Module 4:

Design and Performance Standards

Design and Performance Standards - Design Considerations

- Design to support other Chesapeake Bay Agreement goals beyond nutrient and sediment reduction. Goals include stream health, improving IBI scores, riparian forest buffer, fish passage, and wetland acreage and functional gains.

- Design stream restoration to maintain or improve habitats for other sensitive species, their habitats, and rare communities.

- Post-construction water levels are generally recommended to mimic the hydroperiod of the soil type, however, increased water levels and flood frequency may be approved provided there are no increases in flooding on adjacent properties without permission, and the design approach satisfies any MDE concerns and requirements, especially related to existing resources.

- <u>Tree retention is generally a priority. Designer, construction manager, agency, and other environmental inspectors/monitors (if required) should walk the site together to identify trees to be cut, removed, and protected, and where access points and staging areas should be located.</u>

Design and Performance Standards - Design Considerations

Photo courtesy Biohabitats

Design and Performance Standards - Design Considerations

- **Design for a minimal limit of disturbance. Also helps prevent spread of NNIS**

- **Limit disturbance of strongly, very strongly, or extremely acidic soils.**

- **Design and place instream structures based on channel slope, rather than at set intervals.**

- **Do not overdesign. Minimal alterations help to maintain the quality of existing natural and water resources, or not worsen condition.**

Design and Performance Standards - Design Considerations

- Consider the impacts of different types of equipment, and, where feasible, plan to use equipment that minimizes soil and vegetation disturbance.

- Retain native vegetation in and around the activity area to the greatest extent practicable.

- Consider the option to choose not to carry out an activity where the spread of NNIS is likely to negatively impact the restoration project. To minimize the spread of NNIS, use existing roads to the extent practicable.

- Avoid constructing new roads, skid trails and landings in areas infested with NNIS where practicable.

- Limit the number, width, and length of roads, skid trails and landings to help minimize soil disturbance and to limit the risk of unintentionally transporting NNIS into non-infested areas.

Design and Performance Standards - Design Considerations

Photo: MDE

Design and Performance Standards - Design Considerations

- Most nontidal wetland Key Wildlife Habitat types associated with Piedmont and Coastal Plain streams are forested.

- Design the project to restore hydroperiods which are appropriate for the site and soil type. Most forested wetland have fluctuating water levels.

- Designs should follow the Maryland Wildlife Action Plan recommendations for these habitat types to be managed to maintain closed or semi-open tree canopy.

- The exceptions are the Piedmont Seepage Wetland (Wet meadow/fen and Coastal Plain Seepage Bog and Fen category, which have shrub and/or emergent communities.

Design and Performance Standards - Design Considerations

- Approach the restoration project without a pre-determined design. Site-specific considerations should determine the type of design appropriate for the site.

- Do not design for increased inundation at sites which already flood, as modeled for low recurrence intervals or visual indicators.

- Designs to increase inundation in floodplains (e.g. 10-year recurrence interval may have some additional increased connection, without increasing flooding on adjacent properties or threatening survival of desired species.

Design and Performance Standards - Design Considerations

Legacy sediment removal

- **Legacy sediment removal projects involve high amount of disturbance and remove existing surface vegetation.**

- **The practice is generally not desirable in forested systems, and requires additional justification.**

- **Existing riparian wetland areas with low-scoring assessments, little or no vegetation, or existing trees in poor condition, extensive coverage of invasive species, adjacent to deeply incised streams with a buried organic soil layer, may be considered for approval.**

- **Legacy sediment removal should not be done over existing underground infrastructure.**

Design and Performance Standards- Design Considerations

- **Out-of-type restoration should generally be limited to sites in poor condition for both overall hydrology and vegetation/habitat.**

- **Design should allow for post-construction adjustments to adjust for water levels, elimination of new blockages, etc.**

Design and Performance Standards- Performance Standards

- Aquatic life can pass over, around, or through the structure at base flow.

- Water levels must not exceed authorized increases on other properties.

Also:

- Implement designs which can be modified if performance standards not met.

- A performance bond in sensitive areas or for very site-specific permit conditions can be required.

Design and Performance Standards - Vegetation Performance Standards

- May set tree retention standard, e.g 40 ft² of basal area, evenly distributed/acre has been used in forest harvest buffers

- MDE may specify standard or extent of canopy closure. Water levels may require modification to reduce mortality of trees under wetter conditions and retain desired amount of forest

- Additional plantings may be necessary to improve habitat and add missing or limited strata. Protective measures should be used to prevent herbivory. Fencing or cages may be more visually appealing and acceptable to neighbors.

Design and Performance Standards - Special Habitat Standards

- **MDE may require site-specific conditions and standards to protect or improve habitat for rare species or plant communities, or areas of high quality natural or aquatic resources.**

- **Onsite monitors/inspectors can be required in highly sensitive areas with specific protection measures.**

- **Monitors can be required to report and consult with regulatory agencies prior to deviating from any approved plans.**

Next Steps

Recommendations Welcome for:

- **Additional Practices to Protect Wetland/Riparian Areas**
- **Format/Ease of Use of Forms**
- **Assessment**

Recommendations to be Considered for Future Revisions in 2024

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