



**US Army Corps
of Engineers**
Philadelphia District
100 South Independence Mall West
Philadelphia, PA 19106
Attn: CENAP-OPR

Public Notice

Comment Period Begins: April 14, 2023
Comment Period Ends: May 14, 2023
File Number: NAP-2011-00969-85
File Name: DDNREC Mosquito Control SX KE NC
Contact: Michael D. Yost
Email: michael.d.yost@usace.army.mil

This District has received an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344).

The purpose of this notice is to solicit comments and recommendations from the public concerning issuance of a Department of the Army permit for the work described below.

APPLICANT: William H. Meredith of Delaware Mosquito Control Section

AGENT: Paul M. Zarebicki of Delaware Mosquito Control Section

LOCATION: Tidal Wetlands within Sussex, Kent and New Castle Counties

PURPOSE: Control larval mosquito populations

PROJECT DESCRIPTION:

The Delaware Department of Natural Resources and Environmental Control (DNREC), Division of Fish and Wildlife, Mosquito Control Section is seeking a Department of the Army 10 year maintenance permit to continue performing Open Marsh Water Management (OMWM) within the tidal wetlands of Sussex, Kent and New Castle Counties as the primary and preferred mosquito control technique. The most recent Department of the Army permit was issued to the Mosquito Control Section on May 21, 2012.

OMWM provides effective and permanent biological control of larval mosquito populations while significantly reducing the need to apply mosquitocide chemicals. The Delaware Mosquito Control Section has been successfully using OMWM to control mosquitoes in Delaware's tidal marshes since 1979. OMWM will be installed in accordance with specifications presented in the attached, "Guidelines for Open Marsh Water Management in Delaware's Salt Marshes – Objectives, System Designs and Installation Procedures", Meredith et.al 1985. OMWM methodology involves the selective installation of small, shallow ponds and/or inter-connecting ditches superimposed on known mosquito breeding habitats, to manage water conditions on salt marshes to the extent that mosquito breeding habitats are eliminated. Newly created permanent water habitats formed by OMWM ponds and ditches are unattractive for mosquito egg

deposition while simultaneously improving habitats for mosquito eating larvivorous fishes. It should be noted that only mosquito breeding areas of the salt marsh are candidates for OMWM and these areas are generally defined as depressional or "pothole" areas within tidal saltmarshes that have a 5-25 day "wet-dry-wet" cycle. This wet-dry cycle allows adult female mosquitoes to lay eggs on dry mud (an obligatory life cycle) and subsequently become flooded which allows eggs to hatch into the first of five aquatic developmental stages. The principal biological control agent in OMWM systems in Delaware and elsewhere in the Mid-Atlantic is the native saltmarsh killifish or mummichog (*Fundulus heteroclitus*), which naturally quickly invades via tidal flooding, any newly created OMWM pond or ditch. In OMWM systems, scattered mosquito breeding depressions and sheet-water habitats are connected through pond and ditch excavations to allow unimpeded water flow and predatory fish movement, while isolated potholes are often filled with natural marsh soils to eliminate these smaller sized breeding depressions.

The goals of OMWM are as follows: 1) control of saltmarsh mosquitoes, 2) reduce insecticide applications and 3) habitat enhancement for saltmarsh fisheries and wildlife. Efforts made towards achieving these goals must be made in a manner that does not have negative or secondary impacts to other saltmarsh resources. Of particular concern is that OMWM must not alter or adversely affect saltmarsh vegetation communities by significantly lowering subsurface marsh water levels or by depositing any excavated marsh spoil too high.

The type of OMWM system installed is largely determined in consideration of two factors – type of mosquito breeding being addressed and concerns over long-term water quality within the OMWM ponds and ditches. Areas of the salt marsh possessing high densities of individual mosquito breeding potholes are most effectively managed via OMWM systems that make extensive use of infrequently flooded ponds and spur ditches. On the other hand, mosquito breeding found in areas of sheet-water, including large shallow "salt pannes" (large depressions up to a few acres in size with a rather uniform shallow depth of only a few inches) may be best treated with a "sill" outlet that creates a semi-tidal OMWM system, where a small 4"-6" tidal range is created within the OMWM ponds and ditches landward of the sill. This removes ephemeral sheet water from the marsh surface during ebb tides, thereby eliminating mosquito-rearing habitat but not lowering the subsurface water table to the extent that vegetation communities are significantly altered from pre-OMWM conditions.

Water quality concerns also dictate OMWM system designs, since good water quality results in good fish survival, thereby improving mosquito control. Without a healthy predatory fish population, excavated OMWM ponds and ditches can sometimes become mosquito breeding habitats. As such, successful OMWM systems rely upon periodic water renewal to maintain good water quality. In the high marsh, this might be infrequently as a few times per month in conjunction with tidal flooding near times of full or new moons, which mimics what happens in natural ponds and channels found in high marsh areas. This is particularly important during the summer months when high rates of biological decay can lead to low dissolved oxygen levels and other factors can lead to the oxidation of sulfur and formation of sulfuric acid, potentially causing pH as low as 3.0. Both such

conditions can kill saltmarsh fishes and hence diminish good mosquito control. As such, knowledge of local saltmarsh hydrologic conditions, flooding cycles and surface elevations and topography are necessary for designing a functional and productive OMWM system. To this end, OMWM systems found near a medium or high energy tidal source are typically installed as infrequently flooded systems, since tidally borne estuarine water predictably crests the creek banks and floods the saltmarsh at least a few times per month on lunar cycles. It is this flooding that rejuvenates water quality in such OMWM systems. On the other hand, many marshes (or portions of larger marshes) in Delaware are located in areas where even these infrequent tidal exchanges might not occur often enough to maintain good water quality. These tidally limited marshes may be completely natural areas, whereas other tidally limited marshes might be anthropogenically created or altered through road and canal construction or other means of habitat disruption. On marshes where at least some surface flooding cannot be predicted or reliably expected, water quality in OMWM systems can be ensured via installation of the semi-tidal sill outlets. The installed sills allow a limited amount of tidal exchange, while still maintaining a stable baseline water level within the designed system.

The primary mosquito species targets of OMWM are *Ochlerotatus sollicitans*, *Oc. cantator*, *Aedes taeniorhynchus*, *Culex salinarius* and *Anopheles bradleyi*. These species breed on tidal salt marshes and have a conservative flight range of 5-12 miles and as such have the ability to compromise human quality of life and local economies at locations very distant from wetlands. In addition, *Oc. sollicitans* is a primary vector species of Eastern Equine Encephalitis (EEE) – a mosquito-borne disease that fatally affects horses and humans. In addition, *Cx. salinarius* and the *Culex* genera are the primary vectors of West Nile Virus to humans and horses. OMWM is a mosquito control technique that has been successfully used in Delaware since 1979 and is supported as the ideal means of mosquito control by the Delaware Coastal Management Plan.

MITIGATION

The applicant has stated that the proposed project has been designed to avoid and minimize adverse effects on the aquatic environment to the maximum extent practicable. Information provided in the application and on the plans indicates that compensatory mitigation is neither practicable nor feasible for the amount of dredged or fill material to be discharged into waters of the United States.

The OMWM program proposed by the Mosquito Control Section, and the marsh management activities described in this public notice, cannot be avoided entirely because they are, by their nature, water-dependent activities. It should be noted that mosquito control in Delaware is a public health concern, and absent the proposed open marsh water management, the Mosquito Control Section would not be able to achieve its statutory requirement of controlling populations of harmful tidal-marsh mosquitoes. However, the applicant has developed the OMWM program to meet its obligation to the people of Delaware while also ensuring the minimization of impacts to tidal wetlands and the habitats found there. The OMWM program has been in use for over 40 years with a general record of success. The direct impacts associated with OMWM techniques

are mostly temporary in nature; the long-term effects being to generally improve the habitat value and diversity of the affected marsh. As stated above, the technique utilizes the forces of nature to achieve its objectives while eliminating the application of chemical insecticides on the treated marshes. Most of the marshes to be treated were grid-ditched in the past and so their vegetation and hydrology have been substantially altered. Although OMWM techniques temporarily impact relatively small areas of vegetation at each treatment site, those impacts have been shown to be only temporary, the vegetation fully recovering within two seasons. Besides the reduction of mosquito breeding, the benefits to the treated marshes include: increased fisheries feeding and spawning habitat, increased feeding, nesting and resting sites for marsh-birds, shorebirds and waterfowl and decreased growth of invasive exotic plants. Because no wetlands or other special aquatic sites would be permanently and negatively impacted by the project, the applicant is not proposing to conduct any compensatory mitigation for the mosquito control work.

CORPS EVALUATION FACTORS

The decision whether to issue a permit will be based on an evaluation of the activity's probable impact including its cumulative impacts on the public interest. The decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the work must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the work will be considered including the cumulative effects thereof. Among these factors are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs and welfare of the people.

The evaluation of the impact of this project will also include application of the Clean Water Act Section 404(b)(1) Guidelines promulgated by the Administrator, U.S. Environmental Protection Agency if the project includes a discharge of dredge or fill material pursuant to Section 404 of the Clean Water Act.

ENDANGERED SPECIES

A preliminary review of this application indicates that species and/or their critical habitat pursuant to Section 7 of the Endangered Species Act (ESA) may be present in the action area. This office will forward this Public Notice to the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) with a request for technical assistance on whether any ESA-listed species or their critical habitat may be present in the area which would be affected by the proposed activity. This office will evaluate the potential effects of the proposed actions on ESA-listed species or their critical habitat and will consult with the USFWS and/or NMFS, as appropriate. ESA Section 7 consultation would be concluded prior to the final decision on this permit application.

CULTURAL RESOURCES AND TRIBAL TRUST

The District's Cultural Resource Specialist and Tribal Liaison is currently reviewing the proposed permit action for potential impacts to Historic Properties eligible for or listed on the National Register of Historic Places and for potential issues concerning the Tribes. A determination of effects will be coordinated with the State Historic Preservation Office, the Tribes and other consulting parties as necessary.

ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires all federal agencies to consult with the National Marine Fisheries Service (NMFS) for all actions, or proposed actions, permitted, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH). A preliminary review of this application indicates that EFH is present within the project area. This office will evaluate the potential effects of the proposed actions on EFH and will consult with NMFS, as appropriate. Consultation would be concluded prior to the final decision on this permit application.

WATER QUALITY CERTIFICATE

In accordance with Section 401 of the Clean Water Act, a Water Quality Certificate (WQC) is required from the State government in which the work is located. Any comments concerning the work described above which relate to Water Quality considerations should be sent to this office with a copy to the State.

COASTAL ZONE MANAGEMENT ACT

In accordance with Section 307(c) of the Coastal Zone Management Act of 1972, applicants for Federal Licenses or Permits to conduct an activity affecting land or water uses in a State's coastal zone must provide certification that the activity complies with the State's Coastal Zone Management (CZM) Program. The applicant has stated that the proposed activity complies with and will be conducted in a manner that is consistent with the approved State CZM Program. No permit will be issued until the State has concurred with the applicant's certification or has waived its right to do so. Comments concerning the impact on the State's coastal zone should be sent to this office with a copy to the State's CZM office.

SUBMISSION OF COMMENTS AND PUBLIC HEARING REQUEST

Any comments received will be considered by this office to determine whether to issue, modify, condition, or deny a permit for this proposed project. To make this decision, comments are used to assess the probable impact on the public interest. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Comments on the proposed work must be submitted, in writing, within the comment period indicated in the header above. Any person may request, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for a public hearing must be in writing and state the reasons for holding a public hearing.

Please provide any comments, request for a public hearing, or requests for additional information to the Regulatory Project Manager indicated above. All Public Notices are posted on our website at:

<https://www.nap.usace.army.mil/Missions/Regulatory/Public-Notices/>

A handwritten signature in black ink, reading "Todd A. Schaible", is written over a circular official seal. The seal is partially obscured by the signature and contains some illegible text and a central emblem.

FOR: Todd A. Schaible
Chief, Regulatory Branch