Ecological site R151XY011LA
Saline Sandy Ridge 55-64 PZ

Accessed: 04/27/2024

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

The Saline Sandy Ridge ecological sites are on low areas adjacent to gulf coastal beaches mainly at elevations of 5 foot or less. Slopes range from 0 to 3 percent. The soils formed in sandy coastal sediments. These areas flood rarely to frequently with salt water during storm tides.

Associated sites

R151XY002LA	**Saline Marsh 55-64 PZ** Saline Mineral Marsh occurs adjacent to the Saline Sandy Ridge site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

The Saline Sandy Ridge ecological sites are on low areas adjacent to gulf coastal beaches mainly at elevations of 5 foot or less. Slopes range from 0 to 3 percent. The soils formed in sandy coastal sediments. These areas flood rarely to frequently with salt water during storm tides.

Table 2. Representative physiographic features

Landforms	(1) Marsh (2) Beach ridge
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Rare to frequent
Elevation	0–5 ft
Slope	0–3%
Ponding depth	0 in
Water table depth	24–36 in

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

The Gulf of Mexico is the influencing water feature on this site. The barrier islands are surrounded by Gulf waters, and the beaches and dunes are subject to constant tidal activity. Daily tidal flux, storm surges, and onshore currents

all affect the physical state of the site as well as the kinds, proportions, and amounts of vegetation that exist at any point in time.

This site can exist in numerous phases depending upon the recency and severity of Gulf storm events.

Soil features

The dominant soil on this site is Felicity. These areas are on low areas adjacent to gulf coastal beaches mainly at elevations of 5 foot or less. Slopes range from 0 to 3 percent. The soils formed in sandy coastal sediments. These areas flood rarely to frequently with salt water during storm tides.

Taxonomic Classification: Felicity: Mixed, hyperthermic Aquic Udipsmments

Table 4. Representative soil features

Surface texture	(1) Loamy fine sand (2) Loamy sand (3) Fine sand
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained
Permeability class	Very rapid
Soil depth	72 in
Surface fragment cover <=3"	0–15%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	1.2–2.4 in
Calcium carbonate equivalent (0-40in)	10–30%
Electrical conductivity (0-40in)	8–16 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The Saline Sandy Ridge Ecological Site is a site composed of recently deposited sandy parent materials from the Gulf of Mexico. It occurs as beaches and dunes along the coastline, and as barrier islands off of the southeastern coast of Louisiana. This is a dynamic and continuously evolving site that may exist in various phases of development and vegetative establishment at any point in time. Tidal activity, storm surge, and wind energy are the dominant factors in the ecological dynamics of this site.

As wind and tidal energy dissipate, the open waters of the Gulf deposit sands in shallower, calmer waters on the shoreline. The sandy parent material is trapped by obstacles such as shells, debris, vegetation, and artificial barriers. Beaches begin to build.
In some locations, artificial measures have been installed to reduce the effects of wind and tidal energy. Breakwaters can be installed to buffer tidal action. Fences, sandbags, and other barriers can be used to trap sand. As wind and wave energy are reduced, sands are deposited and vegetation may begin to establish.

Wind energy moves dried sand particles further inland from the shoreline and beach to form low ridges or dunes. These ridges are typically less than 3 feet above mean high tide. The site is saline and is naturally droughty above the intertidal zone. The vegetation on this site is constantly subjected to powerful natural forces. Plants must be able to establish and persist in these harsh conditions.

The combination of wind and wave energy can both create and destroy this site. Wind energy can blow loose sands and deposit them on adjacent marsh sites or open water areas, completely covering existing vegetation and/or filling up shallow water areas. Storm tides can totally engulf the site and move parent material further inland to adjacent sites. Hurricanes and storm tides can destroy the vegetation, wash away the beaches and dunes, and completely inundate the site with salt water. This site is in constant peril of reverting to open waters of the Gulf of Mexico.

Human activities often have major negative impacts on this site because it is a preferred area for recreation. Off-road motorized vehicles can be particularly destructive on coastal dunes and beaches. Due to their isolation, the barrier islands are practically undisturbed by human activity. However, they are subject to frequent and drastic natural disturbances resulting from the strong wave and wind energy of the Gulf of Mexico.

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.

Legend for State & Transition Model

1.1A – The mixedgrass plant community establishes from seeds deposited by birds or wind, and vegetative materials from adjacent dunes.

1.1B – Excessive storm tides and windblown sand deposits can inundate the site with water, cover vegetation with sand, and increase salinity. This may cause the mixedgrass plant community to revert to a sod-forming grass community.

T1A – Overwash from tidal activity deposits additional soil materials and salt water. Black mangrove and smooth cordgrass totally dominate the plant community.

T1B – Hurricanes and extreme tidal activity can destroy existing vegetation, wash away dunes and beaches, and inundate the site permanently.

T2A – On barrier islands, storm surges can drown the vegetation and wash away sand. In extreme instances, the barrier island may disappear and become open water in the Gulf of Mexico.

T2B – Repeated overwash events on the beaches and dunes of the coastline cover the smooth cordgrass and the pneumataphores of the black mangrove with water and mud. This can completely kill out the existing vegetation. These overwash events deposit mixed soil materials . As the mudbanks begin to dry out, new plants begin
to establish. The mixed soil materials, altered salinity levels, and new vegetation can transform the Saline Sandy Ridge Ecological Site into a completely different ecological site…the Saline Mineral Marsh Ecological Site.

State and transition model

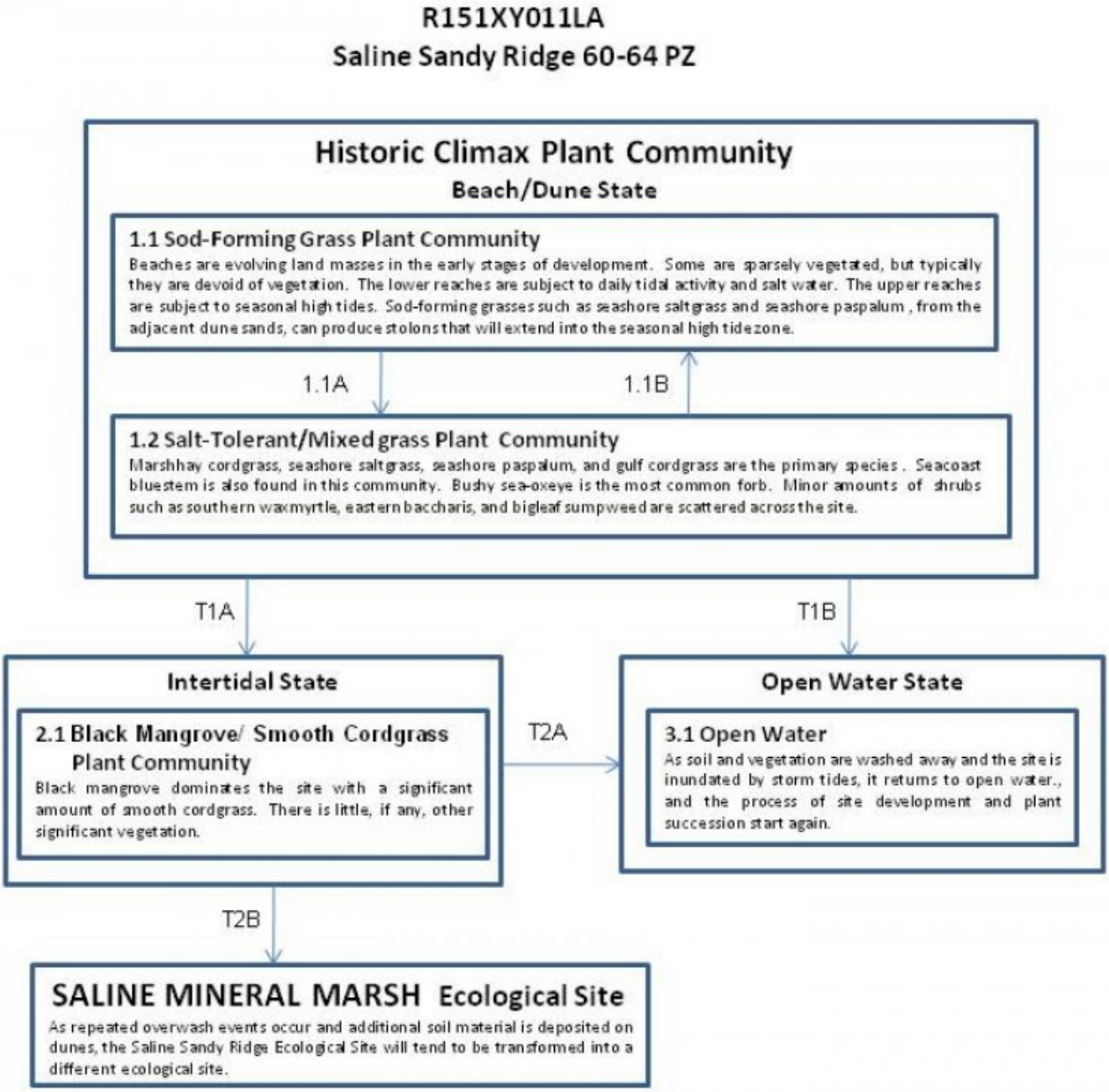

Figure 4. Saline Sandy Ridge

State 1

Beach/Dune State

Community 1.1
Sod-Forming Grass Plant Community

Beaches are evolving masses and are typically sparsely vegetated or devoid of vegetation. The lower reaches are subject to daily tidal activity. The upper reaches are subject to seasonal high tides. Sod-forming grasses such as seashore saltgrass and seashore paspalum which are rooted in adjacent dune sand, can produce stolongs that extend into the seasonal high tide zone.

Community 1.2
Salt-Tolerant/Mixed Grass Plant Community

The mixedgrass plant community consists of plants that can withstand droughty and saline conditions. Blowing sand causes the soil surface to shift frequently. This results in the plant community being in a continual state of flux. Marshhay cordgrass, seashore saltgrass, seashore paspalum, and gulf cordgrass are the major species in this community. Seacoast bluestem is a minor component of the plant community. It is a rhizomatous plant that spreads vegetatively and traps sand. It can play a major role in dune formation and stabilization, especially on barrier islands. Bushy sea-oxeye is a salt tolerant forb that is frequently found on the site. Southern waxmyrtle, eastern baccharis, and bigleaf sumpweed are shrubs that occur in minor amounts. This plant community may exist in dense stands, but may also occur as sparsely vegetated areas interspersed among bare sand areas.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	0	1500	2600
Shrub/Vine	0	50	200
Forb	0	75	200
Total	**–**	**1625**	**3000**

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

State 2
Interdial State

Community 2.1
Shrub/Smooth Cordgrass Plant Community

The intertidal plant community is an area subject to daily tidal exchange. This community occurs on the back side of the dunes, opposite from the beaches. Vegetation consists almost totally of smooth cordgrass and black mangrove. This plant community is subject to storm surges which can cause overwash and deposit excessive amounts of sediment on the area. When overwash occurs, the pneumatophores of black mangrove are covered and these shrubs die. At that point, the remaining vegetation consists of a sparse stand of smooth cordgrass interspersed in a barren mudbank of overwash material. Successive overwashes will eventually result in the transformation of the Saline Sandy Ridge Ecological Site to a Saline Mineral Marsh Ecological Site.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	0	500	1250
Shrub/Vine	0	200	500
Forb	0	25	50
Total	**–**	**725**	**1800**

Figure 8. 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 Gulf Water State

Community 3.1
Open Water

Additional community tables

Table 7. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Grass/Grasslike**			0–2600	
	saltmeadow cordgrass	SPPA	*Spartina patens*	0–2000	–
	gulf cordgrass	SPSP	*Spartina spartinae*	0–1000	–
	gulf bluestem	SCMA3	*Schizachyrium maritimum*	0–1000	–
	smooth cordgrass	SPAL	*Spartina alterniflora*	0–1000	–
	seashore paspalum	PAVA	*Paspalum vaginatum*	0–300	–
	saltgrass	DISP	*Distichlis spicata*	0–300	–
	seashore dropseed	SPVI3	*Sporobolus virginicus*	0–200	–
	bitter panicgrass	PAAM2	*Panicum amarum*	0–100	–
Forb					
2	**Forbs**			0–200	
	bushy seaside tansy	BOFR	*Borrichia frutescens*	0–200	–
	turkey tangle fogfruit	PHNO2	*Phyla nodiflora*	0–50	–
Shrub/Vine					
3	**Shrubs**			0–200	
	black mangrove	AVGE	*Avicennia germinans*	0–200	–
	Jesuit's bark	IVFR	*Iva frutescens*	0–100	–
	wax myrtle	MOCE2	*Morella cerifera*	0–50	–
	eastern baccharis	BAHA	*Baccharis halimifolia*	0–50	–

Animal community

This site is not grazed by livestock, and does not produce vegetation with any significant value as a food source for deer, furbearers, geese, or ducks. Large populations of invertebrates, including mollusks and crustaceans, are

found on undisturbed or minimally disturbed beaches and bars. Many species of shore birds use the shoreline extensively as a feeding ground.

Hydrological functions

The hydrologic function that impacts this site is tidal activity. Incoming tides and storm surges deposit sand particles and shell fragments to form beaches. Storm tides can act to demolish ridges and beaches alike. Onshore currents gradually move barrier islands and beaches in a southwesterly direction by eroding the eastern end of the island and depositing the sand particles at the western end.

Recreational uses

Due to their isolation and inaccessibility, the barrier islands are rarely disturbed by human activity. Accessible beaches and dunes on the mainland are favored areas for swimming, fishing, sunbathing, and associated activities. Litter is often a problem on the beaches. Off-road motorized vehicles can be particularly destructive on coastal dunes and beaches. Use of motorized vehicles on this site is discouraged, and frequently prohibited. This is a fragile site that is very susceptible to erosion, damage to vegetation, etc.

Other information

This site is NOT grazed by livestock and does not produce vegetation with any significant value as a food source for deer, furbearers, geese or ducks.

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 Sandy Chenier ecological site. In addition vegetation transect data from Lafourche Parish collected in 1984 and 1991 was used to determine species occurrence and production on typical Sandy Chenier ecological sites.

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Contributors

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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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Date	10/11/2010
Approved by	Johanna Pate
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:** Numerous as a result of tidal surge and overwash from Gulf of Mexico

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 50% bare ground

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

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Extensive shifting dune activity, occasional scoured areas caused by wind energy from the Gulf. Frequent deposition from overwash.

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7. **Amount of litter movement (describe size and distance expected to travel):** Significant amounts of litter and debris are deposited, moved from place to place, and removed frequently.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Unstable soil conditions. Soil surface is highly susceptible to sheet erosion and wind erosion from frequent and severe storms.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface texture is sand to loamy fine sand throughout the profile. Numerous shell fragments occur throughout.

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

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

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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: Dominant: Warm-season grasses >Sol-forming grasses>>Shrubs>/firbs

    Sub-dominant:

    Other:

    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):**

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

production): 0 to 3000 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:** N/A

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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 reporductive phase.
