USDA Natural Resources Conservation Service

Ecological site R151XY004LA
Brackish Fluid Marsh 60-64 PZ

Accessed: 05/07/2024

General information

Approved. An approved ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model, enough information to identify the ecological site, and full documentation for all ecosystem states contained in the state and transition model.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 151X–Gulf Coast Marsh

Major land resource area (MLRA)151, Gulf Coast Marsh, is in Louisiana (95 percent), Texas (4 percent), and Mississippi (1 percent). It makes up about 8,495 square miles (22,015 square kilometers). The towns of Gretna, Chalmette, and Marrero, Louisiana, and the city of New Orleans, Louisiana, are in the eastern part of this MLRA. The town of Port Arthur, Texas, is in the western part. Interstate 10 and U.S. Highway 90 cross the area. The New Orleans Naval Air Station is in this MLRA. Fort Jackson, overlooking the mouth of the Mississippi River, and the Jean Lafitte National Historic Park and Preserve are in the MLRA. A number of national wildlife refuges and State parks occur throughout this area. MLRA 151 is a very complex ecosystem with active deltaic development and subsidence with extreme anthropogenic impact by man with construction of flood protection levees and channelization occurring on the eastern portion of the MLRA. The Western portion of the MLRA is more stable in that portions of the landscape is protected naturally by the Chenier's, although there is Anthropogenic affects of the interior due to channelization for navigation.

Classification relationships

Major Land Resource Area (MLRA) and Land Resource Unit (LRU) (USDA-Natural Resources Conservation Service, 2006)
The Natural Communities of Louisiana - (Louisiana Natural Heritage Program - Louisiana Department of Wildlife

and Fisheries)

Ecological site concept

These areas are on low gulf coastal brackish marshes at elevations of 1 foot or less. Slopes range from 0 to 0.1 percent. The soils formed in moderately thick herbaceous organic materials overlying fluid clayey or silty sediments. The unconsolidated brackish mineral and organic sediments are too soft for cattle to graze. These areas flood very frequently and frequently with salt water during high tides and remain ponded for very long duration. This is a brackish marsh site dominated by marshay cordgrass with lesser amounts of seashore saltgrass, and various sedges and rushes. Water level and salinity play a major roll in the secondary vegetation. The water salinity generally ranges from 5 to 15 ppt but will be much higher during storm tides or completely fresh during flooding. Also included in this site may be small areas of open water. The open water areas contain plants such as dwarf spikerush and Widgeongrass.

Associated sites

R151XY005LA	**Brackish Firm Mineral Marsh 55-64 PZ** The Brackish Mineral marsh site frequently occurs adjacent to the Brackish Firm Mineral Marsh

Similar sites

R151XY005LA	**Brackish Firm Mineral Marsh 55-64 PZ** Similar primary species composition and proportions on both sites. The firm site is potentially slightly more productive than the fluid site.
R151XY676TX	**INTERMEDIATE Fluid MARSH** Occurs in Texas counties immediately west of Louisiana and occupying a narrow strip of land along the entire Texas Gulf Coast. Similar plant species, but lower annual production due to less annual rainfall.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

These areas are on low gulf coastal brackish marshes at elevations of 1 foot or less. Slopes range from 0 to 0.1 percent. The soils formed in moderately thick herbaceous organic materials overlying fluid clayey or silty sediments. The unconsolidated brackish mineral and organic sediments are too soft for cattle to graze. These areas flood very frequently and frequently with salt water during high tides and remain ponded for very long duration.

Table 2. Representative physiographic features

Landforms	(1) Marsh (2) Delta plain
Flooding duration	Very long (more than 30 days)
Flooding frequency	Frequent to very frequent
Ponding duration	Very long (more than 30 days)
Ponding frequency	Frequent
Elevation	0–4 m
Slope	0%
Ponding depth	0–30 cm
Water table depth	0–15 cm

Aspect	S

Climatic features

The average annual precipitation is 60 to 65 inches. About 70 percent of the precipitation occurs during the growing season. Rainfall typically occurs as post-frontal precipitation in the winter and heat-convection showers and thunderstorms in the spring and summer. In addition, tropical storms can bring large amounts of rainfall. The freeze-free period averages 325 days and ranges from 290 to 365 dyas, increasing in length from north to south.

Table 3. Representative climatic features

Frost-free period (average)	365 days
Freeze-free period (average)	365 days
Precipitation total (average)	1,651 mm

Influencing water features

Marsh ecosystems are characterized by unique vegetative and hydrologic factors. Salinity, depth of water, duration of inundation, and slight differences in elevation determine the kinds of plants that can persist in marsh ecosystems. Several factors may affect salinity and/or water depth as well as duration of inundation:

Natural Factors:
•Upstream Hydrology – the duration of flooding is influenced by the volume of water discharged upstream (runoff) in the hydrologic unit. This may be a permanent or transient feature of the water regime.

•Tidal Exchange – all marsh ecosystems are affected to some degree by tidal exchange.

•Salinity – the amount of salt per unit volume of water is a limiting factor in determining which plants can persist in a marsh ecosystem. Measured in parts per thousand (ppt). Relatively few plants can tolerate prolonged exposure or inundation to waters with high salt concentrations. Salinity levels Salinity levels in the Brackish Fluid Mineral Marsh generally range from about 5 ppt to about 15 ppt with a mean of 8 ppt. This is approximately 23% of the salinity range that occurs in the Gulf of Mexico.

Human Induced Factors
•Navigation Enhancement – canals and realignment of natural water courses may have catastrophic effects on marsh ecosystems. These features can inject salt water into areas that previously had lower levels of salinity, and/or they may prolong salt water inundation. Navigation features are frequently deeper than previous natural hydrologic conduits. Salt water is heavier than fresh water and creates a salt water wedge below the fresher surface water in a canal or other navigation feature. In marshes near the Gulf of Mexico or adjacent natural water bodies, navigation features can alter the duration and salinity of tidal flux.

•Salt Water Sills or Barriers – these structural measures limit tidal flow. They are usually in a navigable stream or canal and are designed to limit the amount and/or duration of saline inundation.

•Water Control Structures – these structures are designed to maintain optimum water depth in a hydrologic or management unit. They may be used to manipulate water depth for wildlife, moderate salinity levels, and enhance vegetation management.

Soil features

Soils on this site include Bancker, Clovelly, Delcomb and Lafitte. The soils formed in moderately thick herbaceous organic materials overlying fluid clayey or silty sediments. The thickness or organic material ranges from 10 to 74 inches to the contact with fluid clays or silty clays. The herbaceous surface material is mainly sapric material, but hemic and fribric materials as woody peat or wood fragments occur as thin strata. The unconsolidated brackish mineral and organic sediments are too soft for cattle to graze. The n-values are generally greater than 1.0, but range from 0.7 to more than 1.0. These soils flood frequently and very frequently with brackish water during high tides.

Taxonomic Classification:
Bancker -Very-fine, smectitic, nonacid, hyperthermic Sodic Hydraquents
Clovelly -Clayey, smectitic, euic, hyperthermic Terric Haplosaprists
Delcomb -Loamy, mixed, euic, hyperthermic Terric Haplosaprists
Lafitte -Euic, hyperthermic Typic Haplosaprists

Table 4. Representative soil features

Surface texture	(1) Muck
Family particle size	(1) Clayey
Drainage class	Very poorly drained
Permeability class	Very slow
Soil depth	183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	17.78–33.02 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	4–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	5–15
Soil reaction (1:1 water) (0-101.6cm)	4.5–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The Brackish Fluid Mineral Marsh ecological site is a flat coastal plain that occurs along relict or existing rivers, bayous, and canals in the marsh. The soils are of recent geological origin. The site is continually saturated with brackish water which is at the soil surface or as much as 8 to 10 inches above the surface. During extremely dry periods, the site may not have any surface water at low tide, or may have as much as 3 feet of water during storm tides.

The vegetation consists almost entirely of grasses and grass-like plants. The vegetation is dominated by marshhay cordgrass with California bulrush, Olney bulrush, seashore paspalum , seashore saltgrass, other bulrush species, and various rushes and sedges being primary sub-dominant species. The Brackish Fluid Mineral Marsh is a dynamic ecosystem which changes constantly and sometimes rapidly as a result of natural environmental conditions and climatic events. Tidal exchange determines depth of water, duration of inundation, and salinity of surface and ponded water. These are all factors that influence the amount and kind of vegetation that is present in a selected state. Surface water salinity levels generally range from 5 ppt to 15 ppt, but will vary on the site throughout the year depending on rainfall and tides. These variations cause temporary shifts in kinds, amounts, and proportions of secondary vegetation from species that are typically associated with fresh marsh to those that are generally associated with more saline conditions. Roseau cane (common reed) occurs on this site in areas that are fresher or slightly elevated. Areas of open water are included within this site. These open water areas are very important to waterfowl and other wildlife.

Water control plans have been developed and implemented on a hydrologic unit basis in some areas. These plans include the use of water control structures that are designed to maintain constant water depth and salinity in order to support a desired plant community.

The site is subject to flooding from Gulf storms. Abnormally high tides that occasionally flood the site are the primary source of soil salinity. The extremely flat slopes and dense vegetation restrict water runoff. Reduced runoff, abundant rainfall, and low evapotranspiration cause the soil to be saturated to the surface most of the year. During the winter months, the soil may have up to 10 inches of water on the surface. During the summer months, increased evapotranspiration rates and higher temperatures may cause the water table to drop to 2 to 10 inches below the soil surface.

Some plant communities that are dominated by bunchgrasses may be susceptible to sheet erosion. Upright vegetation and the basal stools of these bunchgrasses do not dissipate the energy from tidal fluctuations. Water flow between the basal stools of these bunchgrasses washes away the soil, increases water depth, and jeopardizes the existence of the bunchgrass plant community.

Fire is primary tool for management of marsh ecosystems. In order for fire to play a beneficial role in marsh management, burning must be done in a prescribed manner. Burning should be done when there is at least 6 inches of water covering the marsh. This cushion of water protects the vegetative reproduction tissues of marsh plants. Fire is an excellent tool for removal of old growth to encourage vigorous high quality growth and enhance wildlife habitat.

Burning increases the quality of the vegetation and changes the structure of the plant community. This attracts geese and furbearers to the freshly burned areas. Wildlife grazing pressure presents a management challenge because it is not possible to consistently control the numbers and movements of most wildlife species. Burns should be sufficient in size to prevent destructive grazing (eatouts) by furbearers and geese. Elimination of fire from the ecosystem can result in an unhealthy plant community dominated by senescent vegetation and a loss of diversity.

Trafficability is severely restricted on this site because of the saturated soil conditions. The soils on this site are too soft to support livestock grazing. Cattle walkways have been constructed in some areas to provide cattle access for limited grazing on the edges of the site.

The Brackish Fluid Mineral Marsh plays a critical role in the life cycle of many species of estuarine wildlife such as shrimp, blue crab, and menhaden. Brackish marshes serve as nurseries for these species as they mature from the juvenile to the adolescent stage.

The marsh serves as a natural filtration system for the adjacent coastal waters. It captures sediments, waste, pollutants, and nutrients deposited from agricultural, urban, and industrial areas above the marsh. As upstream waters move through the marsh ecosystem, the continuous filtering action releases cleaner water into the Gulf of Mexico. Marsh sites function as nitrogen and phosphorous sinks, resulting in the improvement in the quality of water that passes through the site. It can serve as a buffer to modify the effects of storms. Marsh vegetation also stabilizes the shoreline and reduces erosion caused by tides, wave action, storms, and flooding.

The proximity to the Gulf of Mexico makes this site susceptible to degradation by several natural and human induced actions. Hurricanes and tropical storms can cause entire plant communities to be destroyed in a very short period of time. Constant wind action and low topographic relief make shoreline erosion a constant threat. Those areas with a long fetch of open water are especially vulnerable to wave action. Deepening of existing water bodies and/or dredging new access to canals can cause changes in water depth and increase salinity levels, which may affect marsh vegetation. This may lead to permanent loss of vegetation and eventually result in regression to open water.

State and Transitional Pathways:
The State and Transition Diagram which follows provides information on some of the most typical pathways that the vegetation on this site can follow as the result of natural events, management inputs, and application of

conservation treatments. There may be other plant communities that can exist on this site under certain conditions. Consultation with local experts and professionals is recommended prior to application of practices or management strategies in order to ensure that specific objectives will be met.

State and Transition Model Legend

1.1A – elimination of fire from the ecosystem
1.2A – prescribed burning during the correct season to benefit the desired vegetation.
T1A - increased depth of water, increased period of saturation or inundation
R2A – decreased depth of water, decreased period of saturation or inundation by installation of water control structures
T1B – increased salinity
R2B – decreased salinity levels by installation of water control structures
T2 – increased water depth, increased salinity levels, total inundation

State and transition model

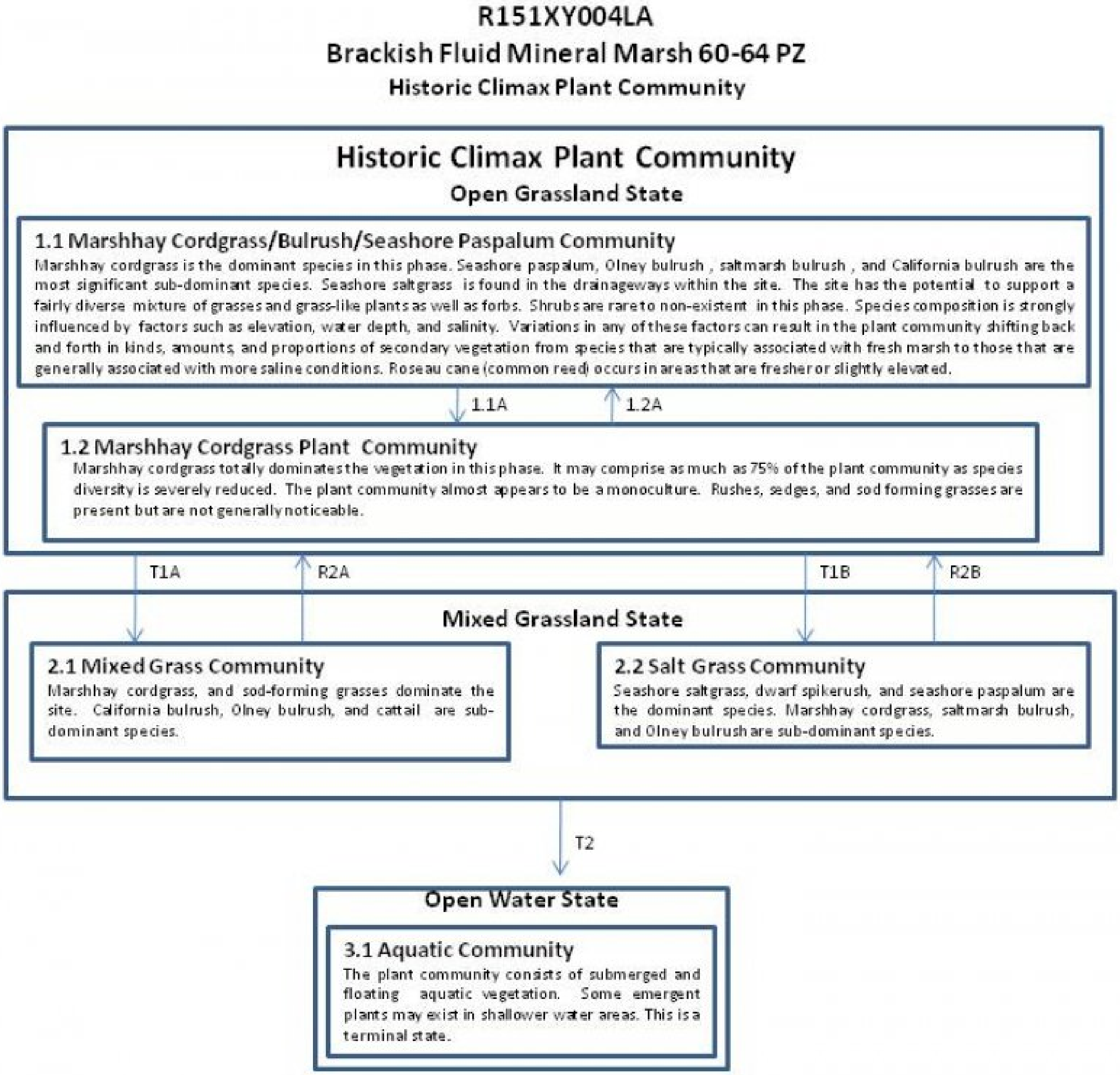

Figure 4. Brackish Fluid Mineral Marsh

State 1

Open Grassland

Community 1.1
Marshhay Cordgrass/Bulrush/Seashore Paspalum Plant Community

Figure 5. BFL1

The Brackish Fluid Mineral Marsh ecological site can potentially support a somewhat diverse mixture of grasses, grass-like plants, and forbs. Marshhay cordgrass is the dominant species in this plant community and is the plant that management considerations are based on. Marshhay cordgrass is typically found where salinity levels are between 3 and 9 ppt and water depth is up to 6 inches. Secondary herbaceous vegetation is directly influenced by factors such as elevation, water depth, and salinity. Variations in one or more of these factors can result in the plant community shifting back and forth from species that are typically associated with more saline conditions to species that are generally associated with fresh marsh. Seashore saltgrass is usually found in the small drainageways within the site. It can withstand more saline conditions and longer periods of inundation than marshhay cordgrass. Roseau cane (common reed) occurs in areas that are fresher or slightly elevated. Widgeongrass is a submerged aquatic species that is typically found in open water areas within the brackish marsh and is an excellent duck food. Olney bulrush (three-corner grass), big cordgrass, and seashore paspalum are other significant sub-dominant species. Roseau cane (common reed) occurs in areas that are fresher or slightly elevated. Widgeongrass is an aquatic species that is often found in open water areas within the marsh. Shrubs are rare to non-existent on this site in its pristine state, however a few widely scattered bigleaf sumpweed (marsh elder) may occur. Fire is a major management tool for this plant community. Without fire the accumulated rough of marshhay cordgrass not only suppresses other vegetation, but it can also reduce its own annual production because the old growth suppresses the potential for new, vigorous growth. Prescribed fire allows species such as dwarf spikerush and seashore saltgrass to increase both spatially and in biomass production.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	5044	12497	15131
Forb	560	841	1401
Shrub/Vine	–	–	112
Total	**5604**	**13338**	**16644**

Figure 7. Plant community growth curve (percent production by month). LA1511, Louisiana Gulf Coast Marshes. Fresh, Brackish, and Saline Marshes of the Louisiana Gulf Coast .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	13	23	25	10	7	5	5	5	2	1

Community 1.2
Marshhay Cordgrass Community

The absence of fire and/or grazing results in a plant community that is dominated by marshhay cordgrass to the almost total exclusion of other species. It may comprise 75% or more of the total vegetation. The almost complete foliar cover of marshhay cordgrass gives the area the appearance of a monoculture. Rushes, sedges, low-growing sod-forming grasses, a few forbs and scattered shrubs comprise the remainder of the vegetation in this phase. Seashore saltgrass is only present in the deeper internal drainageways on the site. These conditions make this plant community susceptible to erosion. Energy created by tidal fluctuations is not dampened and the ground cover only consists of the basal stools of marshhay cordgrass.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	6725	16813	22417
Shrub/Vine	–	–	–
Forb	–	–	–
Total	**6725**	**16813**	**22417**

Figure 9. Plant community growth curve (percent production by month). LA1511, Louisiana Gulf Coast Marshes. Fresh, Brackish, and Saline Marshes of the Louisiana Gulf Coast .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	13	23	25	10	7	5	5	5	2	1

State 2
Mixed Grassland State

Community 2.1
Mixed Grass Community

Figure 10. BFL2

Marsh plants exist in a delicate balance with water depth and salinity levels. When this balance is altered, the plant community adapts to the new regime. The mixed grass plant community is dominated by marshhay cordgrass. As depth of water increases and the period of saturation and/or inundation increases, the plant community becomes more diverse as marshhay cordgrass declines and sod-forming grasses increase on the site. California bulrush (bullwhip), Olney bulrush (three-corner grass), and cattails also increase. Seashore saltgrass and seashore paspalum occupy the drainageways within the site. As depth of water increases and the period of saturation and/or inundation increases, the plant community becomes more diverse as marshhay cordgrass declines and sod-forming grasses increase on the site. California bulrush (bullwhip), Olney bulrush (three-corner grass), and cattails are found in the fresher areas and deeper water areas of this site. As water depth increases, these species can develop extensive communities. When this regime persists, open water areas begin to appear between plants and may eventually cause marsh “breakup”. As marsh “breakup” occurs sheet erosion increases due to tidal flow. This increased erosion results in increased water depth and duration of inundation. Widgeongrass is an aquatic species which is often found in the open water areas where a water control plan has been implemented to control water depth and salinity. Small areas within this plant community may be severely overgrazed by geese or furbearers and eventually may develop into a sod-forming plant community rather than a bunchgrass plant community. This is especially true when uncontrolled grazing takes place immediately following a burn. Wildlife, such as geese and furbearers have been known to eliminate or severely reduce marshhay cordgrass from the site. As marshhay cordgrass and other bunchgrasses decline, sod-forming grasses such as seashore paspalum and seashore saltgrass become the dominant species on these areas. Dwarf spikerush is one of the earliest species to come in to the overutilized areas and bigleaf sumpweed and eastern baccharis may begin to increase noticeably.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2802	5604	6725
Forb	560	1121	2242
Shrub/Vine	–	–	–
Total	**3362**	**6725**	**8967**

Community 2.2
Salt Grass Community

As salinity increases, the less salt tolerant species begin to decline. If water depth remains constant, and uncontrolled grazing continues, marshay cordgrass is replaced by more salt tolerant species. Seashore saltgrass is more salt tolerant and can tolerate more intense grazing pressure. As a result, it increases significantly and becomes the dominant species. Dwarf spikerush, saltmarsh bulrush, and Olney bulrush increase initially. Smooth cordgrass may begin to appear on the fringes of the brackish marsh where salt concentrations are highest.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	3250	4820	6165
Forb	112	224	560
Shrub/Vine	–	–	–
Total	**3362**	**5044**	**6725**

Figure 13. Plant community growth curve (percent production by month). LA1511, Louisiana Gulf Coast Marshes. Fresh, Brackish, and Saline Marshes of the Louisiana Gulf Coast .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	13	23	25	10	7	5	5	5	2	1

State 3
Open Water

Community 3.1
Aquatic Community

Figure 14. BFL3

This is usually a terminal state due to the extreme cost and complexity of obtaining reclamation permits and the cost of installing water control structures. Once this site has reverted to open water, it is not generally economically feasible or practical for individual landowners to reclaim it with current technology. The plant community consists primarily of submerged and floating aquatic plants such as widgeongrass.

Transition A
State 1 to 2

Ecological process: Hydrologic Cycle Primary trigger: Increased depth of water, period of saturation or inundation Secondary Trigger: Indicator: Vegetative Species Change, increased water area

Transition B
State 1 to 2

Increased salinity.

Restoration pathway A
State 2 to 1

decreased depth of water, decreased period of saturation or inundation by installation of water control structures

Restoration pathway B
State 2 to 1

decreased salinity levels by installation of water control structures

Transition 2
State 2 to 3

Increased water depth, increased salinity levels, total inundation

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Grasses/Grasslike**			5604–22417	
	saltmeadow cordgrass	SPPA	*Spartina patens*	1121–17934	–
	California bulrush	SCCA11	*Schoenoplectus californicus*	0–7846	–
	seashore paspalum	PAVA	*Paspalum vaginatum*	560–4483	–
	chairmaker's bulrush	SCAM6	*Schoenoplectus americanus*	560–4483	–
	smooth cordgrass	SPAL	*Spartina alterniflora*	0–1121	–
	coast cockspur grass	ECWA	*Echinochloa walteri*	0–1121	–
	common reed	PHAU7	*Phragmites australis*	0–897	–
	saltgrass	DISP	*Distichlis spicata*	336–785	–
	seashore dropseed	SPVI3	*Sporobolus virginicus*	0–560	–
	softstem bulrush	SCTA2	*Schoenoplectus tabernaemontani*	0–448	–
	dwarf spikerush	ELPA5	*Eleocharis parvula*	112–224	–
	longtom	PADE24	*Paspalum denticulatum*	56–224	–
	big cordgrass	SPCY	*Spartina cynosuroides*	0–224	–
	fragrant flatsedge	CYOD	*Cyperus odoratus*	0–202	–
	common spikerush	ELPA3	*Eleocharis palustris*	0–112	–
3	**Aquatics**			0–112	
	widgeongrass	RUMA5	*Ruppia maritima*	0–112	–
Forb					
2	**Forbs**			0–2242	
	bulltongue arrowhead	SALA	*Sagittaria lancifolia*	0–1121	–
	alligatorweed	ALPH	*Alternanthera philoxeroides*	0–1121	–
	southern cattail	TYDO	*Typha domingensis*	0–841	–
	herb of grace	BAMO	*Bacopa monnieri*	0–168	–
	saltmarsh morning-glory	IPSA	*Ipomoea sagittata*	0–112	–
	Virginia saltmarsh mallow	KOVI	*Kosteletzkya virginica*	0–112	–
	wand lythrum	LYLI2	*Lythrum lineare*	0–112	–
Shrub/Vine					
4	**Shrubs**			0–112	
	Jesuit's bark	IVFR	*Iva frutescens*	0–112	–

Animal community

The Brackish Fluid Mineral Marsh provides good habitat for a variety of terrestrial and avian wildlife species because of the diversity of plant species composition and structure. Muskrats, geese, mink, otters, and raccoons are the most abundant species. Muskrats prefer areas where Olney bulrush, saltmarsh bulrush, marshhay cordgrass, and seashore saltgrass are some of the most preferred food plants for many of these species.

Other wildlife species which are found in moderate numbers include ducks, nutria, alligators, swamp rabbits, shore birds, song birds, coots and rails. Predators such as coyotes and bobcats are present on this site.

Migratory ducks arrive in the marsh in October, and stay though the winter until late March before returning to the North. Geese prefer to feed in open areas with very short, tender vegetation. They eat the roots, tubers, and tender leaf growth of plants. Recently burned areas are favored feeding grounds for geese. After heavy grazing by geese, these areas are heavily disturbed and often denuded.

Trafficability is severely restricted on this site because of the saturated soil conditions. The soils on this site are too soft to support livestock grazing. Cattle walkways have been constructed in some areas to provide cattle access for limited grazing on the edges of the site.

Hydrological functions

The hydrology of the brackish marsh ecosystem is dominated by tidal exchange with the Gulf of Mexico. Historically, the hydrologic head of natural rivers and bayous, buffered tidal flow to inland marshes.

Waterways such as canals, trapper ditches, and property line ditches, have been developed to gain access to and within inland marshes which were not accessible by natural riverine systems. The development of deepwater navigation canals, as well as the deepening and realignment of natural riverine systems has also provided a conduit for salt water into previously fresher marsh ecosystems.

Geologic subsidence is another major factor in salt water intrusion into fresher marshes. Many of the navigation features that have been installed restrict overbank flow of sediment during periods of high fresh water flow. These sediments help offset the effects of geologic subsidence.

Duration of tidal inundation is also affected by these geologic and human activities. During periods of low fresh water flow, tidal inundation overpowers fresh water head, and saltwater enters previously fresher marsh ecosystems. Tidal salt water inundation results in the die-off of less salt tolerant plant species. The loss of these plants and their root systems leads to soil loss, and result in the area becoming open water. The hydrologic function of tidal fluctuation is a determining factor in brackish marsh ecosystems.

Recreational uses

Hunting, camping, boating, tourism, and bird watching offer recreational opportunities for the public as well as economic opportunities for landowners in the marsh. Duck and goose hunting are prevalent in this area. The marsh sites are preferred areas for resident and migratory waterfowl, songbirds, shore birds, and wading birds. Hunting and fishing camps are common in the marsh. There are many state and national wildlife refuges in the marsh. Commercial enterprises offer air boat excursions and marsh tours, and sightseeing in some areas. Recreational boating, fishing, and crabbing are common activities in adjacent water bodies. In recent years, bird watching has become increasingly popular with the public. Bird watching potential can be enhanced by constructing observation platforms, boardwalks, etc. to provide access for visitors.

Other products

Trappers often use marsh sites to harvest mammals which are valued for their pelts. The marsh provides habitat for numerous furbearers such as muskrats, raccoons, minks, otters, bobcats, and coyotes. Nutria are trapped and harvested as a food source for alligators being produced on alligator farms.

Alligators are harvested for their hides and meat. Alligator eggs are removed from their nests and provided to alligator farms where the eggs are hatched and alligators are produced commercially.

The Brackish Fluid Mineral Marsh plays a critical role in the life cycle of many species of estuarine wildlife. They serve as nurseries for these species as they mature from the juvenile to the adolescent stage. Marsh vegetation produces large amounts of detritus which provides food and shelter for numerous aquatic organisms. Phytoplankton production in the nutrient rich estuaries provides the basis for the Gulf Coast fishing industry. Smooth cordgrass colonies trap sediments and nutrients and provide nursery areas for the juvenile and larval forms of numerous species of fish and crustaceans including shrimp, crab, oysters, crawfish, menhaden, croaker, bay anchovy, drum, flounder, seatrout, and other species.

Inventory data references

Production and Composition Data for Native Grazing Lands (SCS-RANGE-417) clipping data was reviewed to determine species occurrence and production on soils that are representative of the Brackish Fluid Mineral Marsh ecological site. In addition vegetation transect data from Cameron, and Vermillion Parishes collected from 1991-1995 was used to determine species occurrence and production on typical Brackish Fluid Mineral Marsh ecological sites.

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not**

bare ground):

---

5. **Number of gullies and erosion associated with gullies:**

---

6. **Extent of wind scoured, blowouts and/or depositional areas:**

---

7. **Amount of litter movement (describe size and distance expected to travel):**

---

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

---

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

---

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

---

14. **Average percent litter cover (%) and depth (in):**

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**