

West Virginia Field Office
Post Office Box 1278
Elkins, West Virginia 26241

March 16, 1999

Colonel Dana Robertson
District Engineer
U.S. Army Corps of Engineers
502 Eighth Street
Huntington, West Virginia 25701

Dear Colonel Robertson:

The U.S. Fish and Wildlife Service has reviewed the project plans and Biological Assessment (BA) for a barge loading and fleeting facility in the Ohio River near river mile (RM) 205.5. Letart Corporation has submitted a Rivers and Harbors Act Section 10 permit application (Public Notice No. 055103-1) to build this facility. Your letter, dated December 1, 1998 requested we initiate formal consultation pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). This document represents the Service's biological opinion on the effects that the proposed activity will have on the federally listed species, the fanshell mussel, Cyrogenia stegaria. Because the Service concurs with the "not likely to adversely affect" determination for the bald eagle, Haliaeetus leucocephalus, and the pink mucket, Lampsilis abrupta, this opinion only addresses impacts to C. stegaria.

CONSULTATION HISTORY

5/28/92 The District issues a public notice (ORHOR-F No. 92-39) that Letart Corporation 's proposed commercial loading and unloading facility along the right descending bank of the Ohio River, at RM 205.5.

6/30/92 The Service issues a "No Action" letter on the Letart public notice.

12/14/92 The District issues a permit to Letart Corporation for the loading facility. The time limit for completion of work was December 31, 1995.

11/10/93 The Service notifies the Huntington District by letter a federally endangered species, the fanshell mussel, C. stegaria was discovered in the Ohio River near River Mile (RM) 205.0. This letter requested that Section 7 consultation be initiated for proposed projects within specified reaches of the Ohio River, including the upper Racine Navigation Pool.

6/98 The District notifies the Service by phone that Letart Corporation wanted to expand their proposed commercial loading facility and that the District was considering approving this project by a Letter of Permission. The District also notes that the applicant had just begun construction on the previously permitted work, but that the District had granted the applicant an extension of time until December 21, 1998 to complete the work. The Service had not been previously notified that an extension of time had been granted.

07/24/98 The Service notifies the District by letter that the proposed project must be applied for

under individual permit and that Section 7 consultation, including the preparation of a Biological Assessment, will be required.

08/28/98 Meeting between the District, Letart Corporation, and the Service to discuss procedures for Section 7 consultation and Section 10 permit application.

10/05/98 The District issues Public Notice No. 055103-1 for a Section 10 Rivers and Harbors Act permit application for the proposed project.

11/02/98 The Service notifies the District by letter that action on the proposed permit should be deferred until completion of the Section 7 consultation process.

12/02/98 The Service receives the Biological Assessment (BA) for the Bald Eagle, Pink Mucket, and Eastern Fanshell near a Proposed Barge Loading Facility in the Ohio River, Mile 205.5 dated December 01,1998.

01/11/99 The Service notifies the District that it concurred with the determination that the proposed project “may affect” the fanshell, C. Stegaria, and is “not likely to adversely affect” the bald eagle or the pink mucket pearly mussel. However, the Service did not concur with the assessments’ analysis of indirect and cumulative effects that may occur as a result of the project, and requested additional information to support a more accurate analysis of these impacts.

BIOLOGICAL OPINION

Description of the Proposed Action

Letart Corporation currently operates a sand and gravel mining operation in the floodplain of the Ohio River near RM 205.5. The purpose of the proposed facility is to load and unload sand, gravel, grain, wood products, and other non-hazardous, non-polluting construction material and machinery. The proposed facility would consist of five 20-foot diameter sheet pile cells, and six quad-ties. Mooring cells and quad-ties will be placed 90-110 feet from the normal pool riverbank. The proposed facility will be located from RM 205.5 to a maximum distance of 1,925 ft downstream. The facility will provide fleeting for up to 24 barges.

General Biology and Life History of the Species

Freshwater mussels are sedentary filter-feeders, filtering oxygen and food from the water column. The breeding season is initiated by changes in water temperature. Females hold unfertilized eggs in water tubes within specialized regions of the gills called marsupia. Males liberate sperm into the water and females lying downstream uptake the sperm with incoming water. The eggs are then fertilized in the water tubes within the marsupium. The fertilized eggs develop into minute bivalve larvae, or glochidia, which, in turn, develop over a period of days to months. While in the marsupium, developing glochidia

are exposed to the adult's circulatory fluid, but not directly to the water column (Gardiner *et al.* 1991, Richard *et al.* 1991).

C. Stegaria is a long-term breeder (bradytic). This means that fertilization takes place in late summer/fall, and the glochidia overwinter in the female and are discharged into the water column in spring (Ortman 1919). The glochidia are believed to be obligate parasites, with fish serving as the hosts organism. Host infestation is facilitated by C. Stegaria by binding glochidia into long mucus conglutinates which resemble prey items. The gills of the host fish become infested when fish eat the conglutinates. This suggests that the host fish for this mussel visually searches for its food. Although many unionids are probably host-specific, the degree of host specificity and host species for the fanshell is unknown. However, recent studies suggest that the banded sculpin, Cottus carolinae and the greenside darter, Etheostoma blenniodes may be host fish for C. stegaria (Schultz and Marbain, 1998).

After encysting the host fish, the glochidia transform into juveniles. They then fall from their host and burrow into the substrate or attach to larger objects where they begin their sedentary existence. The fanshell inhabits clean swept sand and gravel in medium to large rivers. Many aspects of the life history of these rare mussels are not known. Like other freshwater mussels, they feed and respire by filtering microscopic food particles and oxygen from the water column.

C. Stegaria has a medium-sized shell, subcircular in outline, that seldom exceeds 80mm in length. The shell's periostracum is typically light green or yellow and decorated with green rays and green mottling, and the nacre is typically silvery white (U.S. Fish and Wildlife Service, 1991).

Review of Endangered Species Information

C. stegaria historically occurred in the Ohio River and many of its tributaries in Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Kentucky, Tennessee, Alabama, and Virginia, but has experienced drastic reductions in its range in the past century. Presently reproducing populations are known to occur in the Clinch River in Tennessee and Virginia, the Green and Licking River in Kentucky, and the Muskingum River in Ohio (U.S. Fish and Wildlife Service, 1991). Since 1992, living and fresh dead specimens indicate that a reproducing population of C. stegaria occurs in the lower Muskingum River in Ohio (Ohio Department of Natural Resources, 1993) and in the upper Ohio River in West Virginia at Neal Island, and Muskingum Island (ORINWR, pers. comm.), and below Belleville Locks and Dam (Ecological Specialists, 1998). Additionally, small apparently non-reproducing populations, may still persist in the Walhonding River in Ohio, the Kanawha River in West Virginia and Ohio, the Tippecanoe River in Indiana, the Wabash River system in Illinois and Indiana, the Barren River and Tygarts Creek in Kentucky, and the Tennessee and Cumberland Rivers in Tennessee (U.S. Fish and Wildlife Service, 1991). The Ohio River is currently functioning as a recovery area for this species.

Reasons for Decline and Continued Threats

Since mussels are sedentary, they are extremely susceptible to environmental degradation. The past range reductions of mussels are attributed to physical loss of habitat and degraded water quality related primarily to water impoundment, channelization, streambank clearing, and agriculture. Run-off from

human waste, chemical outfalls, and coal mining has affected the water quality of many tributaries.

Pollution from municipal, agricultural, and industrial waste discharges has decreased or eliminated mussel populations directly and indirectly through extirpation of host fish species, resulting in mussel reproductive failures. Recent improvements in water quality in the upper Ohio River primarily as a result of promulgated regulations pursuant to the Clean Water Act requiring sewage and mine treatment facilities, and restrictions on industrial outfalls have allowed mussels and their fish hosts to return to some of their former range. More thorough analysis of the environmental impacts of activities such as commercial sand and gravel dredging and barge loading and mooring facilities have also helped to facilitate the reestablishment of mussel and fish resources by protecting valuable physical habitat.

The greatest diversity and abundance of mussels are associated with clean-swept sand and gravel substrates. Chronic increases in turbidity and suspended sediments decrease the depth and amount of light penetration, affect primary productivity, decrease oxygen levels, increase water temperature, irritate or cause clogging of gills, and result in a blanket of silt on the substrate. Mussels may be directly affected by siltation through smothering. Siltation affects mussels by smothering eggs or larvae of the fish host populations and by reducing food availability. Siltation also fills interstitial spaces, eliminating spawning habitat critical to the survival of young fish.

The exotic and prolific zebra mussel, Dreissena polymorpha, was accidentally introduced to North America in the mid-1980's through ship ballast water from interior European ports. This species poses a severe threat to all native mussel species because it competes for space and food, and attaches to the

native mussels in numbers that impair the mussel's ability to travel, burrow, and open and close its shell. The zebra mussel densities have increased dramatically since the early 1990's, when they were first identified in the Upper Ohio River Basin, reaching up to 4,922/meters squared (m^2), a significant increase from the 225/ m^2 found in 1997 at the same location. The 1998 survey also found that 89.9% of live native unionids were infested with zebra mussels.

Environmental Baseline

The proposed facility is located in the Racine Navigation Pool of the Ohio River. The freshwater mussel fauna of the Racine Pool are characterized as being particularly diverse with 31 species identified during recent surveys. A moderately dense and species rich mussel bed is located along the right descending bank between RM 204.5 and 207.7. A total of 26 species have been identified from this bed since annual monitoring of it began in 1993. This bed is limited upstream and channelward by the navigation channel and downstream by depositional substrates. Substrates within the bed are primarily cobble, gravel, and sand. Depths reach up to 8 meters (m) between 110m and 150m from the bank and range between 1m and 6m at 10m to 50m from the bank. Total unionid densities have remained stable throughout the monitoring period, with average densities ranging from 1.6/ m^2 to 2.8/ m^2 . Most of the unionids are concentrated near the bank (0m to 50m) with average densities of 4.1/ m^2 as opposed to average densities of 0.7/ m^2 at 110m to 150m from the bank. Although the average age of total and dominant species within the bed has remained relatively stable throughout the monitoring period, the percentage of species represented by both young animals and older animals has increased over time. This indicates that reproduction is occurring and that young animals are being recruited.

Zebra mussel densities within the bed increased from 0.3/m² in 1997 to 300/m² in 1998. The percentage of unionids infested also increased from 2.6% in 1997 to over 35% in 1998. Zebra mussel densities varied throughout the bed and were significantly lower in the downstream portions of the bed which are farther away from the locks and dam.

Another unionid bed is located across the river on the left descending bank between RM 204.4 and 208.8. C. stegaria has also been found in that bed.

Reasonable and Prudent Alternatives

Regulations (50 CFR 402.02) implementing section 7 of the Act define reasonable and prudent alternatives as alternative actions, identified during formal consultation, that: (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; (3) are economically and technically feasible ; and (4) would, the Service believes, avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

The preferred alternative as proposed in the BA is located 585 feet downstream and an additional 50 feet channelward of the project as originally proposed. These alterations move the project action area into a portion of the bed that has reduced mussel densities and has greater water depths. This will

reduce direct mortality associated with project construction, eliminate the need for dredging to be included in project construction, and minimize the potential for mussels to be impacted due to prop scour and turbidity from barge activity. In addition, moving the project channelward, will allow for sufficient flows to be maintained between the mooring cells and the bank (the areas with greatest mussel density) will reduce silt and debris accumulation that would smother existing mussels in that area (Coy Miller, USCOE Huntington District, pers. comm.). The “Effects of the Action” section describes impacts associated with the “preferred alternative” as described in the BA.

Effects of the Action

Direct impacts of the proposed project include the permanent loss of approximately 645 m² of habitat within the mussel bed through the placement of the mooring cells and quad ties when constructing the facility. Increased turbidity and sedimentation associated with project construction will cause a short term impairment of habitat quality. Siltation may result in reduced dissolved oxygen and increased organic material at the substrate level. At sublethal levels, silt interferes with feeding and metabolism in general. Because the fanshell typically burrows completely beneath the substrate, it is particularly susceptible to siltation, which clogs the substrate interstices and suffocates the animal. Mortality, injury, and stress to mussels is expected from siltation and other types of sedimentation both in the project construction area and downstream. The severity of this impairment will depend on the duration of construction time and the season in which the activity is conducted. Impacts would be lessened if construction was conducted in winter months when mussels are least active, and during low flow

conditions. Removal of riparian vegetation in the project area may decrease bank stability and lead to increased erosion and sedimentation adjacent to the bank.

In addition, a long-term reduction in habitat quality will occur in the vicinity of the facility due to continuing project operations. Even though the project has been moved farther out into the river, depths around the facility will be between 12 and 20 ft. Prop scour, and associated increases in turbidity and sedimentation, still may occur at these depths. Information provided by Letart Corporation indicates that once the barge is in fleet, it will be maneuvered within the facility by the use of a winch. This would reduce the amount of prop scour and turbidity generated by fletted barges. Approaching and departing barges, particularly if they passed directly over the up or downstream portions of the mussel bed, would cause the greatest increases in prop scour and turbidity.

Construction of the facility will increase the duration and frequency of barge traffic over the affected bed. Letart Corporation estimates that the facility will handle approximately 60 barges per month, and that these barges will be moored at the facility for 3 to 4 days each. Because barges are known to transport zebra mussels into an area, it is expected that the introduction rate of zebra mussels into the area will increase. High zebra mussel densities have been shown to correlate with unionid mortality (Schlosser and Nalepa, 1994; Nalepa et al, 1996; Ricciardi et al, 1995). Unionid mortality has been observed in the Ohio River in areas with zebra mussel density of $<1000 \text{ m}^2$ (Morrison, pers. comm.). The cumulative effects of increased sedimentation and turbidity, and increased zebra mussel infestation will impair the habitat quality of the area and increase stress on the existing mussels. Although not

quantifiable, the long-term indirect effect of project operations will likely have a greater adverse impact on the mussel bed than the direct effects of project construction.

Conclusion

After reviewing the current status of the fanshell, the environmental baseline of the action area, and the effects of the proposed barge loading facility, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the fanshell. No critical habitat has been designated for this species therefore, none will be affected.

Incidental Take Statement

Sections 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without any exception. Harm is further defined to include significant habitat modification or degradation that results in death or injury to species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking

provided that such taking is in compliance with the terms and conditions of the incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the Corps of Engineers so that they become binding conditions of any funding, permits, and/or approvals, as appropriate, issued to the applicant for the exception in section 7(o)(2) to apply. The Corps of Engineers has the continuing duty to regulate the activity covered by this incidental take statement. If the Corps of Engineers (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, authorization, or funding document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps of Engineers or the applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.12 (I)(3)].

Amount or Extent of Take

Construction of the proposed project will cause a permanent loss of habitat within the mussel bed. In addition, turbidity levels, the potential for increased zebra mussel infestation, and sedimentation in the bed may increase as a result of the construction and operation of this project. There is a potential, therefore, for the project to adversely impact endangered mussels either directly (killing mussels) or indirectly (reducing/eliminating reproductive success).

Incidental take will be difficult to detect because C. stegaria represents such a small percentage of the mussel community within the project area. However, based on the assumption that the status of the mussel community within the bed is indicative of the well-being of the subject endangered species, the anticipated level of take is defined as:

1. A decline of up to 25% in the density of the mussel bed after establishing a “before project” baseline. This should include adults and juveniles (juveniles being defined as less than 30 percent of maximum size encountered, measured as total length or animals \leq 3 years old based on external annual ring counts) other than Amblema plicata, which a pollution tolerant species;
2. A decline of up to 25% in the live-to-recently dead ratio of all mussel species. “Recently dead” is defined as those shells exhibiting some shininess of the nacre, which have the ligament or hinge intact or which have some soft tissue remains, or dead less than one year;
3. A decline of up to 25% in the total number of species encountered per bed;

If any or a combination of these criteria are exceeded in the mussel bed, the corps should initiate, with the Service, an evaluation to determine the cause. If evidence suggests that the cause was related to the construction or operation of the mooring facility, reinitiation of consultation will be required.

Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the Act, the Corps must comply with the following terms and conditions. These terms and conditions are non-discretionary.

1. Develop and implement a mussel monitoring plan capable of detecting community structure changes, as defined in the incidental take statement, within the mussel population in the affected bed. The monitoring plan should be developed by a reputable malacologist in coordination with the Service, West Virginia Division of Natural Resources, and the Ohio Department of Natural resources. This would include establishment of a “before project” baseline. Existing data maybe used as appropriate to establish this baseline. After establishment of the baseline, monitoring should continue throughout the life of the project or until it is determined, after consultation and concurrence with the Service, that such monitoring is no longer necessary.
2. Changes discovered in the community structure of the mussel population in the affected bed as a result of the monitoring plan will be compared to the “Level of Take” criteria. Should any of these criteria be exceeded, a reevaluation of the project impacts on the fanshell will be triggered. Reinitiation of consultation may result.
3. Instream construction should be conducted in winter months when mussels are least active (November through March), and during low flow conditions.

4. Once the barge is in fleet, it must be maneuvered within the facility by the use of a winch.
5. Removal of riparian vegetation should be prohibited.

If the Corps determines that the monitoring period required by these terms and conditions exceeds the Corps permit authority, the Corps should: 1) provide the applicant with a copy of this biological opinion; and 2) notify him/her that the terms and conditions must be adopted by the applicant in order for the applicant to be exempt from the provisions of section 9 should incidental take occur. In addition, the applicant should be notified that if these terms and conditions are not implemented, any incidental take that results from the activities considered in the biological opinion would be prohibited by section 9 and, therefore, the applicant should contact this office to apply for an incidental take permit under Section 10(a)(1)(B).

Reinitiation of Formal Consultation

This concludes formal consultation on the action outlined in the Corps' request. As required by 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat is designated that

may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such a take must cease pending reinitiation.

The Service appreciates the opportunity to work with the District in fulfilling our mutual responsibilities under the Endangered Species Act. Please contact Barbara Douglas or William Tolin at or West Virginia Field Office at (304) 636-6586, if you have any questions regarding this matter.

Sincerely,

Jeffrey K. Towner
Field Supervisor

Literature Cited

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cc:

Morrison

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Dinsmore

rider