# Community and Commercial Stormwater Ponds

## Parish Governments

**For local communities, stormwater retention ponds are associated with flood control and water quality improvements. Many of the desired benefits of these ponds are based on their design and maintenance. To optimize costs and returns for local parish governments, care should be taken when determining functionality so as to fit the space configuration, estimated volume of water and anticipated maintenance budget for the area. This is a critical step to maximize the value of the retention ponds for flood prevention, and also for habitat creation and recreational activities. When properly designed and maintained, these ponds can become a community asset by enhancing property values, providing a wildlife refuge, improving aesthetics and offering recreational or educational opportunities. Additionally, this can also provide community support for operational costs associated with maintaining healthy retention ponds. The following are standard scenarios for which retention ponds are designed with considerations for secondary benefits.**

### ▶ Flood Control and Impervious Surface Runoff

**Primary Focus:** Stormwater ponds are primarily used for the mitigation of risks associated with flooding and runoff directed from impervious surfaces like parking lots or roads. These pond systems are designed with the intention of collecting and transporting water while reducing contamination that may be washed downstream. Depending on the space allocation and estimated flow, either dry or wet ponds can be used for water collection. These pond styles will affect the design of water depth, vegetation, and the surrounding landscape.

**Secondary Focus:** A dual-purpose opportunity for this type of risk mitigation pond can be local habitat development. This can improve natural areas for terrestrial and aquatic species, as well as local vegetation. Because plants are used to absorb nutrients and contaminants from runoff events, these ponds should be designed with strategic placement of local species. A detailed list of plant types is provided at the end of the publication. In addition, the LSU AgCenter has extensive guides for plants that can be used for bioretention areas. The selected vegetation will not only impact the absorption of compounds, but also the habitat for various wildlife species, leading to biodiversity and habitat development. It is critical to design dry and wet ponds with the intent to build a habitat to maintain dual functionality.

**Ponds surrounded by local plants can have better water quality and support a variety of species for a balanced ecosystem.**

**Maintenance Impact:** For ponds that support runoff collection and build natural habitats, two key maintenance tips are regular litter cleanup and effective landscape management. Runoff brings unwanted litter into the pond setting, which can have negative impacts on the ecosystem. Collection areas should be checked periodically, and any visible trash removed. This can also be an opportunity to call on community-based educational programs for clean-up events to maintain healthy habitats. In addition to debris causing issues for the ecosystem, weed intrusion and plant overgrowth can also be detrimental to the ecosystem. Adequate resources should be reserved for mowing and preventative landscaping. Strategically planning the landscape around ponds can also promote natural wetland plant recruitment and decrease the overall areas needed for mowing contracts. This may include licensed professionals for both terrestrial and aquatic weed management. Ultimately, the plant section process will be the foundation for long-term management of the pond ecosystem. Establishing the right balance of native grasses and shrubs can build habitat, reduce runoff contaminants, and minimize monthly landscape maintenance.

## ▶ Compliance with Regulations

**Primary Focus:** In Louisiana, stormwater ponds are a regulatory requirement for projects that change the watershed, reduce wetland habitat or utilize large acreages of land for developments. In the cases of neighborhood construction, ponds are used as best management practices for displaced water, contaminants and mitigating water flow through the development. A common example is subdivisions building ponds to support construction and water runoff from impervious roads and house foundations. Ponds will be designed to collect water and have strategic outflows to surrounding watersheds to decrease the risk of flooding. These development projects require permitting and strict planning to ensure ponds are sized properly and can handle high volumes of water in the case of major events (i.e., 100-year storms). As plans are prepared for subdivision ponds, there are many factors that can increase the value for future homeowners.

**Secondary Focus:** A complementary purpose for residential stormwater ponds is to increase property value by improving aesthetics and recreational opportunities. Non-motorized boating (canoes or kayaks) and fishing are common options. Recreational boating benefits from amenities like piers and similar features to support access. Recreational fishing can be developed and maintained overtime by careful planning with the help of experts.

**Residential homeowners can enjoy the aesthetics and recreational value of living on retention ponds when they are well maintained and managed.**

**Maintenance Impact:** There are many factors in maintaining a healthy pond for aesthetics and supporting recreational fishing, which will be crucial for long-term operational plans. Water quality, and primarily fertility, must be balanced to maintain active populations of fish and prevent ponds from turning hypoxic. Smaller retention ponds can be in risk of decreased oxygen concentrations from warm water temperatures, excess nutrients and algae blooms. To help alleviate issues with low oxygen, fountains or other aeration can maintain sufficient levels or provide temporary refuges when oxygen is depleted. Utility and maintenance costs can be calculated and added to operational plans.

The movement and build-up of sediment can also impact pond fish. Channeling from sediments can fill in the structures fish use for habitat and cause water stagnation, leading to low oxygen levels. This can also cause clogging to water flow piping or aeration units, which leads to increased maintenance costs. Other important factors are landscaping and debris removal, which will impact on the overall aesthetics and safety for residents.

## ▶ Large-Land Developments

**Primary Focus:** A new trend for communities involves large commercial developments that incorporate town homes, businesses, recreation and other buildings into localized areas for connectivity. These developments fall under similar compliance to utilize best management practices like stormwater ponds for runoff. The ponds are used to treat contaminants from paved surfaces and collect displaced water from large acreage. Normally, they will incorporate a primary filtration from wetlands and a large pond space with ample aeration to maintain water quality. These ponds are designed for the primary compliance function for the construction-heavy development but will be a long-term fixture for community connectivity.

**Secondary Focus:** A complementary opportunity for this type of large development pond can be human connectivity through recreational activities. When designing these ponds to support human activity, plans could include paths for walking, hiking, and biking, water accessibility for kayaking and other non-motorized boating, and boardwalk or pier areas for events. Additional interaction benefits include natural exploration activities for all ages. Many local extension-based activities use community parks or recreational areas to host educational events for all ages, and programmatic events to promote topics of interest (birding, fishing, water quality) in particular regions. Local parishes and developers can work toward optimizing new stormwater ponds by incorporating more recreational spaces for community audiences.

**Maintenance Impact:** The main management factor for recreational activity areas is preventive maintenance and landscape development. Landscaping and safety factors will be operational costs that must be incurred to support the aesthetics of the pond and the interests of the local community. Weed intrusion and overgrown grass around walking paths, unattended brush that restricts access to water and damaged or broken piers and boardwalks can jeopardize safety for patrons and deter beneficial use of community areas. Issues with long-term maintenance plans are typically the responsibility of the oversight group, whether that is the parish, city or developer. Community volunteer teams can be enlisted for clean-up days and beautification events, but activities can be limited to their expertise and abilities. Other options will be necessary for larger repair and maintenance projects.

**Functional areas such as boardwalks and water features can increase the appeal of stormwater ponds and offer spaces for community connectivity.**

## Plants that can Grow in the Water along the Sides of Wet Ponds

Pickerelweed – *Pontederia cordata*
Arrowheads – *Sagittaria latifolia, S. lancifolia*
Arrow Arum – *Peltandra virginicus*
Lizard's Tail – *Saururus cernuus*
Alligator Flag – *Thalia dealbata*
Golden Canna – *Canna flaccida*
Soft Rush – *Juncus effusus*

## Plants that can Tolerate Intermittent Flooding and Grow in Moist Soils – for Banks of Wet Ponds

Blue Star – *Amsonia tabernaemontana*
Swamp Milkweed – *Asclepias incarnata*
Climbing Aster – *Aster carolinianus*
Boltonia – *Boltonia asteriodes*
Turtlehead – *Chelone glabra*
Joe Pye Weed – *Eupatorium dubium*
Swamp Sunflower – *Helianthus angustifolius*
Swamp Mallow – *Hibiscus moscheutos* and hybrids
Texas Star – *Hibiscus coccineus*
Blue Flag Iris – *Iris virginica*
Louisiana Iris – *Hexagonae* species and hybrids
Seashore Mallow – *Kosteletzkya virginica*
Cardinal Flower – *Lobelia cardinalis*
Cinnamon Fern – *Osmunda cinnamomea*
Royal Fern – *Osmunda regalis*
Green Headed Coneflower – *Rudbeckia laciniata*
Goldenrod – *Solidago rugosa*
Ironweed – *Vernonia altissima*
River Oats – *Chasmanthium latifolium*
Panic Grass – *Panicum virgatum*
Lurid Sedge – *Carex lurida*
Fringed Sedge – *Carex crinita*
Southern Waxy Sedge – *Carex glaucescens*
White-topped Sedge – *Rhynchospora latifolia*
Woolgrass – *Scirpus cyperinus*
Soft Rush – *Juncus effusus*
Bulrush – *Scirpus spp.*
Spider Lily – *Hymenocallis palmeri*
Swamp Sunflower – *Helianthus angustifolius*
Bog Lily – *Crinum americanum*
Lizard's Tail – *Saururus cernuus*

## Plants that can Tolerate Dry Conditions and only 1-2 Days of Flooding – for Dry Ponds

Lady Fern – *Athyrium filix-femina*
Butterflyweed – *Asclepias tuberosa*
False Indigo – *Baptisia species*
Green and Gold – *Chrysogonum virginianum*
Mouse Ear Coreopsis – *Coreopsis auriculata*
Tickseed – *Coreopsis lanceolata*
Swamp Coreopsis – *Coreopsis rosea*
Gayfeather – *Liatris spicata*
Garden Phlox – *Phlox paniculata*
Rudbeckia – *Rudbeckia fulgida, Rudbeckia maxima*
Stokes Aster – *Stokesia laevis*
Verbena – *Verbena canadensis*
Muhly Grass – *Muhlenbergia capillaris*
Indiangrass – *Sorghastrum nutans*

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