

WETLAND MITIGATION AT GREYSTONE RIDGE, ORLAND PARK, IL

5 YEAR MANAGEMENT AND MONITORING PLAN

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Introduction

Beechen & Dill Homes will implement a 5-Year Wetland Management and Monitoring Plan for the wetland mitigation and natural areas within the Greystone Ridge Project, located in Orland Park, Illinois. The purpose of this Wetland Management and Monitoring Plan is to define the responsibilities of the owner in regards to the wetland mitigation and natural areas.

The success or failure of the project is largely dependent upon completion of maintenance and monitoring during the five-year management program. The following Wetland Management and Monitoring Plan includes a schedule describing Wetland Mitigation Performance Standards and Reporting and Compliance requirements.

Vegetation Performance Standards

The following Ecological Performance Standards apply to the Wetland Mitigation Basin and associated prairie buffer that are providing wetland mitigation credit on-site.

1. A temporary cover crop shall be planted on all slopes immediately upon completion of any earthwork to prevent soil erosion. Soil erosion and sediment control measures shall be in place during all construction work. Erosion control blanket will also be required on the slopes. Within three (3) months, at least 70% of this area, as measured by aerial coverage, will be vegetated; either by cover crop or erosion control blanket. If the desired long-term slope vegetation is not planted with the temporary crop, it shall then be planted in the first available growing season appropriate for each plant community. All cover crop species shall be non-persistent or native and not allelopathic.
2. Species selected for the planting shall be native to the county where the mitigation site is located (ref. Swink and Wilhelm, Plants of the Chicago Region, 1994), and shall be appropriate for the hydrologic zone to be planted. The site shall contain the minimum number of native perennial species as outlined below per plant community.
 - **Wetland Bottom Marsh**- minimum of 15 native perennial species
 - **Wet to Mesic Prairie**- minimum of 25 native perennial species
 - **Mesic Prairie (buffer)** - minimum of 20 native perennial species
3. At least 50% of the required minimum number of species above shall occur at a 5% frequency or greater, within each plant community zone or area. Multiple transects within a given plant community may be combined for this frequency analysis.

4. A native mean coefficient of conservatism value (native mean C value) of greater than or equal to 3.5 shall be achieved in each separate vegetated plant community (e.g. wet prairie, marsh, mesic prairie buffer), and as measured over the entire mitigation site area. Native plant species coefficients of conservatism are designated in Swink, Floyd and Gerould Wilhelm, *Plants of the Chicago Region* (Indianapolis: Indiana Academy of Science, 4th edition, 1994).

Interim Yearly Standards:

- a. By the end of the first full growing season, at least 30% of the vegetation present within the planted wetland and buffer mitigation area shall be native, non-invasive species.
- b. By the end of the second full growing season, at least 50% of the vegetation present within the planted wetland and buffer mitigation area shall be native, non-invasive species.
- c. By the end of the third full growing season, at least 60% of the vegetation present within the planted wetland and buffer mitigation area shall be native, non-invasive species.
- d. By the end of the fourth and fifth full growing seasons, at least 80% of the vegetation present within the planted wetland and buffer mitigation area shall be native, non-invasive species.

5. The native floristic quality index value (native FQI) shall be greater than or equal to 20 in each separate vegetated community zone and as measured over the entire mitigation site. The floristic quality assessment method is described in Swink and Wilhelm, *Plants of the Chicago Region*.

Steps # 4 and #5 are evaluated based upon the overall plant community inventories as well as transect summaries.

6. No area over the entire mitigation site greater than 1 square meter shall be devoid of vegetation, as measured by aerial coverage, unless specified on approved mitigation plans. This standard does not apply to emergent, streamside and aquatic communities.
7. None of the three most dominant plant species in any of the wetland or prairie community zones may be non-native species or weedy species, including but not limited to:
 - *Typha angustifolia*
 - *Typha X glauca*
 - *Phragmites australis*
 - *Lythrum salicaria*
 - *Salix interior*

- Phalaris arundinacea
- Melilotus spp.
- Daucus carota
- Dipsacus spp.

These species shall not cumulatively comprise more than 15% of the total percent cover (not relative cover) for each planted restored community. This standard does not apply to existing emergent wetland, streamside and aquatic communities or enhancement areas.

8. The native perennial species within each wetland and prairie buffer plant community shall represent at least 70% of the total dominance measure. A lower percent native perennial species of the total dominance measure may be acceptable if it is demonstrated with transect data that the remaining dominance percentage is by native annual and biennial wetland or prairie plant species and the FQI and mean C standards are exceeded.
9. A vegetation map of the mitigation site based on as-built drawings developed at the completion of implementation shall be submitted. This information shall be descriptive and define the limits of all vegetation areas by community type, based on field observations. The permanent transects shall be shown on this map. Representative photographs of each vegetation area by general community zone shall be submitted to the Village of Orland Park.

Hydrology Performance Standards

Wetland hydrology shall be demonstrated according to the standards and guidelines as presented in the Corps of Engineers Wetlands Delineation Manual (1987) and/or any appropriate approved supplement. During Year One: Hydrology monitoring shall be conducted every 2 weeks during the growing season (April 15-October 15) to demonstrate adequate hydrology for the wetland mitigation area. During Years 2-5: Hydrology monitoring shall be conducted in conjunction with semi-annual monitoring to demonstrate adequate hydrology. In addition to this minimum, hydrology data should reflect a hydrologic regime that is appropriate to the native plant community proposed for establishment.

Monitoring and Maintenance Standards

Monitoring and data collection are intended to assess whether the mitigation area has attained the previous performance standards. Monitoring and maintenance may be required for five (5) years from the completion of planting of the wetland area. It shall also be recognized that the Village of Orland Park may issue early compliance sign-off if the required performance standards have been met. It shall also be recognized that monitoring and maintenance may need to continue beyond the five (5) year period until full performance standards are attained.

Wetland Delineation

To meet full performance standards, a routine wetland delineation shall be performed to verify the total acreage of wetlands achieved on site. If requested by the Village of Orland Park, the wetland areas shall be staked for final inspection. The delineation shall be included/reported in the final monitoring report, if not before. It is recognized that the actual acreage of aquatic resources/wetland will vary from that in the plans; however, it shall approach or exceed the acreage specified in the permit.

Vegetation Monitoring

Permanent straight line sampling transects shall be established, plotted onto project drawings and a current aerial photograph of the site, across each proposed plant community of the mitigation site. Sufficient transects shall be established to provide full representation of all plant communities within the site, which might include more than one of each type. Each transect shall consist of a series of 1.0 square meter quadrats (no fewer than 10) at regular or random intervals (5-10m suggested interval). The number of quadrats depends on system complexity and the size of each plant community for which credit is sought. A rough guideline is 2 quadrats per acre in each plant community as a minimum. The plant sampling shall be done in May/June and September/October each year following the initial planting, throughout the monitoring period. Data shall be reported by plant community, and by transect. A total plant species list should be compiled over the entire site for which credit is sought. Data may be summarized by plant community for which credit is sought in monitoring reports, however, the full sampling data should be provided in an appendix to the annual monitoring report. Species dominance shall be determined by calculating importance values, with at least the following two parameters: frequency and percent cover. Absolute percent aerial cover data should be reported, though the frequency and cover may be relativized to calculate Importance Values (e.g. RF + RC = IV).

Vegetation Maintenance

1. First Year. Mow the non-wetland/emergent planted areas to a height of 6-8 inches 2-4 times during the early growing season and as needed to control non-native and invasive species. Mowing (including weed whipping) shall take place prior to or when non-native and invasive species are flowering so as to prevent seed set. Control undesirable plant species, when present in small quantities, by hand pulling prior to the development and maturity of the plant. Hand removal shall include the removal of all aboveground and belowground stems, roots and flower masses prior to development of seeds. Apply herbicide (as necessary) to non-native and invasive species within the naturalized areas with appropriate herbicide. Management site visits should be conducted at a minimum of 3-4 times annually.

Herbicide should be applied by a trained and licensed applicator. Non-selective herbicides can be used but with utmost caution. Non-selective herbicides are absorbed through the plant tissues and work their way into the root system, effectively

killing the plant. The only acceptable non-selective herbicides are glyphosate based such as RoundUp, Rodeo, or Razor. The only acceptable selective herbicides (i.e. targeting broad leaf and woody plants) are 2,4-D (2,4-Dichlorophenoxyacetic acid) based or triclopyr based such as Garlon 4.

2. **Second Year.** Control of undesirable plant species during the second growing season shall consist primarily of herbicide application. Mowing (including weed whipping) shall be conducted two to four times during the early growing season and as needed to a height of 6 to 8 inches to prevent annual weeds from producing seed. Management site visits should be conducted at a minimum of 3-4 times annually.

3. **Third Year.** Undesirable plant species will be controlled (as necessary) by mowing (including weed whipping), hand pulling, and/or spot herbicide application. At the completion of the third growing season (dependent on fuel availability; dominance of graminoid species, i.e. grasses and sedges, is required for successful burning), fire **may** be introduced to the planted areas as the primary management tool. Trained professionals experienced in the fuel types present shall conduct burning. State and local permits shall be obtained prior to prescribed burning. Prior to a prescribed burn, surrounding property owners as well as local police and fire departments will be notified. A burn plan designating the preferred wind direction and speed, location of firebreaks, and necessary personnel and equipment shall be prepared and utilized in planning and burn implementation.

The initial burn shall be dependent on fuel availability that is directly related to the quantity and quality of grasses, sedges, and forbs present within the planting area. The burn season runs from November 1 through April 30 and burns shall be conducted whenever conditions are suitable. Generally, a new prairie/wetland area shall be burned after the third growing season and then every other year thereafter, burning approximately 50-75% of the area. Continue to performance management site visit 3-4 times annually during the growing season. **IF PRESCRIBED BURNING CANNOT SAFELY BE CONDUCTED:** it is recommended to conduct a late fall mowing with thatch removal on the site. This mowing/removal will mimic the conditions and benefits of a controlled burn; however, if conditions preclude the use of fire, prescribed burning is not recommended.

Monitoring Reports

An annual vegetation monitoring report will be submitted to the Owner and the Village of Orland Park by December 31st following the monitoring season each year. This report will be used to determine if the natural areas are meeting performance standards. The report shall include information on site location; permit numbers; methodology used (including monitoring dates); data results; summary relative to performance criteria; a summary of the annual monitoring observations; a description of the management performed during the year; a list of recommendations for management during the upcoming year; and representative photographs of the natural areas. The wetland mitigation area shall meet certification requirements, associated

performance standards, and will be monitored and maintained for a period of five years or until performance standards have been met to ensure successful establishment.

Adaptive Management

1. If monitoring or other information indicates that the compensatory mitigation project is not progressing towards meeting its performance standards as anticipated, the responsible party shall notify the Village of Orland Park as soon as possible. The Village and/or its representative will evaluate and pursue measures to address deficiencies in the compensatory mitigation project.
2. The Village of Orland Park, in consultation with the responsible party (and other federal, tribal, state, and local agencies, as appropriate), will determine the appropriate measures. The measures may include site modifications; design changes, revisions to maintenance requirements, and revised monitoring requirements. The measures shall be designed to ensure that the modified compensatory mitigation project provides aquatic resource functions comparable to those described in the mitigation plan objectives.
3. Performance standards may be revised in accordance with adaptive management to account for measures taken to address deficiencies in the compensatory mitigation project. Performance standards may also be revised to reflect changes in management strategies and objectives if the new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project. No other revisions to performance standards will be allowed except in the case of natural disasters.

Long Term Management

1. Long-Term Management will be the responsibility of the Village of Orland Park.
2. All land, including associated uplands, which are part of the mitigation site shall be protected from future development by a permanent conservation easement, deed restriction or other real estate instruments as deemed appropriate by the Village of Orland Park.