

2017 Bill Terrell Conservation Grant Report: Coastal Shorebird Management

Introduction:

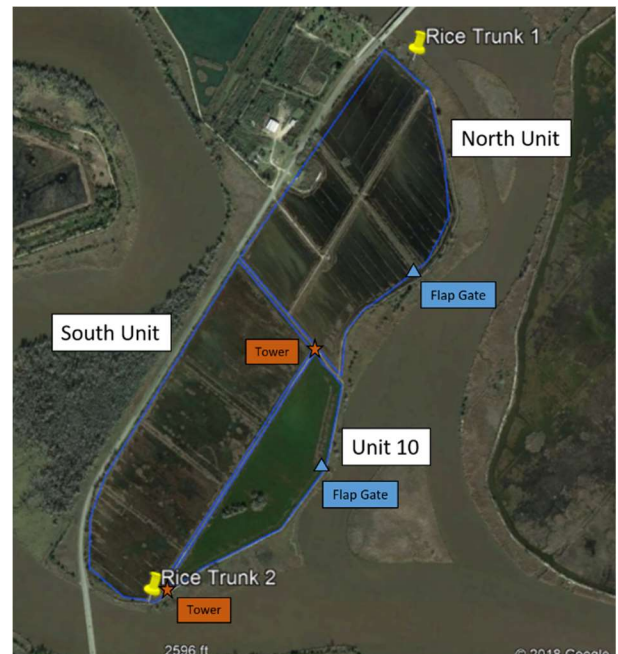
Active habitat management is a necessary component of supporting shorebird populations using the Georgia coast. The 2017 Bill Terrell Conservation Grant supported two projects with direct benefit to shorebirds at different times of the year. The first activity yielded the installation of two new water control structures in the Butler Impoundments at the Altamaha Wildlife Management Area in Brunswick Georgia. This improvement will make it possible to better regulate the water depth in separate units of the impoundment system, which will influence the vegetation structure and feeding opportunities for shorebirds. The second activity addressed managing predators at key shorebird and seabird nesting sites that support up to 17 pairs of American Oystercatcher, and an ever-changing assortment of seabirds. Predator management from this project, in tandem with significant efforts by other partners along the coast lead to three years with the highest documented nest success for American Oystercatcher statewide and helped reestablish an abandoned Brown Pelican colony on Little Egg Island Bar.

Coastal Shorebird Management

Activity 1: Butler Island water control structures for shorebird habitat management

Funds from this grant were used to install two rice trunk water control structures, shown in Figure 1. Rice Trunk 1 was installed prior to the monitoring period on March 14, 2018, and was used to control water levels in the North Unit. The two flap gates along the eastern side of the system are also used by managers to control water levels in the North Unit and in Unit 10, respectively. Rice Trunk 2 was under construction for much of the survey period, resulting in altered hydrology that was not conducive to the creation of shorebird habitat. However, by June 21, 2018, Rice Trunk 2 installation was finalized and it was functional by August of that year (Figure 2).

The monitoring protocol for the Butler Island Impoundment was modified from the Integrated Waterbird Management and Monitoring Approach for Nonbreeding Waterbirds (Loges et al. 2017), and structured to fit the International Shorebird Survey protocols (https://www.manomet.org/wp-content/uploads/2018/03/ISS-Protocols_April2019.pdf). Therefore in addition to recording shorebird species that were present in the impoundment, we recorded physiographic features including vegetation, interspersions, estimated depth, salinity and disturbance. Surveys were conducted within two hours on either side of high tide to account for variability of use due to availability of habitat in tidal zones. Using this approach, we were able to assess shorebird use, vegetation, approximate water depth and salinity during our intensive monitoring period (August 15-October 30 2018) and more sporadically (October 31-October 18 2019) to understand how the water control structures influenced habitat at the Butler Impoundments during periodic surveys (n=10).



During surveys, three independent units were identified. These units had variable depths and vegetation characteristics, primarily due to historic separations between subunits, as seen in the Figure 1. However, these remnant dikes are no longer sufficient to maintain separation, and management to influence water levels impacts all subunits with each of three, larger independent units. Therefore, for the purposes of monitoring, we chose to treat the Butler Island system as three units: the North Unit, Unit 10, and the South Unit.



Figure 2 Rice Trunk 2, installed and functioning by August 1, 2019.

During our surveys, we observed that water levels and vegetation density influenced the abundance and species composition of shorebirds. During the entire survey period, Unit 10 had the highest numbers of shorebirds and the greatest diversity of species. From August 2018 through the middle of October, water levels were variable but in the majority of this unit, depths remained about 4-6 inches, with areas of open and mixed vegetation. This corresponds to our observations of the greatest use by shorebirds (Figure 3). At the end of October, the eastern dike was overtopped as a result of Hurricane Michael. Prior to the storm, diversity was high, with the most common species being Least Sandpipers (*Calidris minutilla*), Lesser Yellowlegs (*Tringa flavipes*), and Pectoral Sandpipers (*Calidris melanotos*). Following the breach in the eastern dike, Unit 10 was flooded during full and new moon tides, and was often too deep to provide adequate resources for shorebirds (Table 1).

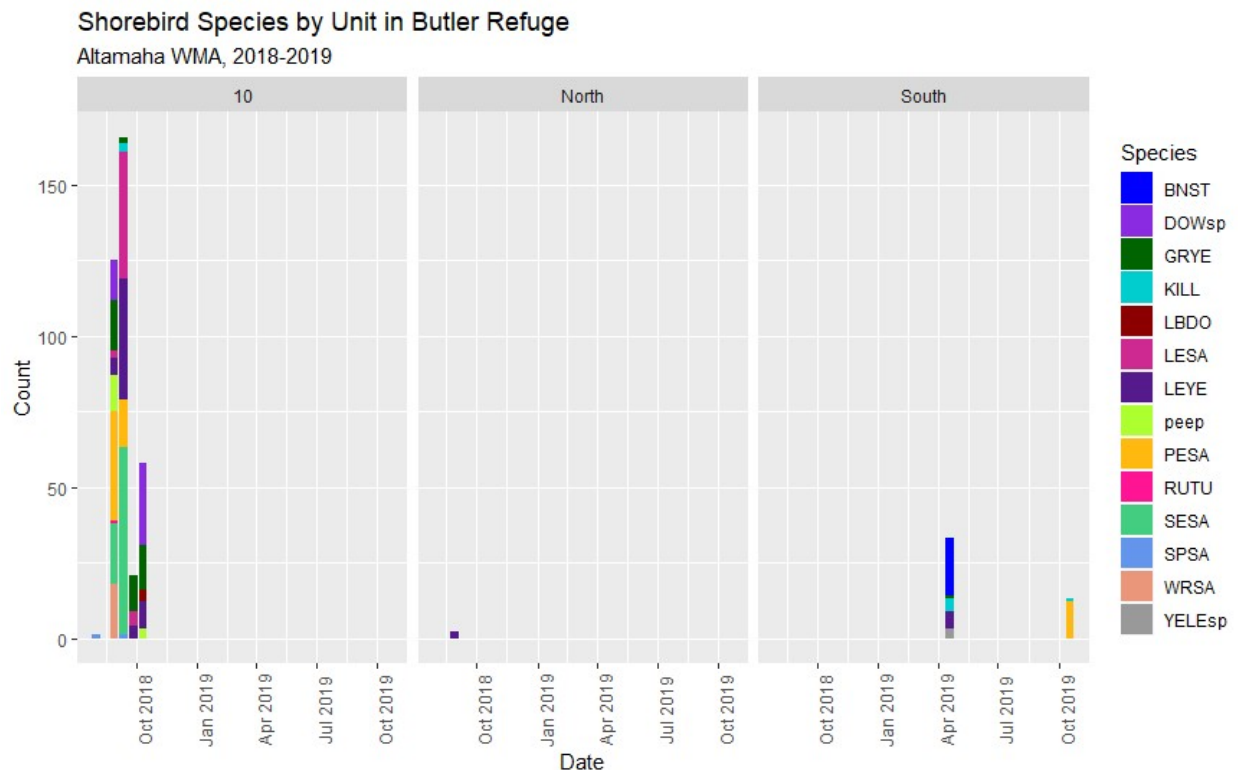


Figure 3: Shorebird counts, by species within three units at Butler Island, Altamaha WMA, Georgia from October 2018-2019.

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Figure 4 Dense cutgrass dominates significant parts of Unit 10, Butler Impoundments at the Altamaha WMA, Georgia.

Throughout the survey period, the North Unit held deep water and much of the lower areas were heavily vegetated with dense rye cutgrass (*Leersia oryzoides*) and sesbania (*Sesbania herbacea*) stands (Figure 4). There was only one survey when shorebirds were recorded using this unit (2 Lesser Yellowlegs), although there were other wading birds and waterfowl often observed. While some vegetation is important to provide structure, refuge and habitat for invertebrates which provide food for shorebirds and other waterfowl (Helmert 1992), high density vegetation dominated this unit after water levels were lowered to install the rice trunk. High water levels are often an important control of vegetation, but the combination of high water and dense vegetation left very little available habitat for shorebirds during this survey period. However, management is ongoing, and with the additional control provided by the newly installed rice trunk, this unit will be able to provide shorebird habitat in the future.

The South Unit, controlled by Rice Trunk 2, was primarily vegetated with significant stands of dense sesbania during the early portion of the survey period. From mid-August through October 2018, water was drawn off the unit, and the resulting mud flats dried out entirely, providing very limited habitat for shorebirds. There were no shorebirds using this unit during the 2018 surveys. By spring 2019, water levels were increased. During the spring survey, we recorded Black-necked Stilts (*Himantopus mexicanus*), Lesser Yellowlegs, and Killdeer (*Charadrius vociferous*) in the unit. However, in an attempt to manage sesbania and other woody vegetation, water levels were maintained too high to provide adequate resources for shorebirds during follow up surveys. In October 2019, shorebird habitat was available for a short window, when a flock of a dozen Pectoral Sandpipers was observed.

Moving Forward

Both Hurricane Irma (September 2017) and Hurricane Michael (October 2018), caused significant damage to the Butler Island Impoundment system, including breaching the eastern wall (Figure 5). Despite the rice trunk installations, water levels were difficult to manipulate because extreme tides continued to overtop these structures. Perimeter dike work to repair this damage was ongoing throughout the survey period and completed in late spring of 2020 (Robert Horan, pers. comm). Ongoing challenges to control vegetation continue, which were exacerbated with altering the hydrology of the impoundments to allow for the installation and repair work. To date, managers



Figure 5 Water flap gate on Eastern side of North Unit, showing damage from Hurricane Michael, resulting in high water levels.

are still working to clear thick stands of cutgrass from the North Unit, but the dense sesbania that was present in the South Unit seems to have been controlled as Rice Trunk 2 has become more functional.

The GA-DNR managers and staff at Altamaha WMA are committed to managing the Butler Island Impoundment to provide habitat for shorebirds during spring and fall migration. In February 2019, managers from this property attend an impoundment information exchange, hosted by Manomet,



Figure 6 During an impoundment managers' workshop, participants discuss strategies to provide shorebird habitat.

which included site visits to several properties in South Carolina, including Santee Coastal Reserve and the Yawkey Center. The purpose of this meeting was to increase communication among managers and staff at impoundments, and serves as a follow-up to a Habitats for Shorebirds Workshop led by Manomet in 2015. Over the course of two days, participants shared ideas and strategies for how to best manage impoundments while dealing with common issues like storm damage, sea level rise, and challenging vegetation.

Following this survey period, ISS surveys have continued at Butler Island Impoundments, and ongoing monitoring

continues to highlight the challenges of managing this site for shorebirds. When conditions are ideal, it can host a wide variety of common and rare shorebirds species, and provide an important refuge during high tide events that limit foraging opportunities elsewhere. Continued improvements to the east dike will ensure that managers are able to manipulate water levels without breaching, but as sea levels continue to rise, this challenge is ongoing. Throughout this monitoring period, documenting shorebird use as well as hydrologic and vegetation changes has revealed that managing impoundments for certain desired conditions is a delicate combination of an art and a science. However, with the installation of the two rice trunks at Butler Island, managers have all the tools they need to continue to fine-tune the landscape to provide habitat shorebirds during multiple seasons.

Activity 2: Predator Management at key beach nesting bird sites.

Trapping Summary:

Using funds from this grant we contracted with Wildlife Services (WS) to complete two years of trapping on Little Egg Island Bar, one of our most important shorebird and seabird nesting sites on the coast. This is a notoriously challenging location to trap, given the difficulty in accessing the location, and its large size, providing predators many acres of cover. Over the last 10 years it has also been migrating westward due to storms and erosion, bringing it closer to upland habitat source for raccoon populations on Egg Island proper (USFWS property – associated with Wolf Island NWR). We were not able to trap on the Ogeechee as our trapper tragically became very sick and died in 2018.

2018

In 2018, GA DNR contacted WS to conduct raccoon control on Egg Island and Little Egg Bar with hopes of increasing Oystercatcher nesting success. A total of 27 raccoons were removed from the area of concern. Below is a brief description of each removal event.

Results

Removal Event 1

The initial goal of the raccoon management program was to decrease the raccoon population on Egg Island prior to nesting season. Forty-six capture devices (z-traps, dog proof) were deployed on February 20th and monitored for two days. Due to low capture success, WS personnel decided to transition over to Little Egg Bar on February 22nd for surveillance and opportunistic removal purposes. A total of 13 raccoons were removed (7 trap, 6 firearm). From the total, four were removed from Little Egg Bar.

Removal Event 2:

Due to raccoon depredation activity, the second removal event was scheduled during the week of April 9th. During this time period, thirty-seven capture devices (z-traps, dog proof) were deployed on Little Egg Bar and monitored for two days. Only three raccoons were removed during this capture event. Capture devices were removed due to low activity.

Removal Event 3:

As a follow-up to the second removal event, two WS personnel conducted nighttime surveillance activities on Little Egg Bar during May 24th and May 25th. During this period, four raccoons were removed opportunistically while conducting night patrols.

Removal Event 4:

Considering the remote access to the island and low removal rates, WS decided to incorporate aerial operations during June 6th and June 7th. The helicopter was in the area during this period conducting aerial operations to reduce feral swine damage. An additional 7 raccoons were removed while conducting these operations.

2020

We contracted again with WS in 2020 using funds from this grant to continue raccoon depredation work on Little Egg Island Bar. Efforts were hampered by the onset of the global pandemic, but some trapping was still conducted.

Removal Event 1:

The initial goal of the raccoon management program was to decrease the raccoon population on Little Egg Bar prior to nesting season. Seventeen capture devices (z-traps, dog proof) were deployed on February 10th and monitored for two days. The capture devices were baited with a mixture of shrimp, cat food and shellfish oil. A total of 8 raccoons were removed through trapping efforts.

Removal Event 2:

Due to raccoon depredation activity, the second removal event was scheduled during the week of 11 March. During this time period, twenty-nine capture devices (z-traps, dog proof) were deployed on Little Egg Bar and monitored for two days. Only one raccoon was removed during this capture event. Capture devices were removed due to low activity.

Removal Event 3:

As a follow-up to the second removal event, two WS personnel camped on the island from 28 April – 1 May. During this removal event, forty-five capture devices were deployed and monitored. Additionally, nighttime surveillance activities were conducted to supplement trap removal efforts. During this time period, two raccoons were removed opportunistically while conducting night patrols and no raccoons were removed with capture devices.

Aerial Operations. USDA offered to conduct an aerial removal effort in late June as part of their hog control effort on the coast. We declined their offer despite its efficacy due to a large and active Brown Pelican Colony on Little Egg Bar, and approximately 2,500 roosting Brown Pelicans on the bar. We determined that this benefit would not be worth the risk to the pelican colony or the aircraft given the number of birds using the site.

Trapping Summary:

We were able to contract with WS for two seasons of trapping on Little Egg Island Bar, in 2018 and 2020. A combination of trapping methods were used, including traps, shooting, and aerial targeting. In all 37 raccoons were removed from Little Egg Island Bar. Little Egg Island Bar was coming off two hurricanes (Matthew 2016, Irma 2017) both of which significantly impacted the nesting quality on Little Egg Island Bar. These storms eroded nesting sites such that overall elevations were lower than before, and the westward migration of the island continued. Despite these challenges, during the period of this grant, with 2 seasons trapping effort on the bar, we were able to surpass our productivity goals for the site (replacement productivity 0.33 chicks/pair) (Table 2). This nesting success on one of our more important nesting sites helps boost our statewide productivity, which has been higher in 2018, 2019 and 2020 than any previously documented year (Table 3). Another indication of the multi-year benefits to conducting predator control on this site is the reestablishment of a large Brown Pelican colony on Little Egg Bar. Historically Little Egg Island Bar hosted one of the largest brown pelican colonies in Georgia. In 2012 Tropical Storm Beryl, a record setting early storm flooded the entire colony. Pelicans in small numbers still attempted to nest in most subsequent years but were picked off gradually by raccoon until they abandoned the site. In 2020 we documented 421 nesting Brown Pelican pairs on the bar.

| Year | AMOY Pairs | Fledged Young | Site Productivity |
|----------------|------------|---------------|-------------------|
| 2018 | 17 | 3 | 0.18 |
| 2019 | 16 | 10 | 0.63 |
| 2020 | 15 | 5 | 0.33 |
| AVERAGE | 16 | 6 | 0.375 |

Table 2: AMOY productivity on Little Egg Island Bar during project period

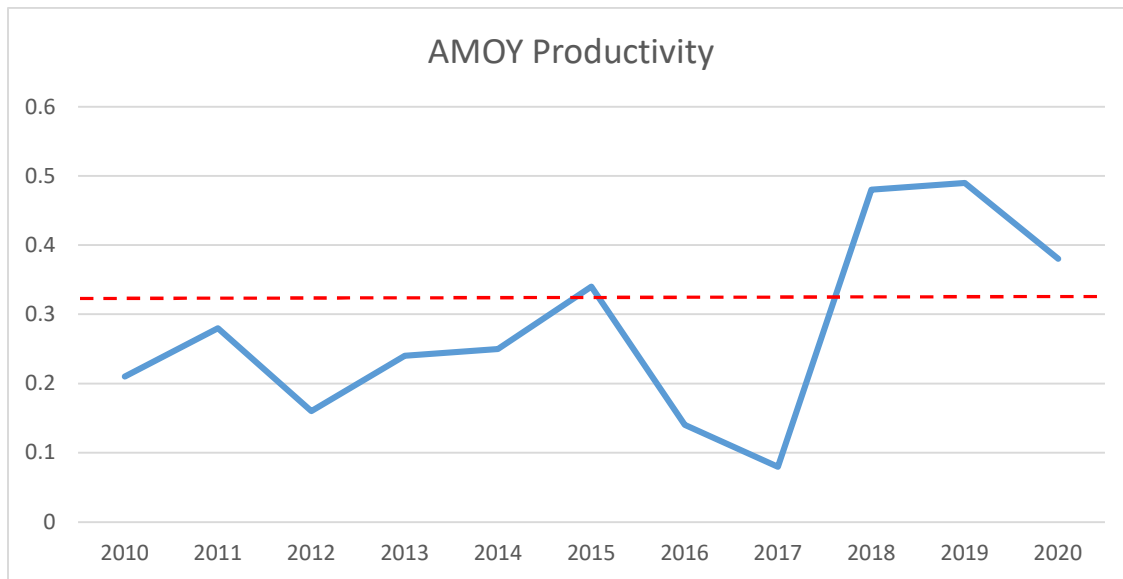


Table 3: Annual productivity for American Oystercatcher statewide. Red Line shows replacement productivity levels for the species.

| Year | Brown Pelican nests on LEIB |
|-------------|-----------------------------|
| 2011 | 1,744 |
| 2012 | 538 |
| 2013 | 13 |
| 2014 | 81 |
| 2015 | 0 |
| 2016 | 0 |
| 2017 | 0 |
| 2018 | 0 |
| 2019 | 69 |
| 2020 | 421 |

Table 4: Brown Pelican nesting on LEIB 2011-2020. Major decline associated with tropical storm flooding. Gradual recent increase aided by predator management.

Citations

Loges BW and Others. 2017. National Protocol Framework for the Inventory and Monitoring of Waterbirds and their Habitats: An Integrated Waterbird Management and Monitoring (IWMM) Approach [Version 1-9, In Review]

Helmets, Doug. 1992. "Shorebird Management Manual." Western Hemisphere Shorebird Reserve Network. Manomet, MA. 58pp.

Additional Tables and Figures

| Summary of Habitat Conditions per survey, by unit at Butler Impoundments, Oct 2018-2019 | | | | |
|--|--|-------------------------|----------------------------|------------------------|
| Date | Description | Comments | Individuals Counted | Species Counted |
| 10 | | | | |
| 8/2/2018 | deep water, open water in middle and along edges, mix vegetation | too deep for shorebirds | 1 | 1 |
| 8/15/2018 | 8-10 inches deep, open water in middle and along edges, mix vegetation | good shorebird habitat | 0 | 0 |
| 8/29/2018 | 4-6 inches in middle, open water in middle and along edges, mix vegetation | good shorebird habitat | 128 | 10 |
| 9/12/2018 | 4-6 inches in middle, open water in middle and along edges, mix vegetation | good shorebird habitat | 166 | 7 |
| 9/27/2018 | 4-6 inches in middle, open water in middle and along edges, mix vegetation | good shorebird habitat | 21 | 3 |
| 10/12/2018 | 4-6 inches in middle, open water in middle and along edges, mix vegetation | good shorebird habitat | 58 | 5 |

| | | | | |
|--------------|---|----------------------------|---|---|
| 10/26/2018 | deep water, east bank overtopped and water flowing freely, open water in middle and along edges, mix vegetation | too deep for shorebirds | 0 | 0 |
| 4/19/2019 | deep water, dabbling ducks and waders present, open water in middle and along edges, mix vegetation | too deep for shorebirds | 0 | 0 |
| 8/1/2019 | deep water, waders present, mats of algae on open water, mixed vegetation | too deep for shorebirds | 0 | 0 |
| 9/20/2019 | deep water, dabbling ducks, mats of algae on open water, mixed vegetation | too deep for shorebirds | 0 | 0 |
| 10/18/2019 | deep water, ducks, waterfowl and waders, mixed vegetation | too deep for shorebirds | 0 | 0 |
| North | | | | |
| 8/2/2018 | variable deep water, dense (80%) sesbania and cut grass | too deep for shorebirds | 0 | 0 |
| 8/15/2018 | variable deep water, dense (80%) sesbania and cut grass | too deep for shorebirds | 0 | 0 |
| 8/29/2018 | variable water 4-10 inches, 70% sesbaina and cutgrass | too vegetated in low areas | 2 | 1 |
| 9/12/2018 | variable water 4-10 inches, 70% sesbaina and cutgrass | too vegetated in low areas | 0 | 0 |

| | | | | |
|--------------|---|----------------------------|---|---|
| 9/27/2018 | variable water 4-10 inches, 70% sesbaina and cutgrass | too vegetated in low areas | 0 | 0 |
| 10/12/2018 | variable water 4-10 inches, 70% sesbaina and cutgrass | too vegetated in low areas | 0 | 0 |
| 10/26/2018 | variable deep water, 70% sesbaina and cutgrass | too deep for shorebirds | 0 | 0 |
| 4/19/2019 | variable deep water, dense cut grass and vegetation in interior of unit | too deep for shorebirds | 0 | 0 |
| 8/1/2019 | variable deep water, dense cut grass and vegetation in interior of unit | too deep for shorebirds | 0 | 0 |
| 9/20/2019 | variable deep water, dense cut grass and vegetation in interior of unit | too deep for shorebirds | 0 | 0 |
| 10/18/2019 | low water levels with mud flats, mixed cut grass | good shorebird habitat | 0 | 0 |
| South | | | | |
| 8/2/2018 | variable water levels, deep in channles, sesbania dense throughout | too vegetated in low areas | 0 | 0 |
| 8/15/2018 | variable, deep at edges, crispy mud throughout, dense sesbania | dried to control sesbania | 0 | 0 |
| 8/29/2018 | variable, deep at edges, crispy mud throughout, dense sesbania | dried to control sesbania | 0 | 0 |
| 9/12/2018 | variable, deep at edges, crispy mud throughout, dense sesbania | dried to control sesbania | 0 | 0 |

| | | | | |
|------------|--|-----------------------------|----|---|
| 9/27/2018 | variable, deep at edges, crispy mud throughout, dense sesbania | dried to control sesbania | 0 | 0 |
| 10/12/2018 | variable, deep at edges, crispy mud throughout, dense sesbania | dried to control sesbania | 0 | 0 |
| 10/26/2018 | variable, deep at edges, crispy mud throughout, dense sesbania | dried to control sesbania | 0 | 0 |
| 4/19/2019 | variable with some deep areas and mud, dead sesbania and mixed veg | water increased | 33 | 5 |
| 8/1/2019 | deep water and dense sesbania throughout | flooded to control sesbania | 0 | 0 |
| 9/20/2019 | deep water and dense sesbania throughout | flooded to control sesbania | 0 | 0 |
| 10/18/2019 | deep water and dense sesbania throughout | flooded to control sesbania | 13 | 2 |