USDA Natural Resources Conservation Service

Ecological site R151XY005LA
Brackish Firm Mineral Marsh 55-64 PZ

Accessed: 05/11/2025

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 3 feet or less. Slopes range from 0.1 to 0.5 percent. The soils formed in unconsolidated fluid clayey coastal sediments or thin accumulations of herbaceous plant remains and semi-fluid clayey alluvium over consolidated clayey deposits or submerged soils formed in prairie aged loess-like deposits. The unconsolidated sediments are firm enough for cattle to graze. These areas flood frequently with fresh or brackish water during high tides and remain ponded for very long duration. Marshhay cordgrass and/or seashore saltgrass dominate this site. Saltmarsh bulrush and needlegrass rush are also found in smaller amounts. Elevation, drainage, and salinity play a major role in the kinds and amounts of secondary vegetation that occur on this site. Small areas of open water are also included. These areas are important to waterfowl and other wildlife because of habitat diversity. Surface water salinity levels vary during the year depending on rainfall and tides. This causes temporary shifts from intermediate marsh to brackish marsh vegetative types. Fresher water and slightly higher elevated parts of the site are indicated by the presence of common reed.

Associated sites

R151XY002LA	**Saline Marsh 55-64 PZ** The Saline Marsh Site has less trafficable soils and more Saline tolerant species composition.
R151XY012LA	**Saline Firm Marsh 55-64** The Saline Firm Site has more Saline tolerant species composition.
R151XY677TX	**Saline Fluid Marsh 42+ PZ** The Saline Fluid Site has less trafficable soils and more Saline tolerant species composition.

Similar sites

R151XY004LA	**Brackish Fluid Marsh 60-64 PZ** The Brackish Fluid Site has less trafficable soils although species composition will be very similar.

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 3 feet or less. Slopes range from 0.1 to 0.5 percent. The soils formed in unconsolidated fluid clayey coastal sediments or thin accumulations of herbaceous plant remains and semi-fluid clayey alluvium over consolidated clayey deposits or submerged soils formed in prairie aged loess-like deposits. The unconsolidated sediments are firm enough for cattle to graze. These areas flood frequently with fresh or brackish 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
Ponding duration	Very long (more than 30 days)
Ponding frequency	Frequent
Elevation	0–40 ft
Slope	0–1%

Ponding depth	0–12 in
Water table depth	0–24 in
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)	65 in

Influencing water features

Marsh ecosystems are characterized by unique vegetative and hydrologic factors. Salinity, depth of water, and duration of inundation 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. It is most evident in saline marshes because the presence or absence of water is obvious. At low tide, salts tend to crystallize on the soil surface where tidal flux is not ponded.

•Salinity – the amount of salt per unit volume of water is a limiting factor in determining which plants that can persist in a marsh ecosystem. Relatively few plants can tolerate prolonged exposure or inundation to waters with high salt concentrations.

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 Andry, Creole, Gentilly and saline phases of Fausse. The soils formed in unconsolidated fluid clayey coastal sediments or thin accumulations of herbaceous plant remains and semi-fluid clayey alluvium over consolidated clayey deposits or submerged soils formed in prairie aged loess-like deposits. The thickness of

organic material ranges from 0 to 10 inches to the contact with fluid clays or silty clays. The herbaceous surface material is mainly hemic and sapric material, but fribric materials as woody peat or wood fragments occur as thin strata. The unconsolidated brackish mineral and organic sediments are soft on the surface but become firm at shallow enough depths to support cattle for grazing. The n-values are generally less than 0.7 at 10 to 40 inches below the surface, but range to 1.0. These soils flood frequently with fresh and brackish water during high tides.

Taxonomic Classification:
Andry - Fine-silty, mixed, superactive, thermic Typic Argiaquolls
Creole - Fine, smectitic, nonacid, hyperthermic Typic Hydraquents
Fausse - Very-fine, smectitic, nonacid, hyperthermic Vertic Endoaquepts
Gentilly - Fine, smectitic, hyperthermic Typic Hydraquents

Table 4. Representative soil features

Surface texture	(1) Muck
Family particle size	(1) Clayey
Drainage class	Very poorly drained
Permeability class	Slow
Soil depth	72 in
Available water capacity (0-40in)	5–8 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	4–16 mmhos/cm
Sodium adsorption ratio (0-40in)	5–20
Soil reaction (1:1 water) (0-40in)	4.5–9

Ecological dynamics

The Brackish Firm Mineral Marsh ecological site is a level to slightly concave coastal marsh with elevations ranging from 1 to 4 feet above sea level, and includes small, shallow depressions in many areas. Soils are of recent geological origin. The vegetation consists primarily of grasses and grass-like plants. The site is dominated by marshhay cordgrass with seashore saltgrass and seashore paspalum as the most significant sub-dominant species. The Brackish Firm 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
on 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 3 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 and grazing are also factors that affect plant composition and production. Elimination of fire from the ecosystem can result in an unhealthy plant community dominated by senescent vegetation and a loss of plant diversity. Grazing by cattle, furbearers, and geese can adversely affect vegetation on this site if not properly managed. Uncontrolled grazing may result in the decline or elimination of historic vegetation which is replaced by more aggressive and competitive species.

Fire is the primary tool for management of marsh ecosystems. Burning should be done when there is at least six (6) inches of water covering the marsh. This cushion of water protects the vegetative reproduction tissues of marsh plants. Fire is used to remove old growth, encourage vigorous new growth, enhance wildlife habitat, and improve forage quality and production potential. Burning also changes the structure of the plant community which can be beneficial to many wildlife species.

Cattle, geese, and furbearers are attracted to the high quality vegetation on 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.

In order to maintain or improve the plant community, livestock grazing must be managed by implementing a planned grazing system. Sustainable stocking rates are the primary factor to consider. Grazing management can be enhanced by manipulation of the time, frequency, intensity, and duration of grazing.

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,
followed by prescribed grazing if livestock are present

T1A – uncontrolled grazing

T1B - increased depth of water, increased period of saturation or inundation

R3A – decreased depth of water, decreased period of saturation or inundation by installation of water control structures

T1C – increased salinity, uncontrolled grazing

R3B – decreased salinity levels by installation of water control structures, followed by prescribed grazing

3.1A – increased salinity, uncontrolled grazing

3.2A – decreased salinity levels by installation of water control structures, followed by prescribed grazing

T2A – abusive grazing

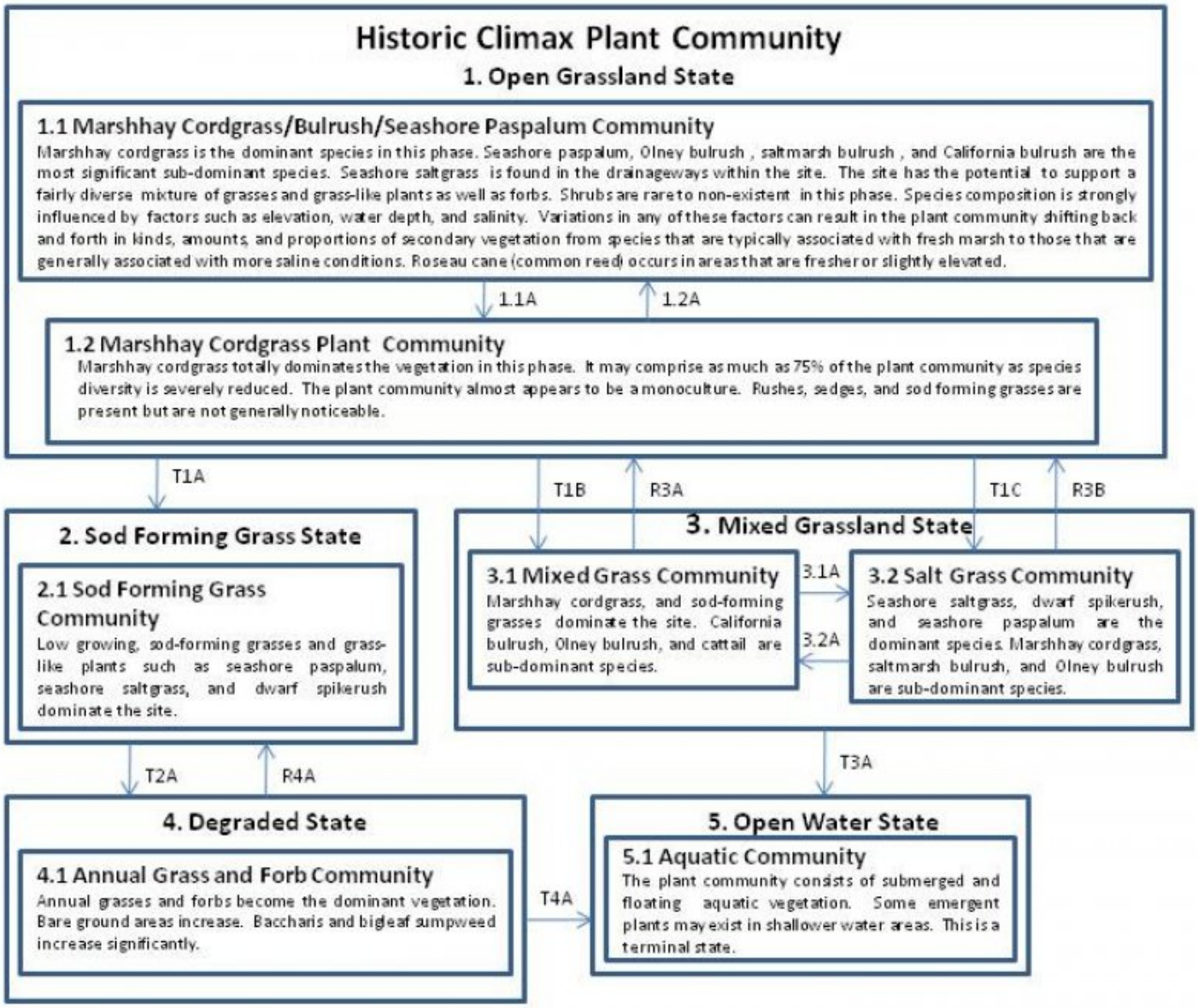
R4 – prescribed burning during the correct season to benefit the desired vegetation, followed by prescribed grazing if livestock are present

T3A – increased water depth, total inundation, increased salinity levels

T4A – increased water depth, total inundation, increased salinity levels

State and transition model

R151XY005LA
Brackish Firm Mineral Marsh 60-64 PZ



State 1
Open Grassland

Community 1.1
Marshhay Cordgrass/Bulrush/Seashore Paspalum Community

Figure 4. Marshhay Cord/Seashore Paspalum

The Brackish Firm 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 paspalum, Olney bulrush (three-corner grass), saltmarsh bulrush (leafy three-square) and California bulrush (bullwhip) are the most significant sub-dominant species. 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. Low growing and sod-forming grasses and grass-like plants such as dwarf spikerush, and fragrant flatsedge are minor components of this plant community. Roseau cane (common reed) occurs in areas that are fresher or slightly elevated. The primary forbs found on this site are cattail, saltmarsh morningglory, and saltmarsh mallow. Widgeongrass is a submerged aquatic species that is typically found in open water areas within the brackish marsh and is an excellent duck food. Shrubs are rare to non-existent on this site in its pristine state, however a few widely scattered shrubs may occur. Those shrubby species may include bigleaf sumpweed (marsh elder), eastern baccharis, and wolfberry. Fire is a major mangaement 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 (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	4500	11150	13500
Forb	500	750	1250
Shrub/Vine	10	100	250
Total	**5010**	**12000**	**15000**

Figure 6. 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

Figure 7. Marshhay Cordgrass

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% of 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.

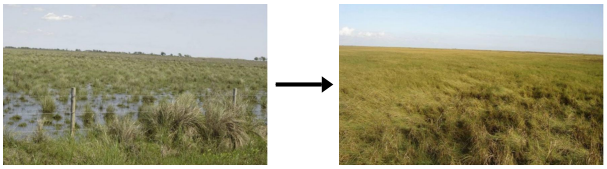
Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	6000	15000	20000
Total	**6000**	**15000**	**20000**

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

Pathway A
Community 1.1 to 1.2

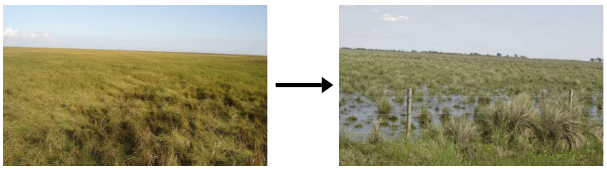


Marshhay Cordgrass/Bulrush/Seashore Paspalum Community

Marshhay cordgrass Community

elimination of fire from the ecosystem

Pathway B
Community 1.2 to 1.1



Marshhay cordgrass Community

Marshhay Cordgrass/Bulrush/Seashore Paspalum Community

prescribed burning during the correct season to benefit the desired vegetation, followed by prescribed grazing if livestock are present

State 2
Sod Forming Grass State

Community 2.1
Sod Forming Grass Community

Figure 10. Sod Forming Grasses

Uncontrolled grazing by cattle and wildlife can result in 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 severly 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. Dwarf spikerush is one of the earliest species to come into the overutilized brackish marshes. Bigleaf sumpweed and eastern baccharis begin to increase noticeably. Once the site has deteriorated to this state, it is highly unlikely that it can ever return to the previous state through management alone. This is because of the intense competition from the sod-forming grasses.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2000	8100	9500
Forb	200	750	2500
Shrub/Vine	500	500	1000
Total	**2700**	**9350**	**13000**

Figure 12. 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
Mixed Grassland State

Community 3.1
Mixed Grass Community

Figure 13. Mixed Grassland

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. 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 impemented to control water depth and salinity.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2500	5000	6000
Forb	500	1000	2000
Total	**3000**	**6000**	**8000**

Community 3.2
Salt Grass Community

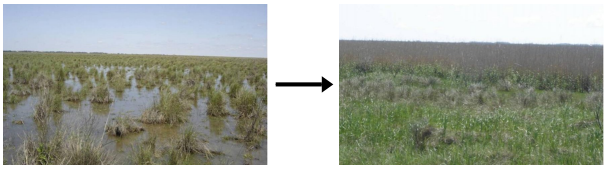
Figure 15. Salt Grass Community

As salinity increases, the less salt tolerant species begin to decline. If water depth remains constant, and uncontrolled grazing continues, marshhay 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. Spikerush, saltmarsh bulrush, and Olney bulrush increase initially, however, grazing pressure will prevent them from becoming dominant. Smooth cordgrass may begin to appear on the fringes of the brackish marsh where salt concentrations are highest.

Table 9. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2900	4300	5500
Forb	100	200	500
Total	**3000**	**4500**	**6000**

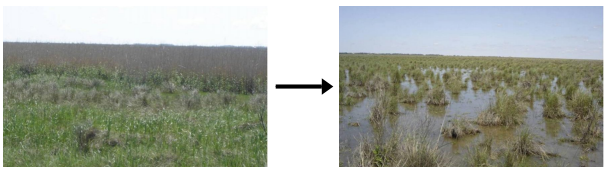
Pathway A
Community 3.1 to 3.2



Mixed Grass Community **Salt Grass Community**

increased salinity, uncontrolled grazing

Pathway B
Community 3.2 to 3.1



Salt Grass Community **Mixed Grass Community**

decreased salinity levels by installation of water control structures, followed by prescribed grazing

State 4
Degraded State

Community 4.1
Annual Grass and Forb State

Figure 17. Annual Grass and Forb

This plant community occurs where there has been abusive grazing by cattle or wildlife. These areas are locally known as "eat outs". In the most extreme cases, virtually all perennial plants are grazed out, and often even the roots are consumed. These areas often have the appearance of being plowed. The resulting bare ground allows the site to be invaded by unwanted plant species. Bigleaf sumpweed and eastern baccharis are early invaders. Fire must be closely monitored to minimize intense grazing pressure when trying to restore this area to a higher state. Geese and furbearers concentrate on areas that have been recently burned. Excessive and/or abusive grazing by furbearers, geese, or cattle eventually result in a severly degraded plant community characterized by annual grasses and forbs, lower successional perennial grasses and forbs, and a significant increase in shrubs such as baccharis and bigleaf sumpweed.

Table 10. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	300	600	1250
Shrub/Vine	100	250	500
Forb	100	150	250
Total	**500**	**1000**	**2000**

State 5
Open Water State

Community 5.1
Aquatic Community

Figure 19. Aquatic Community

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 generally not 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. Some emergent plants may exist in shallower water areas.

Transition A
State 1 to 2

uncontrolled grazing

Transition B
State 1 to 3

increased depth of water, increased period of saturation or inundation

Transition C
State 1 to 3

increased salinity, uncontrolled grazing

Transition A
State 2 to 4

abusive grazing

Restoration pathway A
State 3 to 1

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

Restoration pathway B
State 3 to 1

decreased salinity levels by installation of water control structures, followed by prescribed grazing

Transition A
State 3 to 5

increased water depth, total inundation, increased salinity levels

Restoration pathway A
State 4 to 2

prescribed burning during the correct season to benefit the desired vegetation, followed by prescribed grazing if livestock are present

Transition A
State 4 to 5

increased water depth, total inundation, increased salinity levels

Additional community tables

Table 11. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Grasses**			5000–13500	
	saltmeadow cordgrass	SPPA	*Spartina patens*	1000–16000	–
	California bulrush	SCCA11	*Schoenoplectus californicus*	0–6000	–
	seashore paspalum	PAVA	*Paspalum vaginatum*	500–4000	–
	chairmaker's bulrush	SCAM6	*Schoenoplectus americanus*	500–4000	–
	coast cockspur grass	ECWA	*Echinochloa walteri*	0–1800	–
	smooth cordgrass	SPAL	*Spartina alterniflora*	0–1500	–
	seashore dropseed	SPVI3	*Sporobolus virginicus*	0–1200	–
	common reed	PHAU7	*Phragmites australis*	0–800	–
	saltgrass	DISP	*Distichlis spicata*	300–700	–
	dwarf spikerush	ELPA5	*Eleocharis parvula*	100–200	–
	longtom	PADE24	*Paspalum denticulatum*	0–200	–
	big cordgrass	SPCY	*Spartina cynosuroides*	0–200	–
	fragrant flatsedge	CYOD	*Cyperus odoratus*	0–180	–
	common spikerush	ELPA3	*Eleocharis palustris*	0–100	–
	widgeongrass	RUMA5	*Ruppia maritima*	0–100	–
Forb					
2	**Forbs**			0–2000	
	alligatorweed	ALPH	*Alternanthera philoxeroides*	0–1000	–
	southern cattail	TYDO	*Typha domingensis*	0–500	–
	herb of grace	BAMO	*Bacopa monnieri*	0–200	–
	saltmarsh morning-glory	IPSA	*Ipomoea sagittata*	0–100	–
	Virginia saltmarsh mallow	KOVI	*Kosteletzkya virginica*	0–100	–
	wand lythrum	LYLI2	*Lythrum lineare*	0–100	–
Shrub/Vine					
3	**Shrubs**			0–100	
	eastern baccharis	BAHA	*Baccharis halimifolia*	0–100	–
	Jesuit's bark	IVFR	*Iva frutescens*	0–100	–
	Carolina desert-thorn	LYCA2	*Lycium carolinianum*	0–50	–

Table 12. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)

Animal community

The Brackish Firm 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.

Cattle are grazed in the Brackish Firm Mineral Marsh. Marsh cattle are often subjected to harsh and strenuous conditions. Insects, disease, standing water, submerged grazing areas, unstable and boggy soil conditions, extremely warm temperatures and high humidity, lack of shelter and fresh drinking water sources present unique challenges to cattle grazing in the marsh.

During the summer months, heavy infestations of mosquitoes and deer flies cause discomfort and stress for cattle, and can lead to serious health problems. In the most extreme situations mosquitoes can kill cattle, and are especially hazardous to newborn calves. Seasonal grazing is the normal practice. Most cattle are usually moved into the marsh in late October or early November and moved to intensively managed pasturelands or fresher marsh sites by the end of May.

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.

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.

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

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 Firm Mineral Marsh ecological site. In addition vegetation transect data from Lafourche, Terrebonne, Cameron, and Vermillion Parishes collected from 1991-1995 was used to determine species occurrence and production on typical Bracksih Firm Mineral Marsh ecological sites.

Other references

•Allen, Dr. Charles, Dawn Allen Newman, and Dr. Harry Winters. Grasses of Louisiana, 3rd Edition. Allen’s Native Ventures. Pitkin, LA. 2004.

•Ball, D.M., C.S. Hoveland, and G.D. Lacefield. Southern Forages, Third Edition. Potash and Phosphate Institute and Foundation for Agronomic Research. Norcross, GA. 2002.

•Brown, Clair A. Wildflowers of Louisiana and Adjoining States. Louisiana State University Press. Baton Rouge, LA. 1991.

•Chabreck, Robert H. and R.E. Condrey. Common Vascular Plants of the Louisiana Marsh. Sea Grant Publication No. LSU-T-79-003. Louisiana State University Center for Wetland Resources. Baton Rouge, LA. 1979.

•Chabreck, Robert H. Vegetation, Water and Soil Characteristics of the Louisiana Coastal Region. Bulletin 664. Louisiana State University. Baton Rouge, LA. 1972.

•Cutshall, Jack R. Vegetation Establishment of Smooth Cordgrass (Spartna alterniflora) for Shoreline Erosion Control. Soil Conservation Service, Alexandria, LA. 1984.

•Daigle, Jerry, et. al. Ecoregions of Louisiana. Interagency map and descriptions. US EPA, USDA NRCS, and USGS.

•Louisiana Department of Wildlife and Fisheries. The Natural Communities of Louisiana. Louisiana Natural Heritage Program. LDWF. Baton Rouge, LA. 2004

•Post, Lauren C. The Old Cattle Industry of Southwest Louisiana. The McNeese Review. Volume 9. 1957.

•Radford, Albert E., Harry E. Ahles and C. Ritchie Bell. Manual of the Vascular Flora of the Carolinas. The

University of north Carolina Press. Chapel Hill, NC. 1987

•Southeast Texas Resource Conservation and Development Sponsors. Southeast Texas Resource Conservation and Development, Inc. Coastal Marsh Management–Southeast Texas.

•Stutzenbaker, Charles D. Aquatic and Wetland Plants of the Western Gulf Coast. Texas Parks and Wildlife Department, Wildlife Division. Austin, TX. 1999.

•Tarver, David P., John A. Rodgers, Michael J. Mahler, and Robert L. Lazor. Aquatic and Wetland Plants of Florida Second Edition. Bureau of Aquatic Plant Research and Control. Florida Department of Natural Resources. 1979.

•Thomas, R. Dale & Charles M. Allen. Atlas of the Vascular Flora of Louisiana, Vol.I: Ferns & Fern Allies, Conifers, & Monocotyledons. Louisiana Department of Wildlife & Fisheries Natural Heritage Program and The Nature Conservancy. Baton Rouge, LA. 1993.

•Thomas, R. Dale & Charles M. Allen. Atlas of the Vascular Flora of Louisiana, Vol.II: Dicotyledons, Acanthaceae – Euphorbiaceae. Louisiana Department of Wildlife & Fisheries Natural Heritage Program and The Nature Conservancy. Baton Rouge, LA. 1996.

•Thomas, R. Dale & Charles M. Allen. Atlas of the Vascular Flora of Louisiana, Vol.III: Dicotyledons, Fabaceae – Zygophyllaceae. Louisiana Department of Wildlife & Fisheries Natural Heritage Program and The Nature Conservancy. Baton Rouge, LA. 1998.

•United States Department of Agriculture Natural Resources Conservation Service. The PLANTS Database http://plants.usda.gov. USDA NRCS National Plant Data Center. Baton Rouge, LA. 2008.

•United States Department of Agriculture Natural Resources Conservation Service. Cameron-Creole Watershed 2003 Vegetative Monitoring Report. USDA NRCS. Alexandria, LA. 2007.

•United States Department of Agriculture Natural Resources Conservation Service. Ag Handbook 296. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. USDA NRCS Soil Survey Division. Washington, DC. 2006.

•United States Department of Agriculture Natural Resources Conservation Service. Ecological site Description Fluid Saline Marsh 42+” PZ. R151XY677TX. USDA NRCS. Temple, TX.

•Production and Composition Record for Native Grazing Lands. SCS-RANGE-417 data from Cameron, Vermillion, Iberia, St. Mary, Terrebonne, and La Fourche Parishes. 1981-1986.

•United States Department of Agriculture Natural Resources Conservation Service. Published Soil Surveys from Cameron, Vermillion, Iberia, St. Mary, Terrebonne, and La Fourche Parishes. Various publication dates.

•United States Department of Agriculture Natural Resources Conservation Service. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app. USDA NRCS Soil Survey Division. Washington, DC. 2008.

•United States Department of Agriculture Soil Conservation Service. Louisiana Wetlands Plant List. USDA SCS Louisiana Bulletin No. 190-7-3. USDA SCS. Alexandria, LA. 1986.

•United States Department of Agriculture Soil Conservation Service. Range Site Descriptions for the Gulf Coast Marsh Major Land Resource Area 151. USDA SCS. Alexandria, LA. Various publication dates.

•United States Department of Agriculture Soil Conservation Service. Submerged and Floating Aquatic Plants of South Louisiana. Alexandria, LA. 1988.

•United States Department of Agriculture Soil Conservation Service. Marshland Vegetation for Waterfowl and Furbearers. Alexandria, LA. 1988.

•United States Department of Agriculture Soil Conservation Service. Southern Wetland Flora. USDA SCS South

National Technical Center, Fort Worth, TX.

•United States Department of Agriculture Soil Conservation Service. Louisiana's Native Ranges and Their Proper Use. USDA SCS. Alexandria, LA. 1982.

•United States Department of Agriculture Soil Conservation Service. Gulf Coast Wetlands Handbook. USDA SCS. Alexandria, LA. 1977.

•United States Department of Agriculture Soil Conservation Service. 100 Native Forage Grasses in 11 Southern States. Agriculture Handbook 389. 1971

•United States Department of Agriculture Soil Conservation Service. Louisiana Range Handbook. USDA SCS. Alexandria, LA. 1956.

•United States Department of Agriculture Soil Conservation Service. Results of Plant Analyses From Samples Sent In During 1950 (Louisiana). USDA Soil Conservation Service Operations Laboratory. Soil Conservation Service. Fort Worth, TX. 1951.

•United States Department of Interior Fish and Wildlife Service. Classification of Wetlands and Deepwater Habitats of the United States. USDI FWS. Washington, DC. 1979.

•United States Department of Interior Fish and Wildlife Service. National List of Plant Species That Occur In Wetlands: Southeast Region (Region 2). USDI FWS Biological Report 88. Washington, DC. 1988.

•Yarlett, Lewis A. Common Grasses of Florida and the Southeast. The Florida Native Plant Society. Spring Hill, FL. 1996.

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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.

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Approval date	

Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** N/A

2. **Presence of water flow patterns:** N/A

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect less than 20% bare ground

5. **Number of gullies and erosion associated with gullies:** N/A

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

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

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

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** 0-3 inche dark gray mucky clay, 3-48 inches very dark gray to gray clay, 48-52 inches gray loamy fine sand, 52-80 inches gray caly loam to gray clay.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** N/A Soil saturated most of the time.

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

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: Warm-season grasses and grass-likes

Sub-dominant: Sod forming grasses

Other: Shrubs

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Perennial grasses will naturally exhibit a minor amount (less than 5%) of senescence and some mortality every year

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14. **Average percent litter cover (%) and depth (in):** 0-10% at a depth of less than 1 inch

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 5,000 to 20,000 pounds per acre

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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:** annual grasses and forbs, eastern baccharis, bigleaf sumpweed, wolfberry

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17. **Perennial plant reproductive capability:** All perennial species should be capable of reproducing every year unless disrupted by catastrophic events occuring immediately prior to, or during the reproductive phase.
