

destruction/conversion was considered “Very High” and it was rated “Very High” in irreversibility potential. A source rating for the threat (residential development) was calculated from the combined scores for contribution and irreversibility. The final threat rating resulted from the combined source/stress rating from the viability table. The rankings of threats and sources of threats resulting from these assessments were used to prioritize threats to habitats within ecoregion, basin or coastal waters and this information was then used to develop conservation strategies addressing major threats for each habitat type. In order to develop conservation strategies to address the threats to species and their associated habitats, statewide meetings were held in order to gather technical and public input (Appendix I). As an example of the assessment procedure, the spreadsheets from the East Gulf Coastal Plain habitat/threats assessment may be viewed in Appendix J. A listing of all Threats and Sources of Threats identified during this assessment process and their definitions are found in Appendix K and Appendix L, respectively.

### G. Threats to Terrestrial Habitats

Threats that appeared repeatedly across terrestrial habitats and ecoregions included:

- Habitat destruction or conversion
- Habitat fragmentation
- Habitat disturbance
- Altered habitat composition and structure

**Habitat destruction or conversion** involves actions that permanently alter a habitat so that natural functions and values of the ecosystem are disrupted and are not considered restorable. Historically, this threat was widespread across all habitats throughout the state, and it remains a current threat facing wildlife habitats throughout Louisiana. When habitat destruction or conversion occurs, **habitat fragmentation** follows. The remaining habitat becomes isolated on the landscape as it is divided into smaller and smaller blocks. Wildlife populations in these fragmented habitats are isolated from other breeding populations, face increased competition for limited resources, and come into conflict with other land uses.

The sources of threat for both **habitat destruction** and **habitat fragmentation** include:

- **Residential development** – This source of threat is greatest in the EGCP, UEGCP, and areas surrounding major urban centers of the state
- **Commercial/industrial development** – This source of threat follows occurrence patterns similar to residential development
- **Conversion to agriculture or other forest types** – These actions completely remove the natural plant associations of a habitat, can damage soils, and displace native wildlife species
- **Development of pipelines, roads or utilities** – Construction activities destroy habitats, result in fragmentation of surrounding habitats, and can serve as vectors for invasive and alien species introductions

- **Channelization of rivers or streams** – This source of threat directly destroys aquatic species habitat
- **Gravel mining** – These activities also destroy aquatic habitats, often impact adjacent small stream forests
- **Construction of ditches, drainage or diversion systems** – This source of threat alters natural hydrology of a site and can result in destruction of wetland habitats

**Habitat disturbance** involves actions that may alter some aspects of a habitat, but these changes, while serious, are generally not permanent, or can be ameliorated through restoration efforts or management actions.

The sources of threat for **habitat disturbance** include:

- **Invasive/alien species** - Invasive plant and animal species pose a serious source of threat for most habitat types across the state, and can profoundly alter natural systems. These species can out-compete native species for limited resources, and many become pervasive, dominating entire habitats. Early detection and control are essential to halt the expansion of invasives.
- **Incompatible forestry practices** - This source of threat includes forest management activities that may alter in some way the natural processes or characteristics of a habitat type. These practices include but are not exclusive to activities such as broad application of herbicides that decrease diversity and alter composition of herbaceous plant layers, fire suppression causing denser tree and understory cover and decreased diversity in the understory, logging on sites when soils are saturated causing rutting and compaction, even-aged forest management and monoculture stands which decrease habitat diversity, and bedding of an area to enhance timber production of off-site commercial species.
- **Residential development** – This source of threat includes indirect affects from residential communities to surrounding natural habitats such as non-point source pollution causing degradation of wetlands, recreational use that damages soils, and introduction of invasive species that out-compete native flora and fauna.
- **Development of pipelines, roads or utilities** – This source of threat includes construction and maintenance activities that alter surrounding natural habitats such as stream siltation, storage of construction equipment, application of herbicides, and clearing of rights-of-way.
- **Construction of ditches, drainage or diversion systems** – This source of threat includes activities that alter the hydrology of natural systems such as construction of drainage ditches to either remove water from or divert water to a site.
- **Channelization of rivers or streams** – As with development of pipelines, roads and utilities, this source of threat includes construction and maintenance activities that alter surrounding natural habitat.

**Altered composition and structure** refers to changes in plant community species composition and community structure that result from human activity. Plant species usually associated with, or naturally occurring in, a certain habitat may or may not be present, they may not occur in expected numbers, or other species generally not occurring

in the habitat might become established. In addition, the natural habitat structure may be altered such that wildlife food and foraging areas, or nesting sites are no longer available. As with habitat disturbance, these changes can seriously alter a habitat type, but they can often be reversed through appropriate management or restoration efforts.

The sources of threats identified for **altered composition and structure** include:

- **Fire suppression** - Refers to the changes occurring in the historic frequency or patterns of fire in a natural habitat due to competing or surrounding land use practices, and public perceptions. Many of Louisiana's natural communities are fire adapted or dependent including all longleaf pine associations, bogs, and prairies. These plant and animal species associations developed in the presence of regular fire cycles, and fire is critical to maintaining these natural habitats. Fire has numerous benefits to natural systems (Moore 2001), including:
  - Seedbed preparation
  - Reducing woody plant competition
  - Preventing establishment and spread of invasive species
  - Recycling nutrients
  - Reducing hazardous fuel build-up
  - Maintaining herbaceous layer species diversity
  - Maintaining quality and abundance of food and nesting sites for many species

When natural fire regimes are altered or removed, all of the above benefits are lost, and the natural system composition and structure is altered through species succession and/or the establishment of invasive species.

- **Invasive/alien species** – Invasive or exotic plant species alter natural systems by out-competing native plants for habitat resources and replacing them within the plant community composition. Invasive or alien animal species can also alter composition and structure through severe disturbance of a habitat causing loss of certain native plant species in an area or allowing the introduction of invasive plants.
- **Incompatible forestry practices** – Some forestry or forest management practices such as establishment of monoculture stands, planting of off-site tree species or fire suppression alter the plant associations normally found in a habitat and change the natural community structure.
- **Construction of ditches, drainage or diversion systems** - These activities alter the hydrology of natural systems that can lead to a change in plant and animal species composition.
- **Livestock production practices** – These practices can damage aquatic habitats by decreasing water quality and related factors that, in turn, cause changes in aquatic species associations of a habitat.
- **Operation of dams and reservoirs** – As with construction of ditches, drainage or diversion systems, these activities alter the hydrology of natural systems, disrupting the transport of important nutrients and sediments and block the

movement of aquatic species that can lead to a change in native species associations.

## **H. Threats to Aquatic Habitats**

The decline of many native fish and mussel species is a result of the reduced quantity and quality of available habitat. Other specific causes of decline include levee construction, damming and channelization of the state's major rivers, including the Atchafalaya, Mississippi, Pearl, Red, and Sabine Rivers, for flood control and navigation along with agricultural uses, deforestation, erosion, pollution, and introduced species.

Threats that appeared repeatedly across basins included:

- Modification of water levels/changes in natural flow patterns
- Sedimentation
- Habitat disturbance
- Nutrient loading
- Altered composition and structure

Top sources of threats across all basins include:

- Channelization of rivers or streams
- Construction of navigable waterways
- Dam construction
- Invasive/alien species
- Levee or dike construction
- Oil and gas drilling
- Operation of dams and reservoirs
- Commercial/industrial development
- Conversion to agriculture or other forest types

## **I. Prioritization of Terrestrial Habitats by Ecoregions**

Conservation actions or strategies were developed for each terrestrial habitat and key wildlife species of conservation concern within each of the habitats to address threats identified by the habitat assessments. In order to maximize conservation benefits using available resources, ranking or prioritization lists of habitats were developed. These lists of priority habitats will allow LDWF to direct conservation efforts to those wildlife habitats and associated species of concern that need the most attention, and will bring the greatest benefit to the maximum number of species.

A process was formed to create the habitat priority list, and, as with the threats assessments, this process was completed by ecoregion (Chart 3.1). Within each ecoregion, the habitats were divided into two groups or tiers based on whether or not they occurred only in that ecoregion (Tier 1) or in multiple ecoregions (Tier 2). This first step