plants in a particular locality. There may be gaps between clusters of stems within the colony, but there should be no large disjunctions and no major habitat discontinuities. The terms group, subgroup, population, and subpopulation are frequently found in the literature and are approximate synonyms for colony (USFWS, 1992).

The small whorled pogonia has broad but sparse primary distribution in the Atlantic Seaboard states from Maine to Georgia, with outlying occurrences in the midwest United States and Canada. There are three main population centers of small whorled pogonia. The northernmost is centered in the foothills of the Appalachian Mountains in New England and northern coastal Massachusetts, with one outlying site in Rhode Island. A second grouping is located in the Blue Ridge Mountains where North Carolina, South Carolina, Georgia, and Tennessee join.

The third center, with approximately 28 sites, is concentrated in the Coastal Plain and Piedmont provinces of Virginia, with outliers in Delaware and New Jersey. Seven sites scattered in the outlying states and Ontario are considered disjunct populations (USFWS, 1994). A summary of 1996 rangewide population data is listed in Appendix B, Tables 1 and 2. The small whorled pogonia was reclassified from endangered to threatened on November 7, 1994, because the recovery objective of having over 25 percent of the known viable sites (as of 1992) protected was achieved.

As stated in the Small Whorled Pogonia Recovery Plan, First Revision (1992), colony sizes and stem counts can fluctuate widely on an annual basis, therefore population dynamics must be factored into both the decline and recovery of the species. In addition, the criteria for what previously constituted an individual site or colony have been reexamined, to try to improve consistency in designation. Therefore, the overall numbers of sites may have decreased slightly with this new accounting, but the trend of increased colonies of pogonia discovered with enhanced searching and monitoring efforts is clear. The Virginia Department of Conservation and Recreation (DCR), Division of Natural Heritage data records indicate that a number of new sites and colonies have been located since the early 1990s, although a large number of sites are comprised of very few plants (5 or less). Only two sites in Virginia have been assigned "excellent" or "good" element occurrence ranks (evaluating the plant throughout its range), in terms of quality, condition, viability, and protection.

One of the reasons that colony sizes fluctuate significantly among years is that small whorled pogonia can exhibit plant dormancy. Dibble (1998) reported the unusual finding of two plants emerging after seven years of dormancy in a New Hampshire colony that was closely monitored for seventeen years. Other investigators have documented dormancies of four years.

Sensitive joint-vetch

Sensitive joint-vetch was Federally listed as threatened on June 19, 1992. Within the plant's distribution, Virginia is clearly the stronghold of extant sensitive joint-vetch populations. Extant populations are found in coastal New Jersey, Maryland, Virginia and North Carolina. The historical range for the species extended to New Castle County, Delaware. Sensitive joint-vetch is known from

six river systems in Virginia - the Potomac, Rappahannock, Mattaponi, Pamunkey, Chickahominy, and James. The DCR, Division of Natural Heritage database lists 12 historical and 16 extant occurrences of sensitive joint-vetch as of October, 1997. Several of the extant populations are comprised of a number of subgroups, which were formerly counted as their own individual occurrence. The sensitive joint-vetch plants found at White Oak Landing across the river from Garnetts Creek Marsh are considered a subgroup of this one larger occurrence. Holts Creek Marsh on the Pamunkey River in New Kent County is partially owned by The Nature Conservancy and is the only site in Virginia that receives any form of land protection. None of the historical occurrences has been seen since the 1915 - 1940 period, and suitable habitat no longer exists at several of these locations.

Three extant sensitive joint-vetch populations occur in Maryland. Two sites contain less than 10 plants each, whereas the Somerset County population is found in two strong occurrences, one of which has varied from 1300 plants to 125 plants, and the other has ranged from 715 to 1450 plants in recent years (FWS, 1995 and C. Schulz, pers. comm.). Maryland's Potomac River marshes are yet to be extensively surveyed for sensitive joint-vetch, although the potential remains good for finding the species there. The one extant population of sensitive joint-vetch in New Jersey is located on the Manamuskin River in Cumberland County. This site contains thousands of plants (average of 9 years of data = 1843 stems), and is partially located within The Nature Conservancy's Manamuskin River Preserve. Eight other historical sites in New Jersey no longer support sensitive joint-vetch. All recent sensitive joint-vetch records from North Carolina have been documented only in disturbed habitats such as roadside ditches and wet cornfields that are nearly tidal. The species is no longer present at any historical locality, and intensive field work in North Carolina's estuarine freshwater tidal marshes during 1990 did not reveal any new sensitive joint-vetch occurrences (FWS, 1995).

The need to protect suitable habitat and physical parameters for sensitive joint-vetch appears critical, as the presence or magnitude of a colony in any given year is not predictable with our current state of knowledge. Several Virginia occurrences are demonstrating a pattern of sensitive joint-vetch appearing some years and being absent for a number of years, perhaps as conditions become less suitable. The Stafford County occurrence at Brent Marsh had no plants in 1995 and 1996, and surpassed previous high of 30 plants with 85 plants in 1997 following some scouring floods on the Potomac River. In the Rappahannock Basin of Essex County, the occurrence at Piscataway Creek was first observed in 1984 with 11 plants, then no plants were found in subsequent searches in 1987, 1991, and 1996. In 1997, 16 mature plants and several later emerging plants were found in this area after a wetland restoration project was initiated by the Virginia Department of Transportation.

Environmental baseline in the action area

Species Status in the Project Area:

Small whorled pogonia

Two colonies of small whorled pogonia were found within the area to be inundated/affected by the proposed King William Reservoir IV, which proposes a normal pool elevation of 96 feet MSL (map, Figure 2). On June 11, 1993, one plant was discovered (Colony 1) by itself on the lower section of a southwest facing slope between two small streams, approximately at elevation 86 feet MSL. The plant was seen again in 1994 and 1995, in a vegetative state. The one plant was not seen in 1996. A June 1997 survey for the plant found that the area had been recently clearcut and driven over by heavy machinery. Later in the summer of 1997, this area was burned and is now managed for pine timber rotation. Therefore, the site no longer provides suitable habitat for pogonia.

On June 3, 1994, during the reservoir wetland delineation, a colony of five small whorled pogonia (Colony 2) was discovered on an upland median between two small streams within an east-west oriented ravine. The ravine is 7.6 meters wide where the plants are located, and situated within an approximately 10 year old pine plantation. The median where the plants are located gently slopes to the east at an elevation of 64 feet MSL. All the trees in the area are young and the understory vegetation is thick (Biological Assessment, 1998).

This colony of pogonia is particularly interesting due to their larger than normal size and their reproductive status. Plants that have twin flowers are considered to be particularly well-established and to have a strong energy source (Ware, 1995). However, with five mature plants only, this colony lacks any indications of new seedling recruitment and the habitat may currently be suited solely for established plants.

As part of the project, the RRWSG proposes to negotiate with a private landowner for purchase of a conservation easement on the Casey Colony of small whorled pogonia in James City County, Virginia which is threatened by development. The applicant has discussed the extent of a proposed easement area with an expert in small whorled pogonia, and will be pursuing the matter with the property owner. This colony has an element occurrence rank of excellent. No other colony in the Virginia or Southern Blue Ridge population centers even approach the productivity of this colony. The Casey Colony is an extremely important component of the overall population of small whorled pogonia both in Virginia and throughout the entire range of the species (Ware, 1996).

Preservation of a small whorled pogonia colony on private land in Gloucester County, Virginia is being considered as a secondary option. This preservation would include the limits of the existing colony and approximately 8 acres of surrounding buffer. This colony is considered one of the larger, viable colonies in Virginia, and is not currently under any form of protection. The Biological Assessment states that the Gloucester County pogonia colony was first documented in the 1930s and extended further than its current size. Recent recorded observations of the Gloucester County colony began in 1990, with a count of approximately 41 plants. Over the next several years, the number of plants fluctuated between the low 40's to high 20's (D. Ware, pers. comm., 1998). In 1996, approximately 50 plants were seen. Only 14 plants were seen at the site in 1997, 2 of which were blooming (M. Berg, pers. comm., 1997).

Sensitive joint-vetch

Five extant occurrences of sensitive joint-vetch are located in the tidal freshwater section of the Mattaponi River, from Melrose Landing upstream to Garnetts Creek Marsh (map of intake area, Figure 3). In addition, five extant occurrences are found in the tidal freshwater section of the Pamunkey River. As the Mattaponi and Pamunkey Rivers converge to form the York River, potential salinity changes from freshwater withdrawals in one tributary have the potential to affect salinity levels in the other tributary, therefore, the action area for sensitive joint-vetch includes the tidal freshwater zones of both York River tributaries.

Effects of the action

Small whorled pogonia

Direct impacts are anticipated to Colony 2 of small whorled pogonia from the construction of the King William Reservoir IV. Since the proposed normal pool elevation is 96 feet MSL and the colony is located at approximately 64 feet MSL, this colony would be inundated by reservoir construction. Colony 1 is considered no longer extant due to clearcutting and burning, which has rendered the habitat unsuitable for pogonia.

Sensitive joint-vetch

No direct impacts to sensitive joint-vetch are anticipated from the construction and operation of a pier, boathouse and intake structure at Scotland Landing on the Mattaponi River. However, indirect impacts may occur from the withdrawal of fresh water from the river. The Service is concerned about the small probability of salinity and water quality changes which may affect the species throughout the York River basin, not just those (Garnetts Creek Marsh and subpopulation of White Oak Landing) near the proposed intake at Scotland Landing. Based on our knowledge of the species, its distribution predominantly in the lower half of the tidal freshwater zone, and its site fidelity, direct or indirect salinity-related impacts could occur, if actual conditions deviate from salinity model predictions or if other unstudied ecological relationships are altered by freshwater withdrawal.

Salinity modeling for the Regional Raw Water withdrawal was conducted by the Virginia Institute of Marine Science (VIMS), and the results were summarized in their 1991 report, Tidal Wetlands on the Mattaponi River, Potential Responses of the Vegetative Community to Increased Salinity as a Result of Freshwater Withdrawal. The VIMS report finds that, as mean salinities for the withdrawal scenario at selected up-river transects did not exceed mean salinities for the simulated historical record at adjacent down-river transects, no up-river shifts in existing vegetation as a result of increased salinities are anticipated, within the 1 kilometer limits of model resolution.

Laboratory germination studies such as conducted by Baskin and Baskin (1995) are an excellent beginning in understanding some life requisites of sensitive joint-vetch in controlled laboratory conditions. These results, however, should not be extrapolated to in-situ field conditions of

Table 1. Small whorled pogonia status within the proposed King William reservoir

Colony 1		
June 11, 1993	1 plant discovered, not flowering	
June 20, 1994	1 plant seen again, not flowering	
June, 1995	1 plant seen again, not flowering	
May, 1996	no plant seen	
June 1997	area clearcut & burned, heavy machinery impact, no plant seen	
Colony 2		
June 3, 1994	5 plants discovered, 4 with fruiting bodies (one w/ twin fruit capsules), 1 with aborted bud	
1995	5 plants observed	
May 1996	no plants observed	
June 1997	1 plant seen, not flowering; cold, dry spring	

Table 2. Extant sites of sensitive joint-vetch on the Mattaponi and Pamunkey Rivers

Mattaponi River (listed from downstream to upstream order)

<u>Site name in monitoring reports</u>	<u>Heritage sitename</u>	<u>Element Occurrence #</u>
Melrose Landing, site B \		
Melrose Landing, site A -	Melrose Landing	022
Gleason Marsh Island /		
Wakema	Wakema	026
Upper Gum Marsh	Gum Marsh	008
Garnetts Creek Marsh (and White Oak Landing)	Garnett Creek	025

Pamunkey River (listed from downstream to upstream order)

<u>Site name in monitoring reports</u>	<u>Heritage sitename</u>	<u>Element Occurrence #</u>
Clayborne Creek Marsh	Clayborne Creek	015
Sweet Hall Marsh	Sweet Hall	023
Holts Creek/Cumberland (# 001) \		
Holts Creek/Cumberland (# 005) \		

germination without further research, or be used to make conclusions on plant distribution in the field. In addition, germination is just one component of recruitment. We do not know the effects of small but chronic salinity changes on other biotic and abiotic factors directly or indirectly affecting sensitive joint-vetch. For example, we do not know how competitors with sensitive joint-vetch will fare under a different salinity or water quality regime or how their competitive interactions will change.

In addition, the Service asked the Norfolk District to examine the potential indirect impact of the intake structure and withdrawal on flow and sediment depositional patterns in the Scotland Landing - Garnetts Creek Marsh area. Dr. David Basco, a coastal engineer consulting for the permit applicant, has analyzed potential changes in water velocities and sediment transport potential in the Scotland Landing - Garnetts Creek Marsh area from the proposed construction of an intake structure. Dr. Basco concluded that a wake region with increased turbulent kinetic energy will impact the south side bank both upstream and downstream of the water intake structure. He believes, however, that the increased mean velocities and sediment transport potential are so small that the possibility for **excessive** [FWS emphasis added] erosion of Garnetts Creek Marsh and the south side shoreline (including White Oak Landing area) is minimal to nonexistent. He states that, suitable habitat for the White Oak Landing subgroup of sensitive joint-vetch is impacted by high bend velocities during natural freshwater flood events, and may also be impacted by increased levels of turbulence in the wake reaching this location during the daily cycles of the flood tide.

Dr. Basco has also examined the potential impact of the pier in terms of area, 27 ft² at mean high water (MHW) and 9ft² at mean low water (MLW). He believes the piers will have no impact on turbulence for the 6010 ft² (MLW) cross sectional area of the river at the intake. He states that wake turbulence from the piers only lasts 7 diameters (7 feet, in this case) downstream before it is blended back into the normal, open channel flow turbulence in the tidal flow in the river. He concludes that the pier pilings will not affect the White Oak Landing subgroup of sensitive joint-vetch.

Members of the public have raised the issue of the potential indirect impact of tour boats crossing the Scotland Landing/Garnetts Creek Marsh section of the Mattaponi River. The public has questioned whether the pier and boathouse structure proposed by the applicant would effect the sensitive joint-vetch population by redirecting boating traffic, and potentially erosive boat wakes, towards the North bank of the river, Garnetts Creek Marsh. From the diagrams presented to the Service by the applicant on April 8, 1998, the pier and boat house would extend approximately 16-20 feet beyond the bank level of MLW. These design diagrams and the Corps public notice on the Final EIS state a 450 foot width of waterway, and an approximately 72 foot extension of the pier from the MHW riverbank elevation, or 16% of the total river width (MHW) at the intake site. The Service does not believe this structure will direct boating traffic closer to the North bank of the river, Garnetts Creek Marsh. As we discuss in the following section on conservation recommendations, there may be ways to minimize any indirect effect of boat traffic.

Cumulative effects

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

Small whorled pogonia

The destruction of small whorled pogonia plants and habitat on private land will continue to be a cumulative threat to the species. Private land development for housing, roadways and commercial purposes is reducing small whorled pogonia current and potential habitat in Virginia. As an increasing proportion of Virginia's forests are converted to rotational pine plantations, suitable habitat for pogonia may be permanently lost. The concentration of deer onto smaller and smaller parcels of woodland is an indirect threat of development pressure that may pose an increasing threat to the small whorled pogonia. The decline of a large Virginia colony appears to be primarily due to grazing of whorls early in the season, and circumstantial evidence indicates that the grazers are deer (USFWS, 1992).

Sensitive joint-vetch

Potential cumulative impacts to sensitive joint-vetch include sedimentation, competition from exotic plant species, commercial and residential development in uplands, timber harvest, agricultural or residential pesticides, overvisitation to sensitive joint-vetch sites, changes in water quality, and introduced pest species (USFWS, 1995). The Sensitive Joint Vetch Recovery Plan notes that sedimentation of the Patuxent River in Maryland has allowed an invasive introduced species, *Phragmites australis*, to extend its range, displacing much of the wild rice that occurred historically along that river. Establishment of *P. australis* or other invasive species could be especially detrimental to sensitive joint-vetch, which thrives in an environment with little competition from other plants (USFWS, 1995). Alterations of marsh elevations by excessive sedimentation may eliminate suitable habitats for sensitive joint-vetch. Water quality degradation in streams inhabited by sensitive joint-vetch could result from uncontrolled runoff of sediments, pesticides, fertilizers, nutrient pollution. While the direct effects of water pollution on the sensitive joint-vetch are unknown, pollution generally appears to reduce species diversity within marshes, and promote the encroachment of aggressive, weedy species. Rouse (1994) noted heavy predation of sensitive joint-vetch seed pods by the corn earworm and tobacco budworm. These non-native pests were introduced to the United States several centuries ago. When the corn crop is no longer available, the tobacco budworm looks for alternate food sources and can be found in large numbers on sensitive joint vetch plants (USFWS, 1995).

Conclusion

After reviewing the current status of small whorled pogonia and sensitive joint-vetch, the environmental baseline for the ranges of each species, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Regional Raw Water Supply Plan, as proposed, is not likely

to jeopardize the continued existence of small whorled pogonia or sensitive joint-vetch. No critical habitat has been designated for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Sections 7(b)(4) and 7(o)(2) of ESA do not apply to the incidental take of listed plant species. However, limited protection of listed plants from take is provided to the extent that ESA prohibits the removal and reduction to possession of Federally listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law. In Virginia, approximately 24 colonies of small whorled pogonia are subject to the Endangered Plant and Insect Species Act of Virginia, which provides limited protection from taking. If this project is on private land and the landowner is not the project proponent, in addition to the landowner permission, a Virginia Endangered Species Permit for plants may be needed. To determine if such a permit is necessary or to apply for this permit, contact:

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

CONSERVATION RECOMMENDATIONS

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

Small whorled pogonia

The Service recommends that the Norfolk District use their authorities to enact the following prioritized actions to minimize impacts to small whorled pogonia plants and habitat to be inundated by the proposed King William IV reservoir:

- A) Ensure that easement protection of the Casey Colony in James City County is achieved before roadway or private development encroaches upon this pogonia colony or its potential habitat. Any easement(s) should be perpetual and the Service should approve the easement language before the easement is recorded.

- B) If no protection agreement is possible on the Casey Colony, after extensive efforts are expended, the Norfolk District should pursue protection of the small whorled pogonia colony in Gloucester County .

At the site selected for protection, scientists with expertise in preserve design should be involved in determining the boundaries of the protected area, such that appropriate buffer areas for disturbance protection and expansion of a colony be incorporated into the design. The easement area extent and configuration should be reviewed and approved by pogonia experts and the Service. The easement must provide resource agencies and/or designated representatives access to the site for monitoring purposes. After establishment of an easement, monitoring should be conducted by the permittee annually for eight years (through 2 cycles of potential dormancy), to assess the colony's status, and any potential threats to its continued existence. Monitoring data should be reported to the Service and the Virginia Natural Heritage office. Management actions should be taken if herbivory by deer or other threats severely impact the colony. Monitoring must be conducted by an individual or individuals proficient in the identification and biology of small whorled pogonia, to be approved by the Service.

Sensitive joint-vetch

The Service recommends that the Norfolk District use their authorities to enact the following prioritized actions to minimize impacts to the populations of sensitive joint-vetch on the Mattaponi and Pamunkey Rivers:

- A) Adoption of the minimum instream flow restrictions on raw water withdrawal from the Mattaponi River, developed by the Virginia Department of Environmental Quality in consultation with the Service, which stipulate a Mattaponi River flowby regime (water amount left for instream purposes) of a modified 80% exceedence of each month's flow duration statistics. It is essential to recognize month to month variation in freshwater flow duration regimes when setting a minimum flow, below which no pumpovers can occur. Other flow levels, based on exceedence data, close to the modified monthly 80% exceedence level could be investigated to provide additional water for several winter months. The Service does not find the applicant's proposed minimum flow of 40%/20% of Mean Annual Flow to have enough linkage to biological processes and historic flow regimes. There are many parameters beyond salinity levels that affect the functioning of the tidal freshwater ecosystem. Many riparian plants have life cycles that are adapted to the seasonal timing components of natural flow regimes through their seasonal sequence of flowering, seed dispersal, germination and seedling growth (Poff et al. 1997). When so little is known of the exact habitat requirements and ecological niche of sensitive joint-vetch, the need to closely follow the natural regime is even more critical.
- B) Implementation, as part of a proposed permit, of the Mattaponi River Monitoring Plan being developed by the multi-agency team of resource specialists from Federal, state, academic, and private organizations, in consultation with the project applicant. As part of this plan, the initial

filling of the reservoir should be controlled as a research opportunity to examine what withdrawal impacts may be like much later in the project life when higher water demands are in effect. The reservoir filling phase could depict a closer approximation to “worst case situation” than would normally be found in the early years of reservoir operation.

- C) Implementation of annual monitoring by the permittee, for a ten year period, of all extant and appropriate historic sensitive joint-vetch sites on the Mattaponi and Pamunkey Rivers. Monitoring should include stem counts, seed production estimates, predation estimates, and associations of other plant species in the marsh. The date that monitoring is to begin should be determined by the Service and the Norfolk District after evaluating the implementation schedule of intake construction and operation. Monitoring protocols must be approved by the Service and DCR’s Division of Natural Heritage to ensure appropriate methodologies and prevent damage to sensitive joint-vetch and its habitat. Monitoring must be conducted by an individual or individuals proficient in the identification and biology of sensitive joint-vetch, to be approved by the Service. Marsh access to sensitive joint-vetch sites should be secured for monitoring personnel. The Service should receive annual reports of monitoring activities.
- D) Strict control of invasive species at the Scotland Landing intake site during construction activities and after construction. Monitoring of the site seasonally for each year of intake operation to prevent and eliminate the spread of *Phragmites australis* and other invasive plant species. Control and reduction of exotic species should be coordinated with the Service to ensure these actions will not impact sensitive joint-vetch.
- E) Coordination with state and local agencies, if necessary, to appropriately mark the navigation channel after the intake structure is installed within the Mattaponi River. Proper marking of the channel could help to minimize boat wake impacts to the sensitive joint-vetch habitat at Garnetts Creek Marsh.
- F) Consideration of land acquisition or conservation easement protection of sensitive joint-vetch habitats, if wetland preservation is to be pursued to meet other mitigation objectives of the Regional Raw Water Supply Project. Protection of the Garnetts Creek Marsh and upland buffer, and the Gum Marsh and upland buffer would ensure agencies and their representatives access to monitor these large sensitive joint-vetch populations and could prevent potential upland degradation from directly affecting the marsh habitat. Any acquisition or easement would need to be in perpetual protection, and the Service must approve the configuration of upland buffers.

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

REINITIATION AND CLOSING STATEMENT

This concludes formal consultation on the actions outlined in the Norfolk District's request. As provided in 50 CFR Section 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this opinion; 2) the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in this opinion; or 3) a new species is listed or critical habitat designated that may be affected by the action.

By or before the end of the year 2007, the lifespan of the Commonwealth of Virginia's Water Protection Permit, the Norfolk District and the Service may receive additional information on potential or actual impacts to the colonies of sensitive joint-vech on the Mattaponi and Pamunkey rivers. This information, for example, may be in the form of additional research on the life history of sensitive joint-vech, or biological, water quality, and physical data from the Mattaponi River monitoring effort, which may constitute new information for a reassessment of the biological opinion.

The Service appreciates the Norfolk District's efforts to fulfill its responsibilities under the Endangered Species Act. If you need further information or assistance, please contact Ms. Janet Norman of my staff at (410) 573-4533.

Sincerely,

John P. Wolflin
Field Supervisor
Chesapeake Bay Field Office

cc: Cindy Schultz, USFWS Virginia Field Office
Molly Spurduto, USFWS New England Field Office
Paul Nickerson, US FWS Region 5, Endangered Species
Regina Poeske, USEPA Region III
John Tate, VA Department of Conservation and Recreation
Lesa Burlinghoff, VA DCR, Division of Natural Heritage
Joe Hassell, VA Department of Environmental Quality
Ray Fernald, VA Department of Game and Inland Fisheries
Donna Ware, College of William and Mary

Jim Perry, Virginia Institute of Marine Science
Bruce Schweneker, Malcolm Pirnie
Kate Sweeney, Malcolm Pirnie
Dave Morris, Newport News Waterworks
Judy Dunscomb, VA Chapter, The Nature Conservancy
Billy Mills, Mattaponi and Pamunkey Rivers Association
Ann Jennings, Chesapeake Bay Foundation
Garrie Rouse, Rouse Environmental Services

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Appendix A. Consultation History

- 2/17/93 Service provides Norfolk District a list of the Federally threatened and endangered species which may be affected by the three reservoir alternatives and withdrawals from the Pamunkey and Mattaponi.
- 6/11/93 Survey of potential small whorled pogonia habitat within proposed King William Reservoir pool locates one individual (Colony 1).
- 7/7/93 Survey (Rouse 1994) confirms a large population of sensitive joint-vetch at Garnetts Creek Marsh, across from proposed intake.
- 5/17/94 Service letter on Draft EIS finds that proposed project may affect listed species, requests formal consultation with Norfolk District as project develops.
- 5-7/94 Malcolm Pirnie and subcontractors survey proposed Ware Creek, King William, and Black Creek reservoir sites for presence of small whorled pogonia.
- 6/3/94 Second colony (Colony 2) of small whorled pogonia found within proposed King William Reservoir (KWR) pool during wetland delineation work.
- 11/22/94 Service letter to Norfolk District informs them that small whorled pogonia has been reclassified from Federally endangered to threatened status.
- 6/95 (?) Colonies 1 and 2 in KWR pool monitored by Malcolm Pirnie, no change from 1994.
- 5/96 Malcolm Pirnie did not observe any pogonia at Colony 1 or 2 in KWR pool.
- 1/24/97 Public notice announces availability of the Final EIS for the Regional Raw Water Supply Plan.
- 6/97 Malcolm Pirnie observed that Colony 1 was eliminated, and Colony 2 had one plant while monitoring pogonia in KWR pool.
- 6/5/97 Service letter to private botanist attempts to discover exact location and ownership of Gloucester County pogonia colony.
- 6/24/97 Service personnel visit Mattaponi water intake site, Garnetts Creek Marsh and White Oak locations of sensitive joint-vetch, plants not yet visible due to cold spring conditions in early growing season.