

SECTION 3.3

MITIGATION REQUIREMENTS FOR DRAINAGE IMPROVEMENT PROJECTS

Drainage improvement projects may sometimes include activities that can potentially have an unwanted negative impact on the environment. These impacts include disturbing the pools and riffles, trees, and other types of habitat established in the low flow channel, on the banks, or on the overbanks area along a stream or ditch. Occasionally, these projects may also impact wetlands or other aquatic resources adjacent to the project site. Regulating agencies frequently require compensatory mitigation when an unreasonably detrimental environmental impact occurs or is likely to occur as a result of project implementation. Some of these agencies, such as the COE, have established detailed procedures for determining the need for mitigation measures and the process involved. Others, such as the IDNR, may require these mitigation measures in the form of "Special Conditions" when they issue their permits. Despite these differences in the approach, all agencies basically agree on a planning approach which would minimize the need for mitigation measures. This planning approach will be described later in this section.

Due to site-specific nature of mitigation, it is difficult to elaborate on mitigation requirements for each type of activity. However, by explaining the issues involved and clarifying the agencies' positions, it is hoped that the drainage improvement activities may be planned with mitigation as a component. The following material has been prepared based upon a review of current available information regarding the various local, Federal and State regulations, rules, guidelines, and policy documents pertaining to drainage improvement activities. Further information regarding this subject may be found by directly contacting these regulating agencies. One good source of information regarding wetland mitigation is the "South Carolina's Developer's Handbook for Freshwater Wetlands". The IDNR has also drafted informational bulletins regarding wetlands and habitat mitigation. Pertinent material and text from the above-noted publications have been extensively utilized in the preparation of the material presented in this section.

3.31 Definition

"Mitigation" is defined as taking special action to eliminate, lessen, or replace environmental values where those values are disturbed by human activities. The Federal and State regulatory programs affecting the drainage improvement projects in Indiana involve the mitigation of harmful effects of necessary drainage improvement activities on wetlands and other aquatic resources as well as on botanical resources and wildlife habitat. These permit programs rely on a sequential approach to mitigate these harmful effects by first **avoiding** unnecessary impacts, then **minimizing** environmental harm, and finally, **compensating** for remaining unavoidable damage to wetland and other aquatic, botanical, or wildlife resources/habitat. Restoration, preservation, and creation of wetlands or replacement of trees are examples of compensation. Best Management Practices for several typical compensating measures that are usually called for by the agencies when such measures are deemed necessary, are provided in Section 5 of this handbook.

A mitigation procedure may be accomplished by various methods. The procedure is often defined in terms of a ratio of units replaced to units altered. As an example, if three (3) acres are required to be replaced or reconstructed for one (1) acre adversely impacted or destroyed, then this mitigation will be described as a ratio of 3:1. The higher the environmental value of the habitat being impacted, the higher the mitigation ratio required. Factors such as proximity of the

compensation area to the project area, presence or likely presence of listed Federal or State species, cumulative effects, quality of riparian corridor, community structure and composition, and species diversity, greatly influence the magnitude of the mitigation ratio.

Mitigation ratios required by regulating agencies for wetlands and habitat are frequently greater than 1:1 for several reasons. There is typically a long-term loss of benefits and functions of the impacted resources before a constructed or reconstructed area is fully developed. There is also the risk that the benefits and functions of the original area may not be fully replaced by the mitigation effort. There is a loss of production when a habitat is destroyed, and this production may never be equalled by the replacement area.

3.32 Planning Approach

Compensatory mitigation for disturbances to natural resources is the final alternative which should be considered when a project is planned. The sequence to follow during project planning is (1) identification; (2) avoidance of disturbance; (3) minimization of disturbance; and (4) where avoidance and minimization of disturbances do not dispose of the issue, compensation for any remaining unreasonably detrimental impacts on natural resources. The noted sequence is clearly recognized and prescribed by the Clean Water Act Section 404(b)(1) Guidelines. State regulating agencies, i.e., IDNR and IDEM, have also adopted and required similar procedures. The following is a brief description of the noted sequential steps:

Identification

As a part of the project planning efforts and prior to project design and implementation, a site assessment must be performed to identify the size, type, and location of resources existing on or near the project site. This identification stage should include a review of wetland inventory maps, soil maps, and other available data regarding riparian resources. The presence or absence of other important resources such as endangered species or important cultural resources should also be identified at this stage.

As the planning process continues, this early assessment should be developed into more detailed and certain information. Examples of such detailed information include delineating wetlands or listing and quantifying other aquatic, botanical, and wildlife resources/habitat impacted by the proposed projects. Without first identifying the potentially impacted resources, it is impossible to properly follow the logical sequence of avoiding, minimizing, and compensating prescribed by the regulating agencies. A brief description of the identification process is provided in Section 5.1 as "Practice 101: Site Assessment".

Avoidance

In developing drainage improvement plans for an area containing valuable botanical resources, fish, or wildlife habitat as well as aquatic resources, such as wetlands, every effort should be made to avoid encroachments into these areas. As required under the 404(b)(1) Guidelines, impacts to aquatic resources which can be avoided must be avoided.

Minimization

If the wetlands or habitat areas located within the project limits cannot be totally avoided, then every effort must be made to minimize encroachments into these areas. Early planning is the key to minimizing impacts on the aquatic, botanic, and wildlife resources. Minimization can be attained in a number of ways but is generally considered to have occurred when the disturbances to the sensitive habitat and resources are held to the minimum necessary to achieve the basic purpose. Examples of minimization include, but are not limited to, the following:

- One-side construction to limit the disturbances to only one side of channel so that some habitat is maintained along the stream reach.
- Marking and preserving trees that do not significantly interfere with the project construction and maintenance.
- Limiting the access points to the stream or ditch to the minimum number possible. Sometimes this can be achieved through accessing the streambank on the inside bend of a meander.
- Obtaining access to the project area through wetlands only where upland access is unavailable.
- Bridging wetlands to the maximum extent practicable taking into consideration cost, logistics, and existing technologies.
- Providing steeper side slopes for access fills (within applicable safety requirements).
- Planning a single access road through wetlands rather than multiple accesses requiring fill or fragmenting aquatic areas or habitat.

Minimization of project encroachments into wetlands or valuable habitat areas can significantly shorten the time required to obtain authorization for the project under the Flood Control Act administered by the IDNR and Nationwide Permits or Individual Permits administered by COE.

Mitigation (Compensatory Mitigation)

If more than negligible adverse impacts (an unreasonably detrimental effect, as defined in the Indiana Flood Control Act.) to the fish, wildlife, and botanical resources/environment remain after appropriate measures have been incorporated to avoid and minimize the adverse impacts, then compensatory mitigation will normally be required. Compensatory mitigation means compensating for the adverse effects by replacing or providing substitute resources or environments. Categories of compensatory mitigation for ecological effects include creation, restoration, enhancement, and, in certain cases, preservation.

Creation: In designing creation mitigation, care must be taken to avoid the selection of high quality upland habitat for conversion. For example, a cut-over area or former agricultural field would be ecologically preferable to a mature forested area as a candidate for alteration. Mature forested areas will generally not be approved as suitable creation areas. Creation of wetlands in non-hydric soils is most often a difficult task. Before proposing this form of compensation, please seek expert guidance. Included within this category are the replacement of trees and brush, as appropriate.

Restoration or Enhancement: For example, filling drainage ditches to allow adjacent hydric soils to return to a natural, functional wetland system. Other examples include creating artificial pools, riffles, and/or shady spots in natural streams to enhance the fish habitat in one reach of a stream as a means of compensating unavoidable losses to other stream reaches.

Preservation: For example, dedication of ecologically significant lands to an appropriate trust entity with provisions that require them to be preserved in their natural state in perpetuity.

A willingness to compensate for wetland and habitat impacts does not necessarily mean that permit will be granted by the regulating agencies. The applicant must demonstrate that all reasonable and practicable efforts have already been made to avoid and minimize wetland and habitat encroachments. Compensation is only the last resort.

3.33 Appropriate Measures

Mitigation requirements for unreasonably detrimental environmental impacts of drainage improvement activities should be determined on a case by case basis. As indicated earlier in Section 3.2, the quality of habitat found along different classes of open drains varies significantly. Although authorization from various agencies may be required regardless of the type of drainageway, the degree of oversight and the requirement for mitigation measures (if any) will likely vary based on the drain classification.

The state and federal agencies, which regulate activities associated with streams, ditches, wetlands, and other bodies of water in Indiana, do not have a documented system for classifying streams or drains. However, most agencies recognize that practical differences exist in the environmental sensitivity of streams and the mitigation requirements associated with their disturbance. These differences are generally based upon the pre-construction conditions of the stream, whether it has been extensively modified in the past, and its importance and quality as a riparian corridor. To aid the users in understanding the differences that exist between various drainageways and for the purpose of this handbook, they have been divided into Closed Tile Drains, Man-Made Open Ditches, and Natural Streams (with or without modifications).

Closed Tile Drains include subsurface pipes made of burned clay concrete, polyvinyl chloride (PVC) or similar materials of various lengths, laid to collect and carry excess water from fields.

Man-made Open Ditches are characterized by long, fairly straight stretches with uniform side slopes, depth, and bottom width with fairly uniform grade. In many cases, these drains are dry or have no flow of water during times of low rainfall. With few exceptions, most of these types of drains are designated as "Regulated Drain" under the Indiana Drainage Code and are maintained or debrushed regularly. Exhibit 3.3a shows a typical man-made open ditch.



Exhibit 3.3a: Typical Example of a Man-Made Ditch with Grass Lining (Source: IDNR Files)

Natural Streams are characterized with natural meanders that follow historic drainage patterns. They often are associated with naturally occurring riparian habitat of brush or woody vegetation, and significant areas of deeper pools suitable for fish and aquatic animals. Natural streams have multiple uses and serve purposes well beyond mere accommodation for drainage. However, some segments of natural streams may have been modified at some time to increase capacity to carry stormwater or designated as "Regulated Drains". These modifications may have included channel straightening, deepening, and reshaping channel banks. In addition, brush and trees may have been removed from one or both banks. Exhibit 3.3b shows a typical natural stream.



Exhibit 3.3b: Typical Example of a Natural Stream (Source: Ohio Stream Management Guide)

As described earlier, compensatory measures for the mitigation of unreasonably detrimental environmental impacts may be achieved in different ways. Several of these methods are described as standard practices later in this handbook. However, not all methods are appropriate for every situation. For example, the replacement of trees within the easement of a regulated, man-made ditch may not be appropriate because these areas are subject to regular debrushing as required for maintaining the functionality of the drain for the purpose it was constructed.

The type of the required mitigating measures and the magnitude of replacement ratios should be appropriate for the purpose and nature (i.e., man-made versus natural) of the drain as well as the environmental benefit of the habitat areas associated with them. Therefore, **it is essential that adequate information regarding the existing habitat and resources within the project area is developed by the applicant (through the sequential approach noted earlier) and be made available so that objective, case by case determination of the mitigation requirements may be made by the regulating agencies.**