

## Clearinghouse Rule 06-126

### ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD CREATING RULES

The Wisconsin Natural Resources Board proposes an order to create NR 328, subch. III relating to bank erosion control on rivers and streams.

WT-36-06

#### Summary Prepared by the Department of Natural Resources

Statutory Authority: ss. 30.12(1), and (3)(br), 30.2035, 30.206 and 227.11(2), Stats.

Statutes Interpreted: ss. 30.12(1), (3) and (3m), and 30.206, Stats.

#### Explanation of Agency Authority:

The Department has authority under ss. 30.12 and 30.206, Stats., to promulgate rules to establish general permits.

#### Related statute or rule:

These rules relate directly to regulation of activities in navigable waters under ch. 30, Stats., and the NR 300 series of rules.

#### Plain Language Analysis:

The purpose of this rule is to establish general permits with appropriate conditions, and to establish standards for projects that may be authorized under an individual permit.

Standards for general permits and individual permits in this section are based on state-of-the-art science for determining erosion potential at a site that corresponds to the presence of habitat features (and coincidentally the potential for shore erosion at the site). Research shows that fish and wildlife habitat is maximized along natural shorelines and minimized where seawalls and riprap is installed. Where habitat is impaired due to severe streambank erosion or sedimentation, shore erosion control structures can improve habitat.

This order also establishes general permits for biostabilization, integrated bank treatment, and seawall replacement. Biostabilization is allowed at most locations outside of forested areas of the state. Integrated bank treatment is allowed at locations outside of forested areas that have a specified level of erosion potential.

This order also establishes considerations for individual permits.

Federal Regulatory Analysis: Any activity that results in a discharge (including deposits and structures) into "waters of the United States" is regulated by the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act. An Individual Permit from the Corps is required, unless Wisconsin regulates the project in its entirety under chapter 30, Stats., in which case the project is authorized by the Corps under general permits GP-01-WI or GP-LOP-WI. Dredging or discharge into waters declared navigable under Section 10, Rivers and Harbors Act, 1899 is also regulated, and requires an Individual Permit from the Corps.

Comparison with Adjacent States:

**Minnesota**

The Minnesota Department of Natural Resources, Division of Waters is responsible for Administrative Rules 6115.0215 (Restoration of Public Waters) and 6115.0210 (Structures in Public Waters). Minnesota's regulations include exempted activities and general permits and the regulated activity are roughly similar to Wisconsin. Minnesota's stated resource protection goals are more protective than Wisconsin, however their Administrative Rule criteria are more subjective.

**Michigan**

Inland lakes and streams are regulated under Part 301 and of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended. Under Part 301 the construction of any type of shore stabilization structure such as a sea wall, bulkhead, revetment, etc. at or below the ordinary high water mark of the lake or stream requires a permit. Michigan's stated goals and procedures (except MI has no erosion control structures exempt from permits) are similar to Wisconsin, however their specific decision criteria are more subjective.

**Illinois**

Illinois has no firm detailed guidelines related to specific permitting of erosion control structures. The U.S. Army Corps of Engineers often plays the lead role in permit issuance of erosion control structures in Illinois. The Army Corps consults with Illinois DNR, Illinois EPA and the U.S. Fish and Wildlife Service when reviewing projects. Project reviews typically focus on water quality and endangered resources. Illinois' regulation of erosion control activities is less protective of habitat than in Wisconsin, and their decision criteria more subjective.

**Iowa**

Pursuant to Chapter 461A, erosion control structures placed below the ordinary high water mark require a permit for rivers, streams and lakes under the jurisdiction of the DNR (Sovereign Lands Construction Permit). Iowa Administrative Code only identifies authority, and the Department offers limited guidance and historical precedence for conducting project reviews. Environmental reviews consist of a record of review for protected species (state listed endangered or threatened), rare natural communities, state lands and waters in the project area, including review by personnel representing state parks, preserves, recreation areas, wetlands, fisheries and wildlife. Iowa's regulation of erosion control activities is less protective of habitat than in Wisconsin decision criteria more subjective.

Summary of Factual Data and Analytical Methodologies: Standards are based on: state-of-the-art science for determining bank erosion potential at a site that corresponds to the presence of habitat features, and the potential for bank erosion at the site; State of Wisconsin baseline monitoring data and corroborating scientific research that differentiate between stream habitat types and occurrence of bank erosion corresponding to ecological regions.

Analysis and Documents Supporting Determination of Small Business Effect: Any person placing a structure or making similar physical modifications to public navigable waters either qualifies for an exemption or must obtain a general or individual permit under state statute. To comply, small businesses follow the same requirements as other waterfront property owners: (1) make a self-determination of exemption using web-based tools provided by the department or describe their activity on an exemption determination request form; (2) complete a general permit application; or (3) complete an individual permit application. Schedules, application steps and compliance/reporting requirements are very basic for all applicants, and most projects can be planned and conducted by individuals with no specific professional background.

Anticipated Private Sector Costs: No significant fiscal effect on the private sector is anticipated.

Effect on Small Business: Small businesses who wish to conduct regulated activities on or near navigable waterways will be affected by the rule. Specific standards will provide clarity and consistency in the permitting process.

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Deadline for written comments: The deadline for written comments is January 5, 2007. Written comments may be submitted to Mr. Paul Cunningham, Bureau of Watershed Management, P.O. Box 7921, Madison, WI 53707, or may be submitted electronically at the following Internet site: <http://adminrules.wisconsin.gov>.

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SECTION 1. Chapter NR 328 (title) is repealed and recreated to read:

**CHAPTER NR 328  
SHORE EROSION CONTROL STRUCTURES IN NAVIGABLE WATERWAYS**

SECTION 2. Chapter NR 328, subch. III is created to read:

**SUBCHAPTER III  
SHORE EROSION CONTROL STRUCTURES ON RIVERS AND STREAMS**

**NR 328.31 Purpose.** (1) The purpose of this subchapter is to establish reasonable procedures and limitations for general permits and individual permits for placement of shore erosion control structures in rivers and streams as regulated under s. 30.12, Stats., in order to protect the public rights and interest in the navigable, public waters of the state as defined in s. 30.10, Stats.

(2) The standards for general permits and individual permits in this chapter balance the reasonable right of riparians to control shore erosion under Wisconsin law with the public rights to navigation, recreation, fish and wildlife habitat, water quality and natural scenic beauty in navigable waters. (Doemel v. Jantz, 180 Wis. 225, 193 N.W., 393 (1923)).

(3) The standard for general permits recognizes that stream channels naturally move back and forth across their floodplains as the energy of water current is dissipated against the stream banks. Watershed land cover, reflecting rainfall infiltration and soil type, predicts the nature of in-stream habitat features as well as the extent of stream channel movement.

(4) This subchapter establishes differing choices of the types of general permits available based on ecoregion and land-use principles. Streams in predominantly forested watersheds have a high percent of natural shore vegetation, including wetlands and large woody cover. Streams of the Northern Lakes and Forests and the North Central Hardwood Ecoregions are environmentally healthy in comparison to other ecoregions that contain more agricultural and urban land use. Streams in predominantly forested watersheds also exhibit seasonally stable flows. Conversely, streams in agriculturally dominant watersheds exhibit more frequent and larger flooding events. These higher flows create severe bank erosion problems. Eroding banks deliver large amounts of sediment and impair instream habitat. Streams in predominantly urban watersheds are frequently confined by man-made structures, residences, and industries that cannot be moved. This subchapter establishes a broader array of general permits available for streams in agricultural or urban dominant watersheds.

(5) This subchapter authorizes bank erosion control treatments based on erosive potential at a site within the stream. Erosive potential is a reflection of habitat features at a site. Natural shoreline features provide natural erosion control in various ways. The force of current sorts out sand, gravel, cobbles, boulders and bedrock from beneath glacial till and other fine soils. These more energy resistant materials form energy-absorbing barriers that eliminate, or slow, erosion. Natural vegetation provides erosion control in several ways. Plant roots form a matrix that holds soil particles together to stabilize banks. Exposed stalks, stems, branches, foliage and fallen trees dampen waves, reduce local flow velocities, and dissipate energy against the plant rather than eroding the soil. Low-erosion potential sites are often typified by abundant natural vegetation, gradually sloped banks, gravel/rubble/boulder substrates at the toe of the bank, and no stratified soil layers. At low erosion potential and some moderate erosion potential sites,

vegetation can effectively meet erosion control needs without infringement on habitat, navigation, natural scenic beauty or other public interests. Vegetation alone may be inadequate in some moderate erosion potential sites and many high erosion potential sites; therefore, methods that rely on technical structures or a combination of vegetation with technical structures, i.e., large substrates, may be necessary. Re-vegetated, topsoil-covered riprap and integrated bank protection are preferred structural bank protection methods in high-erosive potential settings.

**(6)** Standards for general permits are intended to ensure that cumulative adverse environmental impact of authorized activities is insignificant and that issuance of the general permit will not injure public rights or interests, cause environmental pollution as defined in s. 299.01(4), Stats., or result in material injury to the rights of any riparian owner. To achieve this, general permit standards establish: construction and design requirements consistent with the purpose of the activity; location requirements that ensure that the activity will not have an adverse impact on fish and wildlife habitat, water quality and natural scenic beauty, or materially interfere with navigation or have an adverse impact on the riparian property rights of adjacent riparian owners.

**(7)** Factors for individual permits are intended to provide direction for detailed evaluation of permit applications, and to balance case-by-case review with consistent decision-making. Individual permits may only be granted where the department determines that the structure will not materially obstruct navigation, will not be detrimental to the public interest, and will not materially reduce the flood flow capacity of a stream.

**NR 328.32 Applicability.** **(1)** Except as provided in s. 30.2023, Stats., this subchapter applies to construction, placement and maintenance of bank erosion control structures regulated under s. 30.12(1), (1g)(a), and (k), (2m), 3r. and 13. and (3m), Stats. Any person that intends to construct, place or maintain a bank erosion control structure in any river or stream shall comply with all applicable provisions of this chapter and any permit issued under this chapter.

**(2)** Erosion control measures such as grading to establish a stable slope, revegetation or other bioengineering methods that do not involve the placement of structures on the bed of a waterway or disturbance of more than 10,000 square feet on the bank are not regulated under s. 30.12 or 30.19, Stats., or this subchapter.

**Note:** A permit is required if land disturbance or excavation exceeds 10,000 square feet on the bank of the navigable waterway (s. 30.19, Stats., and ch. NR 341) or if the activity is conducted in a wetland (ss. 281.17 and 281.36, Stats.). Erosion control activities may be subject to county, city or village ordinances.

**Note:** Bank erosion control structures solely located above the ordinary high water mark are likely to migrate below the OHWM as the energy of water current is dissipated against the toe of the stream bank. When this migration occurs, the bank erosion control structure is considered subject to the provisions of this chapter.

**NR 328.33 Definitions.** In this subchapter:

**(1)** “Bank erosion control structure” means a structure with defined shape, size, form and utility constructed and maintained for the purpose of protecting a streambank from erosion.

**(2)** “Biological materials” means living or organic materials that are biodegradable such as native grasses, sedges, forbs, shrubs and trees; live stakes and posts; non-treated wood; jute netting; fiber rolls and mats; logs; and branches.

**Note:** Temporary breakwaters, with non-biodegradable elements, are considered a permissible element during the plant establishment phase of a biological erosion control project.

**(3)** “Biostabilization” means a structure that relies solely on biological materials and may include bank reshaping. Biological bank erosion control structures include but are not limited to native vegetation, fiber rolls, fiber mats, live stakes, brush mattresses, fascines, branch packing, brush layering, encapsulated soil lifts, or revegetation by seeding.

(4) "Commercial marina" has the meaning in ch. NR 326.

(5) "Department" means the department of natural resources.

(6) "Grading" means the physical disturbance of the bank by the addition, removal or redistribution of soil.

(7) "Inert materials" means those materials that slowly degrade, such as chemically treated wood, stone, stainless and galvanized steel, plastics and synthetic polymers.

(8) "Integrated bank treatment" means a structure that combines 2 separate treatments: structural treatment for toe protection at the base of the bank and biostabilization on the remaining upper portion of the bank. Biostabilization may also be incorporated as part of the toe protection.

(9) "Municipal marina" has the meaning in ch. NR 326.

(10) "Ordinary high water mark" means the point on the bank or shore up to which the presence and action of water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation or other easily recognizable characteristic.

(11) "Navigable waterway" means any body of water with a defined bed and bank, which is navigable under the laws of the state. In Wisconsin, a navigable body of water is capable of floating the lightest boat or skiff used for recreation or any other purpose on a regularly recurring basis.

**Note:** This incorporates the definition at s. 30.01(4m), Stats., and current case law, which requires a watercourse to have a bed and banks, *Hoyt v. City of Hudson*, 27 Wis. 656 (1871), and requires a navigable waterway to float on a regularly recurring basis the lightest boat or skiff, *DeGayner & Co., Inc. v. DNR*, 70 Wis. 2d 936 (1975); *Village of Menomonee Falls v. DNR*, 140 Wis. 2d 579 (Ct. App. 1987).

(12) "Replacement" means a degree of structural changes to the bank erosion control structure by which some or all of the structure is removed and recreated.

**Note:** For seawalls, any replacement of a portion of the seawall down to or at the footing of the structure is considered replacement. For riprap, replacement of filter fabric or replacement of the base substrate is considered replacement.

(13) "Riparian" means an owner of land abutting a navigable waterway.

(14) "Riprap" means a layer or layers of rock, including filter material, placed on the bed and bank of a navigable waterway to prevent erosion, scour or sloughing of the existing bank.

(15) "Seawall" means an upright structure that is steeper than 1.5 feet vertical to one foot horizontal and that is installed parallel to the bank to prevent the sliding or slumping of the land and to protect the adjacent upland from the action of surface water.

**Note:** Seawalls are commonly constructed of timber, rock (including gabions), concrete, steel or aluminum sheet piling, and may incorporate biological components. Biostabilization structures steeper than 1.5 feet vertical to one foot horizontal, such as encapsulated soil-lifts are not considered seawalls.

(16) "Structural treatments" means a bank erosion control structure that relies solely on inert materials and includes but is not limited to riprap, reno mattresses (slabs of rock encapsulated in gabion baskets, laid on a slope) tree revetments, rootwads, dormant posts, and seawalls.

(17) "Toe" means the most waterward edge of a shore erosion control structure.

**(18)** “Wetland” means an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions.

**Note:** Common law doctrine of avulsion secures to waterfront property owner the ability to reclaim land suddenly lost to erosion (*AG ex rel Becker v. Bay Boom Wild River and Fur Company*, 172 Wis. 363 (1920)).

**NR 328.34 Pre-existing structures.** A streambank erosion control structure which is authorized by an existing department permit shall continue to be authorized, provided the structure is maintained in compliance with all the conditions of the original permit. Any modifications to the structure that do not comply with the original permit conditions shall require a new permit and shall comply with all standards in this section.

**NR 328.35 General permits. (1) PROCEDURES.** General permits shall be processed according to the procedures in ch. NR 310.

**(2) APPLICABLE ACTIVITIES.** Projects that meet all the criteria in sub. (3) and either sub. (4), (5), or (6) are eligible for general permit coverage under ss. 30.12(3)(br) and 30.206, Stats.

**(3) GENERAL STANDARDS. (a)** If the department determines that a proposal submitted under this section has the potential to impact an endangered or threatened species in accordance with s. 29.604, Stats., the application shall be deemed incomplete. The department may not consider the application complete or issue a general permit until the applicant submits documentation to demonstrate one of the following:

1. The project avoids impacts to the endangered or threatened species in accordance with s. 29.604, Stats.

2. The project has received an incidental take authorization under s. 29.604, Stats.

**(b)** If the applicant modifies the project plans to meet the requirements of par. (a), the modified plans shall be submitted before the department may consider the application complete or issue a general permit.

**(c)** The structure may not be placed in a wetland.

**Note:** Eligibility for a general permit does not automatically result in a federal permit or state water quality certification for fill in wetlands. Some projects involving minimal wetland fill may be eligible for authorization under a U.S. Army Corps of Engineers general permit which has already been granted state water quality certification [see non-reporting and 404 GP activities in the table at <http://www.mvp.usace.army.mil/docs/regulatory/WIMATRIX.htm>] or a general permit under s. 281.36(8), Stats. (under development) All other projects affecting wetlands will require individual water quality certification including public notice as required by s. 401, Federal Clean Water Act, and s. 281.36(2), Stats., and carried out under chs. NR 103 and 299. For further instructions, see the department’s website at [www.dnr.wi.gov](http://www.dnr.wi.gov) under the topic “Waterway and Wetland Permits.”

**(d)** Structures may be placed only by a riparian.

**(e)** To minimize adverse impacts on fish movement, fish spawning, egg incubation periods and high stream flows, placement may not occur during the following time periods:

1. For trout streams identified under s. NR 1.02(7) and perennial tributaries to those trout streams, September 15 through May 15.

2. For all waters not identified in subd. 1. and located south of state highway 29, March 15 through May 15.

3. For all waters not identified in subd. 1. and located north of state highway 29, April 1 through June 1.

4. The applicant may request that the requirement in subd. 1., 2., or 3. be waived by the department on a case-by-case basis, by submitting a written statement signed by the local department fisheries biologist, documenting consultation about the proposed shore erosion control project, and that the local department fisheries biologist has determined that the requirements of this paragraph are not necessary to protect fish spawning for the proposed project.

(f) Any grading, excavation and land disturbance shall be confined to the minimum necessary for the construction and may not exceed 10,000 square feet.

**Note:** A permit is required under s. 30.19, Stats., and ch. NR 341 if land disturbance or excavation exceeds 10,000 square feet on the bank of the navigable waterway. Bank shaping activities necessary to protect stream and river shorelines from erosion on lands used entirely for agriculture are exempt from this subchapter.

(g) Erosion control measures shall meet or exceed the technical standards for erosion control approved by the department under subch. V of ch. NR 151. Any area where topsoil is exposed during construction shall be immediately sodded, seeded and mulched, covered with erosion mat or ripped to stabilize disturbed areas and prevent soils from being eroded and washed into the waterway.

**Note:** These standards can be found at the following website:  
<http://dnr.wi.gov/org/water/wm/nps/stormwater/techstds.htm>

(h) Unless part of a permanent stormwater management system, all temporary erosion and sediment control practices shall be removed upon final site stabilization. Areas disturbed during construction or installation shall be restored.

(i) Vegetation, such as seeding and dormant plantings, shall be plant species native to the area of Wisconsin where the project is located. Non-invasive cool season species such as Virginia wild rye, Timothy, alfalfa, alsike clover, orchard grass, Smooth brome grass and red top, may be incorporated into native seed mixes for the purpose of rapid stabilization of critical sites adjacent to agricultural fields.

(j) All equipment used for the project shall be designed and properly sized to minimize the amount of sediment that can escape into the water.

(k) The stabilization method shall follow the natural contour of the shoreline. No waterward extension of the property is permitted other than what is reasonably necessary to conduct the project and protect the existing bank. Except as provided in sub. (4)(d), no soil or similar fill material may be placed in a wetland or below the ordinary high water mark of any navigable waterway.

(L) Erosion control structures shall begin and end at a stabilized or controlled point.

(m) Except as required for appropriate toe installation of the erosion control structure, dredging is not permitted under this section.

(n) The erosion control structure design and placement may not result in a net decrease in the density or size-structure of tree-falls or logs in the water or on the bed and banks of the stream.

(o) Except for the Driftless and Prairie Pothole Ecoregions, all trees greater than 4" DBH (diameter breast high) removed as part of the erosion control project within 35 feet of the ordinary high water mark shall be incorporated into the waterward portion of the erosion control design.

(p) The stabilization practices shall be maintained in good condition.

**(4) BIOSTABILIZATION.** Biostabilization on the bed or bank of a navigable river or stream may be authorized under this general permit if it meets the requirements of sub. (3) and all of the following requirements:

(a) The project site is not located on a federal or state (under ss. 30.26 and 30.27, Stats.), designated wild or scenic river.

(b) The project site is located in the Driftless and Prairie Pothole Ecoregions, or Southeastern Till and Cornbelt Plains Ecoregions, or is located in an urban watershed as identified in s. NR 328.38, or is within village or city limits.

(c) Structural stabilization practices shall be sloped to 1.5 horizontal to one foot vertical or flatter. Banks treated only with vegetation shall be sloped to 2 foot horizontal to one foot vertical or flatter.

(d) The placement of soil below the ordinary high water mark is limited to topdressing for the establishment biological materials.

(e) Except as provided in sub. (3)(i), revegetation shall follow practice standards found in Wisconsin Biology Technical Note #1: Shoreland Habitat, found at <ftp://ftp-fc.sc.egov.usda.gov/WI/technotes/biology-tn1.pdf>

**(5) INTEGRATED BANK TREATMENT.** Integrated bank treatment on the bed or bank of a navigable river or stream may be authorized under this general permit if it meets the requirements of sub. (3) and all of the following requirements and limitations:

(a) The project site is located in the Driftless and Prairie Pothole Ecoregions, or Southeastern Till and Cornbelt Plains Ecoregions, or is located in an urban watershed as identified in NR328.38, or is within village or city limits.

Note: Village or city boundaries are identified according to Tiger 2000 Census.

(b) The project site has a Bank Erosion Potential Index (BEPI) of 20 or greater as determined by the method in 328.38.

(c) The project site is not located on federal or state (under ss. 30.26 and 30.27, Stats.), designated wild or scenic river.

(d) Stone associated with toe protection shall be clean field stone or quarry stone appropriately sized according to the USDA, NRCS Wisconsin Supplement to the Engineering Field Handbook Chapter 16 - Streambank and Shoreline Protection.

**Note:** These standards can be found at the following website: <ftp://ftp-fc.sc.egov.usda.gov/WI/efh/efh-chapter16.pdf>

(e) Toe protection materials may not be placed above the ordinary high water mark elevation plus one foot in the Southeastern Till and Cornbelt Plains Ecoregions. Toe protection materials may not be placed above the ordinary high water mark elevation plus 2 feet in the Driftless and Prairie Pothole Ecoregions, or a predominantly urban watershed.

(f) Structural stabilization practices shall be sloped to 1.5 horizontal to one foot vertical or flatter. Banks treated only with vegetation shall be sloped to 2 feet horizontal to one foot vertical or flatter.

(g) The total project length may not exceed 500 linear feet per ¼ mile of stream (1320 feet).

(h) Associated fish habitat structures shall be constructed according to Hunt (1993).

Note: Hunt (1993) —Trout Stream Therapy, R.L. Hunt. University of Wisconsin Press, Madison, WI.

(i) All stone above the ordinary high water mark shall be top dressed with a minimum of 6 inches of top soil.

(j) Except as provided in sub. 3(i), revegetation shall follow practice standards found in Wisconsin Biology Technical Note #1: Shoreland Habitat, found at <ftp://ftp-fc.sc.egov.usda.gov/WI/technotes/biology-tn1.pdf>.

**(6) REPLACEMENT OF AN EXISTING SEAWALL WITH INTEGRATED BANK TREATMENT.** Replacement of an existing seawall with integrated bank treatment on the bed or bank of a river or stream may be authorized under a general permit if it meets all of the requirements of subs. (3) and (5).

**(7) INDIVIDUAL PERMIT REQUIRED.** (a) Activities which do not meet the applicable standards in sub. (3), (4), (5), or (6) are otherwise ineligible for a general permit shall require an individual permit.

(b) The department has authority under s. 30.206(3r), Stats., to require an individual permit in lieu of a general permit.

**NR 328.36 Individual permits. (1) PROCEDURES.** (a) Individual permits shall be processed according to the procedures in ch. NR 310.

(b) If the department determines that a proposal submitted under this section has the potential to impact an endangered or threatened species in accordance with s. 29.604, Stats., the application shall be deemed incomplete. The department may not consider the application complete or issue an individual permit until the applicant submits documentation to demonstrate one of the following:

1. The project avoids impacts to the endangered or threatened species in accordance with s. 29.604, Stats.

2. The project has received an incidental take authorization under s. 29.604, Stats.

(c) If the applicant modifies the project plans to meet the requirements of par. (b), the modified plans shall be submitted before the department may consider the application complete or issue an individual permit.

**(2) ANALYSIS OF INDIVIDUAL PERMITS.** The department shall consider factual data from applicant regarding all of the following factors in evaluating individual permit applications:

**Note:** The department's analysis of individual permits is not constrained to the general permit standards identified in s. NR 328.35.

(a) The cumulative and individual impact on public rights and interests including fish and wildlife habitat, physical, chemical and biological effects on the adjacent waterway and natural scenic beauty including: interference with navigation and its incidents, i.e, swimming, boating, fishing and hunting; impacts on natural scenic beauty; and impacts on special concern, threatened or endangered species.

**Note:** Less developed reaches of rivers and streams will experience greater impacts on natural scenic beauty from the structure and its activity than other more developed reaches.

(c) Impacts on bank and in-stream habitat including: reduced density of woody cover in shallow water; reduced density, coverage and diversity of nearshore vegetation, such as terrestrial, emergent, floating-leafed and submerged zones; designated sensitive areas, spawning or nursery habitat.; change in substrate that reduces its suitability for habitat.

(d) The erosion potential of the site as determined by the methods in s. NR 328.38.

(e) The erosion potential of the site based on site-specific conditions, including ice.

(f) The effect of the project on the adjoining upland, its ability to prevent erosion and sedimentation into the waterway, and the relative contribution of bank erosion to any excess nutrient load to the stream.

(g) Whether project designs or specific conditions can avoid or reduce impacts of the structure. Designs shall have high likelihood of success, and duration equal to the life-span of upland structures to be protected, if any.

(h) Whether streambank protection measures allowed without permits or with a general permit would provide adequate erosion control.

**NR 328.38 Data requirements and site assessment methods.** Applicants and department staff shall adhere to the following data requirements and site assessment methods:

**(1) IDENTIFICATION OF ECOREGIONS AND URBAN AREAS.** Ecoregions and urban areas identified in Figure 1 are based scientific literature characterizing the ecology of Wisconsin streams (Lyons et al. 1996; Wang, et al.1997; Lyons et al. 2001; Wang et al. 2003; and Weigel et al. 2006). The department shall provide applicants with maps and internet-based location tools for the purpose of determining ecoregion and urban watersheds.

Figure. 1

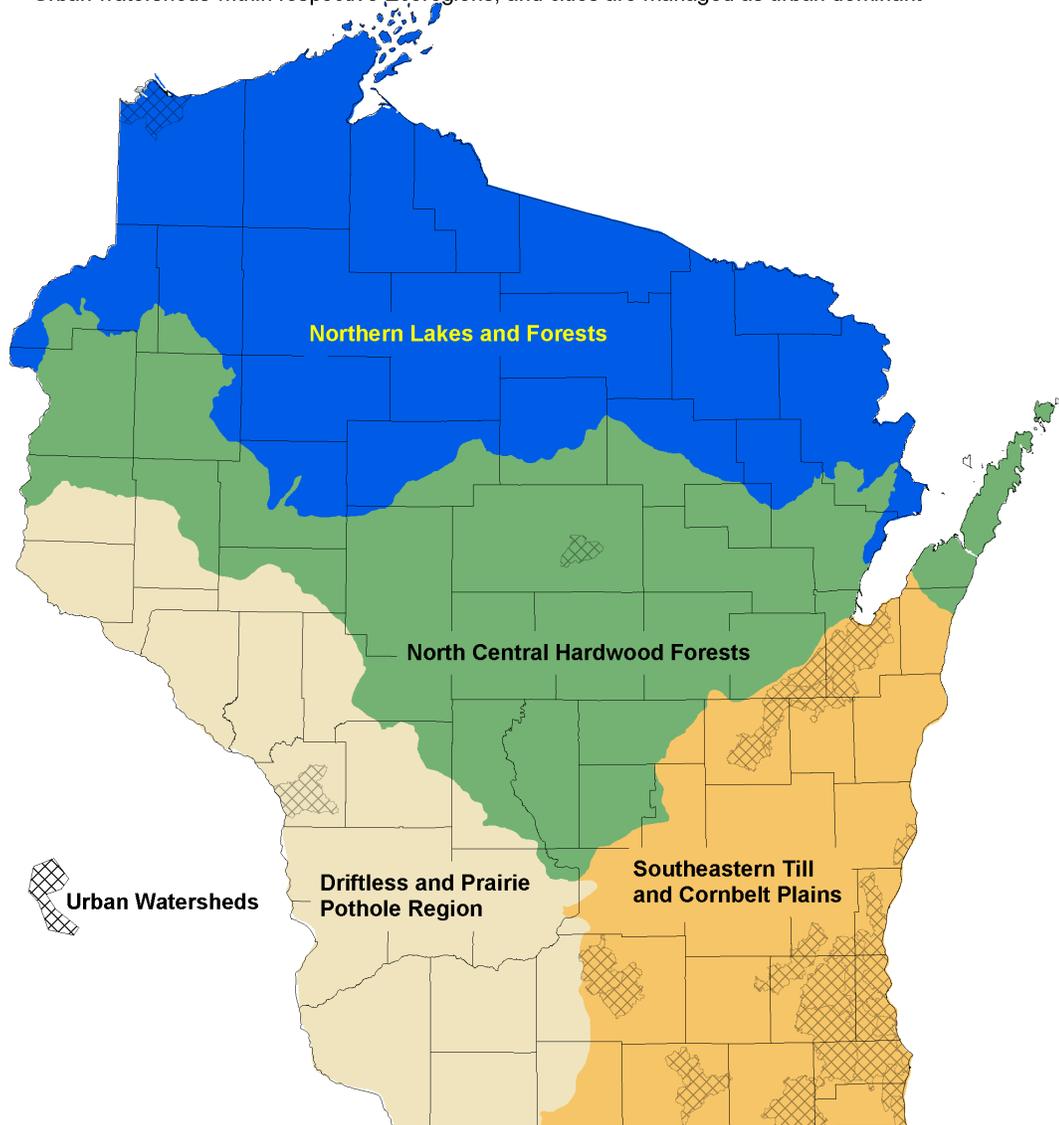
GP/IP Permit Classification of Erosion Control Standards on Streams and Rivers

Based on Level III Ecoregions of Wisconsin and Urban Watersheds

Southeastern Till/Cornbelt Plains, and Driftless/Prairie Pothole Region are managed as agriculture dominant

North Central Hardwood Forests and Northern Lakes and Forests are managed as forest dominant

Urban watersheds within respective Ecoregions, and cities are managed as urban dominant



Note: Lyons, J., L. Wang, and T. Simonson. 1996. Development and Validation of an index of biotic integrity for coldwater streams in Wisconsin. *North American Journal of Fisheries Management* 16: 241-265.

Wang, L., J. Lyons, P. Kanehl, and R. Gatti. 1997. Influences of watershed land use on habitat quality and biotic integrity in Wisconsin streams. *Fisheries* 22(6):6-12.

Lyons, J., R.R. Piette, and K.W. Niermeyer. 2001. Development, validation, and application of a fish-based index of biotic integrity for Wisconsin's large warmwater rivers. Transactions of the American Fisheries Society 130:1077-1094.

Wang, L., J. Lyons, P. Rasmussen, P. Seelbach, T. Simon, M. Wiley, P. Kanehl, E. Baker, S. Niemela, and P.M. Stewart. 2003. Watershed, reach, and riparian influences on stream fish assemblages in the Northern Lakes and Forest Ecoregion, U.S.A. Canadian Journal of Fisheries and Aquatic Sciences 60: 491-505.

Weigel, B.M, J. Lyons, and P. Rasmussen. 2006. Relative influence of environmental variables at multiple spatial scales on fishes in Wisconsin's warmwater nonwadeable rivers. American Fisheries Society Symposium 48:493-511.

**(2) CALCULATION OF STREAM BANK EROSION INTENSITY INDEX.** The department shall provide applicants with worksheets and internet-based computer software for the purpose of calculating the bank erosion potential index (BEPI). When the department or applicants assess erosion at the bank stabilization site they shall apply methods outlined in Table 1 to calculate a bank erosion potential index (BEPI) score. For each continuous treatment site of 300 feet or less, applicants shall submit at least one BEPI assessment. For continuous treatments greater than 300 feet applicants shall conduct and submit BEPI assessments at 150 foot intervals along the treatment site.

**Table 1. Bank Erosion Potential Index (BEPI) Score Worksheet**

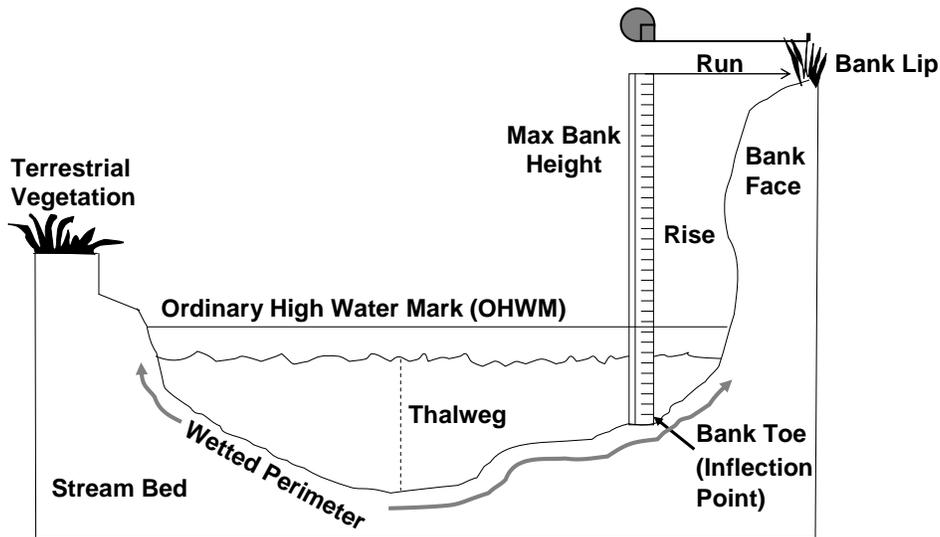
Applicants and department staff shall use this worksheet to calculate erosion intensity pursuant to s. NR 328.38 (2).

STREAMBANK VARIABLES	DESCRIPTIVE CATEGORIES					SCORE
	Erosion Intensity Value is Located in Parenthesis at Bottom of Each Category Box.					
<b>Bank Materials</b> – predominance of bank materials at toe (between bed and <sup>1</sup> OHWL on bank face).	Cobble >3 inches  (-10 points)	Silt/Clay  (0 points)	Gravel <3 inches  (5 points)	Sandy Gravel  (7 points)	Non plastic sands and silts (10 points)	
<b>Hydraulic Influence of Upstream Structures</b> – distance (number of channel widths) to bridges, culverts, or dams. <u>Calculation:</u> Number of Channel Widths= Stream Distance to Structure / Average Channel Width	10+ channel widths  (1 point)	5.1-10 channel widths  (2 points)	2.1-5 channel widths  (3 points)	0-2 channel widths  (4 points)		
<b><sup>2</sup>Max Bank Height (feet) Divided by the OHWL Height (feet)</b>  <u>Calculation:</u> Max Bank Height / OHWL Height	1 – 1.19  Very Low or Low  (2 points)	1.2 – 1.5  Medium  (5 points)	1.6 – 2.0  High  (7 points)	2.1 – 2.8  Very High  (8 points)	>2.8  Extreme  (10 points)	
<b><sup>3</sup>Bank Slope (degrees)</b> - measure rise/run and translate into angle degree <u>Calculation:</u> Bank Slope=	0 – 20  Very Low	21 – 60  Low	61 – 80  Moderate	81 – 90  Vertical	91+  Undercut	

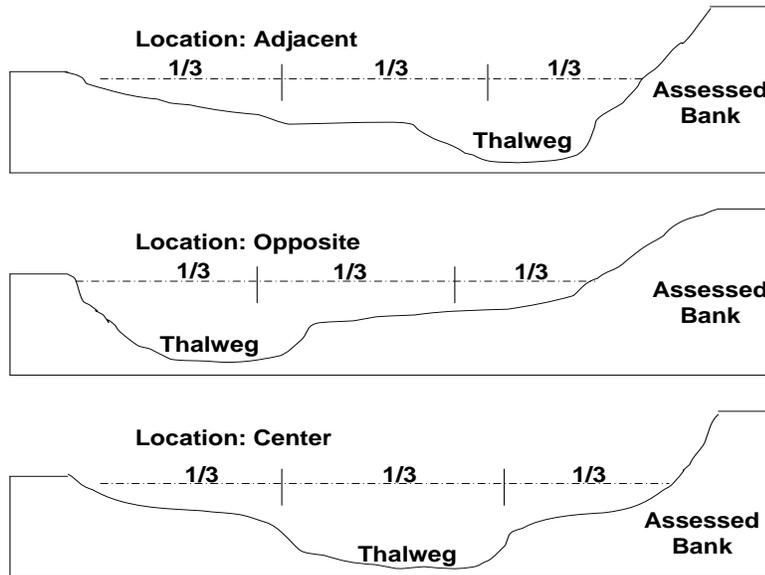
Inverse Tangent (Rise/Run)	(1 point)	(3 points)	(5 points)	(7 points)	(10 points)	
<b>4Stratification/ Bank Layering</b> – type of soil layering occurring on the bank face.	No stratification  (0 points)	No stratification, seepage present  (3 points)	Stratified above OHWM  (4 points)	Stratified above OHWM with seepage present, or stratified below OHWM (7 points)	Stratified below OHWM with visual seepage (10 points)	
<b>5Bank Vegetation</b> – abundance of the vegetation, roots, and tree-falls occurring between the OHWM and the bank lip.	Rock outcrop bank– unable to support vegetation.  (-7 points)	Dense vegetation <30% bare soil visible  (-4 points)	Clumps of vegetation 30-59% bare soil visible  (0 points)	Sparse vegetation 60-90% bare soil visible  (4 points)	Vegetation absent >90% bare soil visible  (7 points)	
<b>6Thalweg Location</b> - deepest part of the channel and the location of stream current.	Located across the stream, against opposite bank  (0 points)	Flowing down the center of the stream channel  (2 points)	Immediately adjacent to bank proposed for erosion control (8 points)			
<b>Bank Erosion Potential Index (BEPI) Score</b>						

**Note:** Table 1 is adapted from Rosgen, David L. “A Practical Method of Computing Streambank Erosion Rate”, Wildland Hydrology Inc., Pagosa Springs, CO, 10 pp.

1. Ordinary High Water Mark (OHWM) means the point on the bank or shore up to which the presence and action of water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation or other easily recognizable characteristics.
2. Maximum bank height means the vertical measure (feet) from the bank toe to the top of the bank lip, irrespective of changes in the water level. Bank toe is the inflection or bending point between the bank face and stream bed.
3. To measure the bank slope (degrees), the rise and run must be measured from the bank toe to the top of the bank lip. With your measure tape or stick, place the end firmly on the bank toe, parallel to the bank face and measure up to the bank lip to find the rise or max bank height. Subsequently, measure the run from the bank toe to the bank lip. From these measures, one should be able to calculate the bank slope with the formula ‘bank slope= inverse tangent (rise/run)’. Additionally, the BEPI Calculator is available on the department’s website <<http://.html>>. This website automatically calculates the bank slope and BEPI score after inputting fields for bank materials, structures upstream, OHWM height, max bank height, distance to bank face, bank layering/stratification, bank vegetation, and thalweg location.



4. Stratification or bank layering means soils consisting of alternating layers of varying soils or textures.
5. Bank vegetation is the type and abundance of vegetation occurring between the ordinary high water mark (OHWM) and the bank lip. To assess the abundance of vegetation on the targeted bank, apply a 10 foot wide window of assessment from the OHWM to the top of the bank. The following percentages are assigned for the categories: bare soil visible over less than 30% of the surface area=dense vegetation; bare soil visible across 30-59% of the surface area= clumps of vegetation; bare soil visible across 60-90% of the surface area = vegetation sparse; bare soil visible across > 90% of the surface area = vegetation absent. Root wads, tree falls, and snags on the bank are considered in this assessment, because of their influence on thalweg, sediment transport, scour, and bank protection. After assessing the percentage of bare soil in the 'box', record its associated point value.
6. Thalweg means the deepest part of the channel or the location of fastest current. To find the thalweg, the channel must be divided into thirds. The applicant needs to perform one or a mixture of tests for the three segments in determining its location. The following tests are suggested: float an orange peel, tennis ball, etc., down the stream to find the segment of fastest current, find the segment with the bubble line visible at the water's surface, or find the deepest part of the channel, if safe. After locating the thalweg, record its proximity to the tested bank, adjacent (closest), center, or opposite (furthest) and record its associated point value.



**NR 328.39 Enforcement. (1)** Noncompliance with the provisions of ss. 30.12, 30.20 and 30.206, Stats., this chapter, or any conditions of an exemption, general permit or individual permit issued by the department, constitutes a violation and may result in a forfeiture, fine or imprisonment. The department may seek abatement under s. 30.294, Stats., for any activity in violation of ss. 30.12, 30.20 and 30.206, Stats.

**(2)** If the activity may be authorized by a general permit under s. 30.206, Stats., failure of an applicant to follow the procedural requirements may not, by itself, result in abatement of the activity.

**(3)** When an after-the-fact permit application has been filed with the department, the department shall follow the procedures in ch. NR 301 for violations.

**(4)** Any violation of these rules shall be treated as a violation of the statutes they interpret or are promulgated under.

**(5)** No person may place a shore erosion control structure in a navigable waterway if the activity is not eligible for an exemption, authorized by a general permit or individual permit issued under this chapter, or otherwise authorized under this chapter.

**SECTION 3. EFFECTIVE DATE.** This rule shall take effect on the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2)(intro.), Stats.

SECTION 4. BOARD ADOPTION. This rule was approved and adopted by the State of Wisconsin Natural Resources Board on \_\_\_\_\_ .

Dated at Madison, Wisconsin \_\_\_\_\_.

STATE OF WISCONSIN  
DEPARTMENT OF NATURAL RESOURCES

By \_\_\_\_\_  
Scott Hassett, Secretary

(SEAL)