

**BENEFICIAL USE OF DREDGED MATERIAL DISPOSAL HISTORY
ATCHAFALAYA RIVER AND BAYOUS CHENE, BOEUF AND BLACK, LA
HORSESHOE - CREWBOAT CUT**

The Rivers and Harbors Act of 25 June 1910 authorized the CEMVN to construct and maintain a navigation channel through the Atchafalaya River from Morgan City to the Gulf of Mexico with project dimensions 20 feet deep, 200 feet wide and 15.75 miles long from the 20 foot contour in the Atchafalaya Bay, approximately 4 miles beyond the mouth of the Atchafalaya River, to the 20 foot contour in the Gulf of Mexico. Traffic sufficient to warrant maintenance of the authorized navigation channel to full project dimensions did not immediately develop. The channel was progressively enlarged during maintenance events from 10 by 100-feet in 1939 to 20 by 200-feet in 1974.

The Rivers and Harbors Act of 1968 authorized construction and maintenance of the Atchafalaya River and Bayous Chene, Boeuf, and Black, Louisiana project which provided an increase in channel width to 400 feet for the navigation channel in the Lower Atchafalaya River-Horseshoe reach from the junction of Avoca Island Cutoff Bayou channel to the Atchafalaya Bay. Construction of the channel in the bay and Gulf was initiated in April, 1974 and was completed in December of the same year. Maintenance in Lower Atchafalaya River - Horseshoe channel was not required prior to FY 1990 because channel depth historically was in excess of authorized channel dimensions. Dredging records dating back to 1989 indicate that discontinuous segments of this channel reach, or the intersection of Bayou Chene and the Lower Atchafalaya River, have been maintained annually with disposal of dredged material taking place in the Lower Atchafalaya River (LAR) since FY 1990. Since maintenance of the Lower Atchafalaya River began, dredged material has been deposited unconfined in open water and unconfined in open water adjacent to the existing river banks for wetlands development. No dredged material was placed on the existing shoreline.

Fiscal Year 2002

No maintenance dredging in the Lower Atchafalaya River - Horseshoe reach was performed during FY 2000 - 2001.

Prior to the FY 2002 maintenance event, the CEMVN, in coordination with state and Federal natural resources agencies, developed a plan for use of wetland development site **I**, a 350-acre open water placement site atop a natural shoal between the navigation channel and Crewboat Cut. Dredged material would be placed unconfined upstream of a naturally formed mid-channel island as a series of mounds within the site in a manner that would allow water circulation between the mounds. The maximum initial elevation of the dredged material placed within the site would be no higher than + 5.0 feet MLG.

During the 2002 maintenance event (2 March 2002 – 2 April 2002), the cutterhead dredge TOM JAMES, working under contract 02-C-0029, removed a total of approximately 1,239,050 cubic yards of dredged material from the LAR Horseshoe channel. Dredged material was placed unconfined at two mounds located in wetland development site **I**.

Approximately 1,052,498 cubic yards of material were placed at **Mound #1**, and about 186,552 cubic yards of material were placed at **Mound #2**. Approximately 25 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Horseshoe (19 May 2002)

Fiscal Year 2003

During the 2003 maintenance event (25 July 2003 – 4 September 2003), the cutterhead dredge GEORGE D WILLIAMS, working under contract 03-C-0048, removed a total of approximately 1,489,342 cubic yards of material from the LAR Horseshoe channel. Dredged material was placed unconfined at two separate mound sites within wetland development site I.

A total of 1,250,787 cubic yards were placed at **Mound #1** and 238,555 cubic yards were placed at **Mound #2**. Approximately 33 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Horseshoe (30 December 2003)

Fiscal Year 2005

During the 2005 maintenance event (2 August 2005 – 21 September 2005), the cutterhead dredge VENTURE, working under contract 05-C-0042, removed a total of approximately 1,022,655 cubic yards of material removed from the LAR Horseshoe channel. Dredged material was placed unconfined at 3 separate mound locations within wetland development site **I** to a maximum initial elevation of about +5 feet MLG.

Approximately 478,393 cubic yards were placed at the northernmost **Mound 1A**. Approximately 479,719 cubic yards were placed at the middle **Mound 1**. Approximately 64,543 cubic yards were placed at the southernmost **Mound 2**. A total of approximately 5 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Horseshoe (2005)

Fiscal Year 2006

During the 2006 maintenance event (28 September 2006 – 22 October 2006), the cutterhead dredge VENTURE, working under contract 06-C-0181, removed a total of approximately 525,693 cubic yards of material from the LAR Horseshoe channel. Dredged material was placed unconfined at 2 separate mound locations within wetland development site **I** to a maximum initial elevation of about +5 feet MLG.

Approximately 246,433 cubic yards were placed at the northern **Mound 1**. Approximately 279,260 cubic yards were placed at the southern **Mound 2**. Approximately 5 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Horseshoe (5 October 2006)

Fiscal Year 2007

During the 2007 maintenance event (15 September 2007 – 9 October 2007), the cutterhead dredges GD WILLIAMS and TOM JAMES, working under contract 07-C-0081, removed a total of approximately 634,216 cubic yards of material from the LAR Horseshoe channel. Dredged material was placed unconfined at 2 separate mound locations within wetland development site I to a maximum initial elevation of about +5 feet MLG.

Approximately 40 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Horseshoe (28 November 2007)

Fiscal Year 2008

During the 2008 maintenance event (19 August 2008 – 22 September 2008), the cutterhead dredge TOM JAMES, working under contract 08-C-0085, removed a total of approximately 1,024,290 cubic yards of material from the LAR Horseshoe channel. Dredged material was placed unconfined at 2 separate mound locations within wetland development site **I** to a maximum initial elevation of about +5 feet MLG.

Approximately 316,081 cubic yards were placed at the northern **Mound 1**. Approximately 708,209 cubic yards were placed at the southern **Mound 2**. Approximately 25 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Horseshoe (7 January 2009)

Fiscal Year 2011

During the 2011 maintenance event (8 October 2010 – 12 November 2010), the cutterhead dredge CAPTAIN FRANK, working under contract 10-C-0117, removed a total of approximately 1,628,483 cubic yards of material from the LAR Horseshoe channel. All dredged material was placed unconfined at 2 separate mound locations within wetland development site **I** to a maximum initial elevation of +5.0 feet MLG.

Approximately 941,813 cubic yards were placed at the northern **Mound 1**. Approximately 686,670 cubic yards were placed at the southern **Mound 2**. Approximately 30 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Horseshoe (17 November 2010)

Fiscal Year 2012

During the 2012 maintenance event (2 October 2011 – 23 October 2011), the cutterhead dredge DREDGE 32, working under contract 11-C-0054, removed a total of approximately 203,981 cubic yards of material from the LAR Horseshoe channel. All dredged material was placed unconfined at a single mound (**Mound 3**) within wetland development site **I** to a maximum initial elevation of +5.0 feet MLG.

Approximately 10 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Horseshoe (17 November 2011)

Fiscal Year 2013

During the 2013 maintenance event (7 February 2013 – 3 March 2013), the cutterhead dredge BORINQUEN, working under contract 12-D-0007, removed a total of approximately 321,055 cubic yards of material from the LAR Horseshoe channel. All dredged material was placed unconfined at a single mound (**Mound 3**) within wetland development site **I** to a maximum initial elevation of +5.0 feet MLG. Approximately 2 acres of marsh habitat were created by this placement effort.

During this period, the Crewboat Cut bank stabilization rock foreshore dike was under construction in preparation for shifting the federal navigation channel east from the current Horseshoe channel alignment to follow the Crewboat Cut channel.



Lower Atchafalaya River – Horseshoe (29 November 2013)

Fiscal Year 2014

The initial construction of the Crewboat Cut navigation channel took place during 2014 (16 July 2014 – 4 August 2014). The Crewboat Cut channel replaced the previously maintained navigation channel in the LAR Horseshoe channel segment. The cutterhead dredge CALIFORNIA, working under contract 14-C-0039, removed a total of approximately 863,911 cubic yards of material from the Crewboat Cut channel. All dredged material was placed unconfined at 2 separate mound sites within wetland development site **I** to a maximum initial elevation of +5.0 feet MLG.

Approximately 2 acres of marsh habitat were created by this initial channel construction placement effort.



Lower Atchafalaya River – Crewboat Cut (8 November 2014)

Fiscal Year 2019

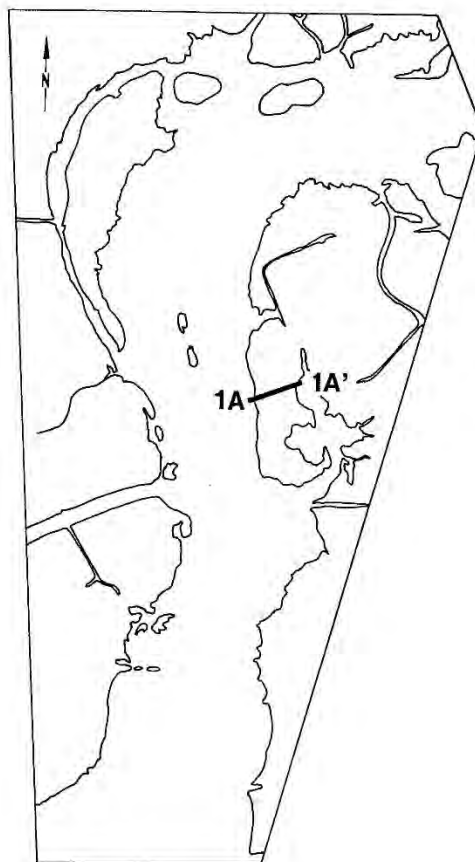
During the 2019 maintenance event (11 April 2019 – 7 May 2019), the cutterhead dredge ROBERT M WHITE, working under contract 18-C-0051, removed a total of approximately 913,677 cubic yards of material from the LAR Crewboat Cut channel. All dredged material was placed unconfined at a single mound within wetland development site **I** to a maximum initial elevation of +5.0 feet MLG. Approximately 19 acres of marsh habitat were created by this placement effort.



Lower Atchafalaya River – Crewboat Cut (December 2019)

2002 Elevation and Vegetation Survey Effort

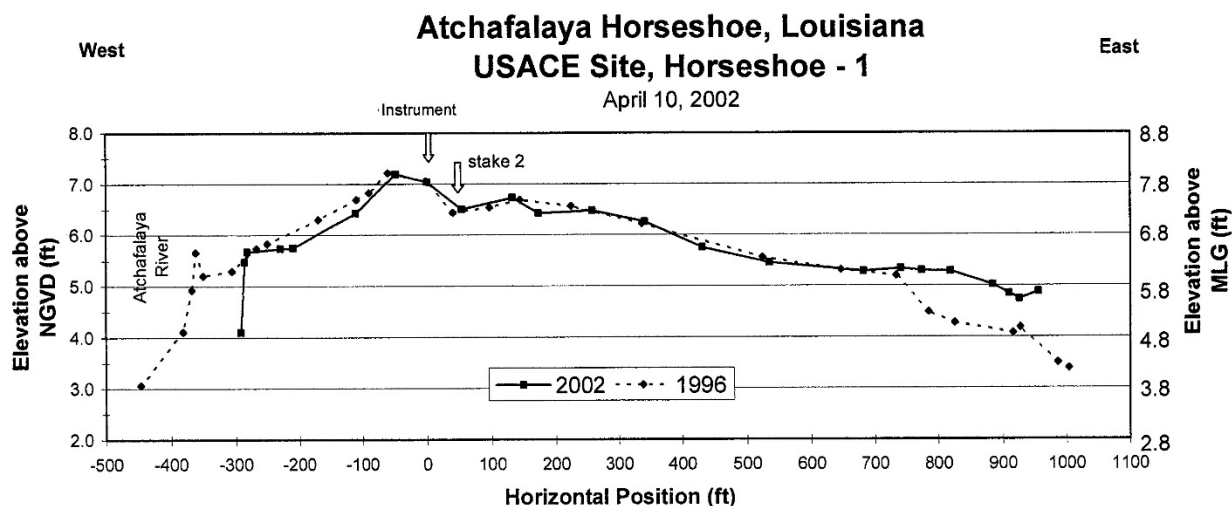
An elevation and vegetation survey was conducted on LAR Horseshoe placement site **B** during April 2002. A single transect profile, the same as was established for the 1996 survey effort, was utilized. This transect had a lateral length of 1,248 feet. The transect profile was characterized by an average elevation of +6.5 feet MLG, and a maximum elevation of +8.0 feet MLG. Even though the elevation sounds rather high, the area is influenced more by the river level than sea level, and the river level at this time period was approximately +6.1 feet MLG. To put this into perspective, the maximum elevation was only 2 feet above the river water level and the average elevation was less than a half a foot above the river water level.



Location of the transect at the Lower Atchafalaya River Horseshoe BUMP study site.

A comparison of the elevation data collected in 1996 and 2002, disregarding the channel side erosion and the relatively recent placement of dredged material at this site's eastern end, reveals the relative stability of the area. The profile in 1996 was 1,450 feet in length with an average elevation of +6.3 feet MLG and a maximum elevation of +8.0 feet MLG. This is a 13.9% decrease in overall length between 1996 and 2002 and an insignificant 3.6% decrease in average elevation. The greatest change in profile elevation was at either end, where the western, channel

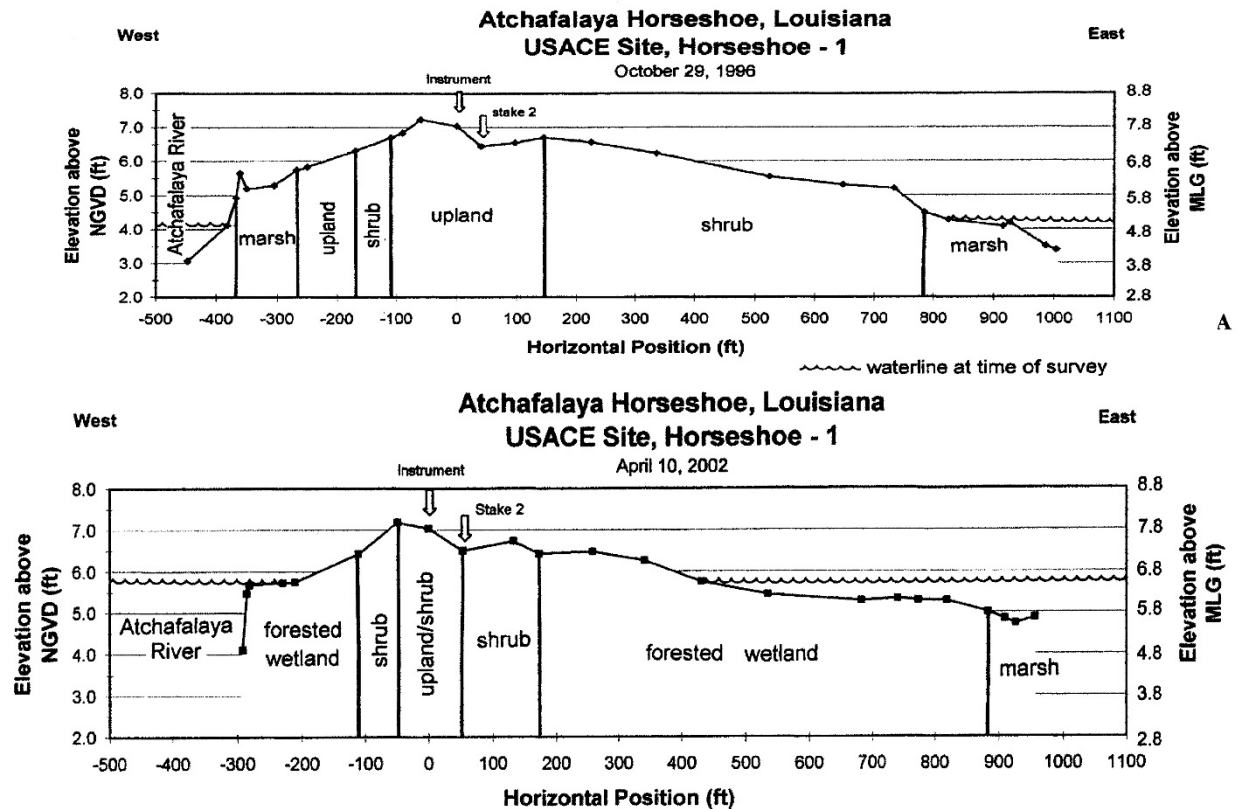
shore was eroded and scoured, and the eastern end was evened out and eased into the new deposits. The decrease in transect length between 1996 and 2002 was due to erosion and scour on the channel side.



A comparison of 1996 and 2002 elevation data at in the Lower Atchafalaya River - Horseshoe BUMP study area.

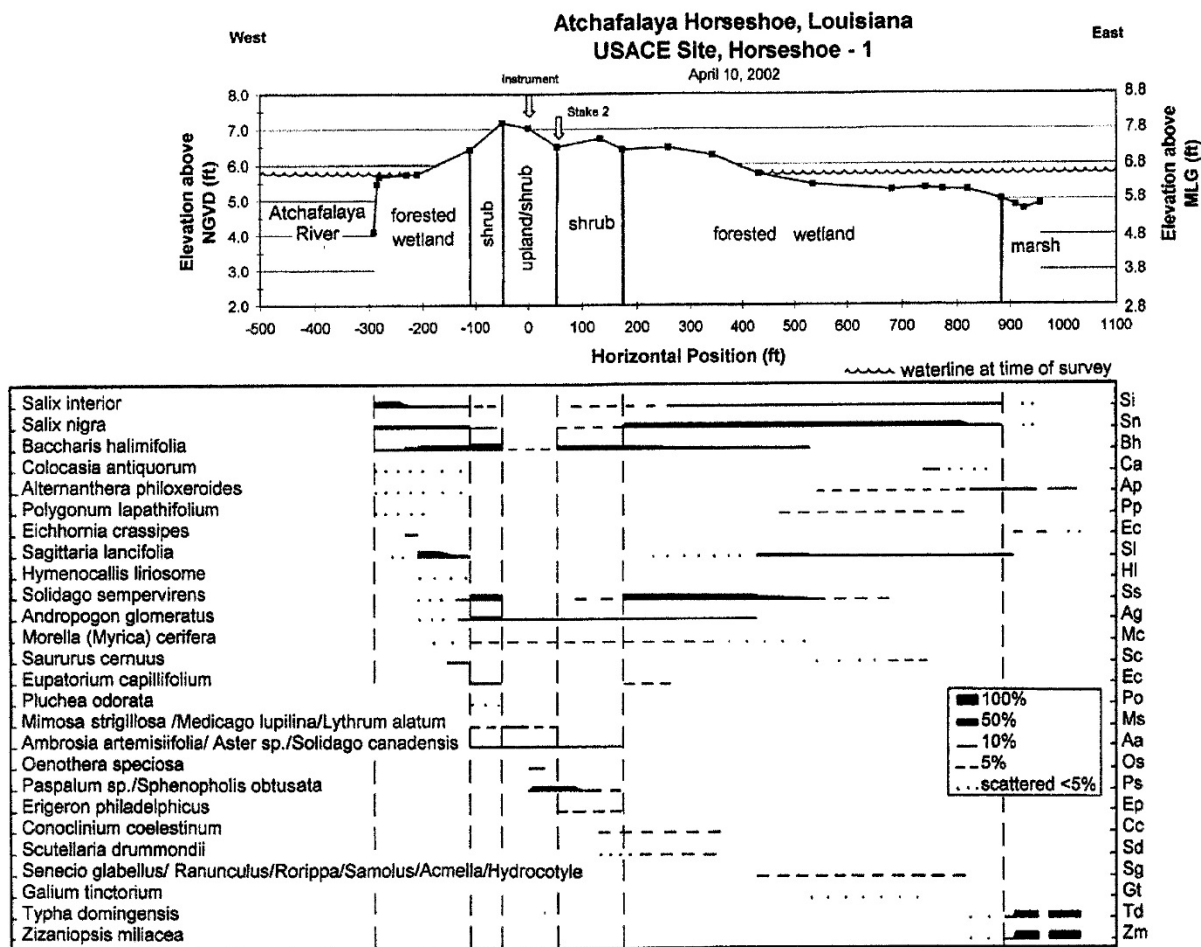
The transect profile was well vegetated, except for the dry open grass area of the channel-side stake. The landscape was dominated by willow swamp, shrub thicket, fresh marsh, and wetland border species. The fresh marsh was mostly cattail, wild rice, elephant ears, scirpus, or grasses. Trees observed in the area were willow (*Salix nigra* and *Salix interior*) with an occasional cypress (*Taxodium distichum*) seedling or small cottonwood (*Populus deltoides*). The shrubs were predominately groundsel bush (*Baccharis halimifolia*) and wax myrtle (*Myrica cerifera*). The higher elevations were occupied by grassland/meadow species.

A comparison of the vegetation data collected in 1996 and 2002 illustrates the changes that have taken place in the general distribution of habitats. Changes were observed in vegetative cover as annuals and opportunistic species changed between profile periods, and plant competition and succession processes progressed. Vegetative succession for a 6-year period was pronounced. Some bare areas had been colonized, and habitats have become more established or shifted as the elevation varied over time. The increase in the height and stature of the willow trees was the most obvious change. In 1996, this transect traversed on the channel-side from fresh marsh, willow "shrub" thicket, upland vine-terrace, to bare areas, willow "shrub" thicket and fresh marsh on the land-side. In 2002, this transect traversed on the channel-side from willow swamp, shrub thickets, narrow grassland/meadow with some shrubs to extensive willow swamp and fresh marsh on the land-side.



Elevation profile at the Lower Atchafalaya River - Horseshoe BUMP study area showing habitat distribution changes. A) 1996 data. B) 2002 data.

The study site in 2002 exhibited four basic zones of plant communities indicative of the predominant moisture regime. As one moved from the drier elevated central zone to the shoreline, one traversed from a grassland/meadow through a shrub zone then through an extensive willow swamp thicket to fresh marsh. There was a significant overlap of plant communities across these zones. Erosion or wave energy along the channel shoreline removed or precluded marsh development along the site's western end.



Elevation profile for transect 1 at the Lower Atchafalaya River - Horseshoe BUMP study site with vegetation data illustrated.

Marsh species within the study site occurred most commonly at an elevation below +5.3 feet MLG. Fresh marsh was represented by cattail (*Typha* spp) and wild rice (*Zizania aquatica*), alligator weed (*Alternanthera philoxeroides*) and elephant ears (*Colocasia antiquorum*) most often, with occasional stands of bulltongue (*Sagittaria* spp.). Marsh-margin species *Cyperus* sp., *Ranunculus sceleratus*, *Polygonum* spp., *Rorippa palustris*, and *Senecio glabellus*, were also locally abundant and scattered throughout low areas. The extended low relief of the study sites allowed a complex mixing of various species types. Very little fresh marsh other than water hyacinth (*Eichhornia crassipes*) was found along the erosional, channel shoreline along the site's west end. An extensive fresh marsh dominated by wild rice and cattails was encountered past the willow swamp at the inland (eastern) end of the site, and extended beyond the end of the transect.

Forested wetland, characterized by willow trees (*Salix nigra* and *Salix interior*), seemed to dominate the landscape throughout the study area, making thickets with other shrubs, scattered in many areas of the marsh, along low energy beaches, or within grassland areas. Fresh marsh formed the understory at the lower elevations, and shrubs and grasses occurred at the higher elevations. Closely spaced willow trees in extensive shallow, inundated areas

shaded out most fresh marsh species in some areas. The willow forested wetland zone occurred most commonly at an elevation between +5.8 and +8.3 feet MLG. An occasional cypress seedling (*Taxodium distichum*) was also discovered along the transect profile, but not in significant numbers or stature.

Shrub communities typically are indicative of older, more stable, elevated areas. In the Atchafalaya area, this community overlaps greatly with the willow forested wetland zone, and the species present must be able to withstand periods of inundation. Young willows below 15 feet tall are also considered shrubs. Groundsel bush (*Baccharis halimifolia*) occurred throughout the transect profile, but it attained its most dense presence usually between +2.5 and +4.0 feet MLG. Wax myrtle (*Myrica cerifera*) seemed to prefer less soil moisture and occurred along the more elevated parts of the shrub zone, above +3.5 feet MLG, and was scattered across the upper elevations. The understory toward lower elevations was characterized by bulltongue (*Sagittaria* sp), butterweed (*Senecio glabellus*), willow-weed (*Polygonum* spp.), and elephants ear (*Colocasia antiquorum*), and the upper elevations were characterized by goldenrod (*Solidago* spp.), broomsedge (*Andropogon glomeratus*), thoroughwort (*Eupatorium capillifolium*), and grasses.

Upland areas within the study site were represented by occasional grasslands, herbaceous meadows, and shrub/scrub. *Andropogon glomeratus*, *Sphenopholis obtusa*, and *Paspalum* spp. tended to be the most common grass species, with *Aster* spp, *Eupatorium capillifolium*, *Solidago* spp., *Lythrum alatum*, *Mimosa strigullosa* and *Ambrosia artemisiifolia* as common herbaceous plants. Even though the dominant vegetation was considered marsh-margin, this area was designated as upland because it supported some upland species and few wetland obligates. An occasional cottonwood tree (*Populus deltoides*) was discovered near the transect profile on higher elevations, but not enough to be considered forested land.

Development of the Mid-Channel Island

Since placement of dredged material at the mid-channel wetland creation disposal site “T” beginning in 2002, dredged material placed as a series of unconnected mounds upstream of a naturally occurring island located in the middle of the LAR at the Horseshoe Bend channel reach has contributed to the growth of this island as a result of natural LAR hydrologic influences. Prior to placement of dredged material in disposal site “T” in 2002, this island was approximately 8 acres in size. As of November 2016, this island was measured at approximately 86 acres in size.

An evaluation of ecosystem characteristics conducted in 2013 identified over 80 species of plants (85% native) and over 20 faunal species existing within four distinct habitat types (forested wetland, scrub-shrub wetland, emergent wetland, and aquatic bed wetland). Soils exhibited common characteristics associated with island formation as well as depleted matrices and redoximorphic features indicating biogeochemical processing. An August 2011 site inspection of this island and the 2013 ecosystem evaluation report are included at the end of this document.



Lower Atchafalaya River – Crewboat Cut (16 November 2016)
Horseshoe Bend Island