AVIAN USE OF BUCKTOWN ARTIFICIAL WETLAND

WITH SPECIAL EMPHASIS ON THE POPULATION DENSITY AND REPRODUCTIVE SUCCESS OF THE RED-WINGED BLACKBIRD

Male Red-winged Blackbird, St. Charles Parish, photo by Elizabeth Wiggins.

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INTRODUCTION

The purpose of this study was to assess the habitat quality of the artificial wetland in Bucktown in the New Orleans metropolitan area for marsh birds. Marsh birds are high on the food webs of wetland ecosystems, typically consuming many fish, amphibians, crustaceans, insects, and other vertebrate and invertebrate prey. The presence of a full suite of marsh avifauna suggests a functional wetland ecosystem, while the absence of wetland birds would suggest that the site is less successful. While mere species presence provides some indication of habitat quality, the abundance of those species is a more stringent test. Even more insightful is information on whether birds are able to successfully raise young or overwinter at the site.

CATALOGING SPECIES USING THE WETLAND

Methods used to sample wetland avifauna

Starting in 2007, I visited the Bucktown Wetland periodically to attempt to catalog the species using the site. Birds were detected by walking the edges of the marsh and scanning its interior. Noises that are known to attract various songbird species ("spishing") or to elicit vocalizations from rails (sharp clapping of hands) were used to attempt to lure secretive species into revealing themselves. Visits were made at a variety of seasons in order to search for nesting species, wintering species, and migrants using the site during passage. From May to July of 2011, twelve visits were made at intervals of ≥ 4 days, on each day walking the entire perimeter and penetrating the shrub border to scan the interior on both the east (one place) and northwest (two places) sides. Visits both in 2011 and earlier typically lasted for 15-30 minutes. In addition, supplemental observations from members of the local bird-watching community were solicited to add to the information available.

The Bucktown wetland contains two distinct habitats attractive to wetland species: a vegetated marsh habitat of mixed herbaceous and shrub cover, and a small open tidal cove that during low water can have substantial exposed mud flats. The vegetated marsh is primarily of relevance to wetland songbirds and to rails and bitterns, which habitually conceal themselves in dense vegetation. The cove is more suitable for large wading birds, which tend to favor areas with larger open water or mud surfaces while foraging.

Results: species detected

The Bucktown wetland has succeeded in attracting a variety of wetland bird species in the past five years (Table 1). Large waders in the heron/egret family have been present on 81% of visits to the site, using the cove and sometimes perching on stakes out in the marsh. The most regular species to use the site has been the Yellow-crowned Night-Heron (see Table 1 for Latin name), but there have been multiple sightings each of Great and Snowy Egrets and Tricolored

(*Egretta tricolor*) and Green Herons (*Butorides virescens*). Based on systematic observations I have made at a series of 95 sites in marshes of southeast Louisiana in both 2010 and 2011 (Yaukey, unpublished data), the rate of usage of the cove area by one or more large waders appears to be higher than would be expected for a random shoreline area of similar size in the wetlands away from the city.

Species using the site in winter and summer are of greatest interest because they are not occurring as mere passage migrants, and thus are more likely to be making prolonged stays. The dominant wetland species using the vegetated portions of the site so far have been Red-winged Blackbirds in the nesting season, and Swamp Sparrows in the winter season. Although both these species are scarce within the urban landscape, they are not obligate wetland species, and commonly occur on rank weedy land, along brushy edges of agricultural fields, etc.. The attractiveness of the site to obligate wetland species is of greatest interest; in this light, observations of both Sora and Clapper Rail here in the winter of 2009-2010 are encouraging. Another obligate wetland species, Marsh Wren, has been recorded more than once. Finally, single Least Bitterns (*Ixobrychus exilis*) were found on three dates in June-July of 2011 (including observations by Glenn Ousett and Bruce Baird), probably representing the same individual or possibly a nesting pair.

The Bucktown Wetland also appears to be targeted as a feeding area by aerial insectivores at some times. For instance, throughout a ~30 min visit on June 2, 2011, Chimney Swifts (*Chaetura pelagica*; peak 5 at once), Purple Martins (*Progne subis*; peak 5), and Barn Swallows (*Hirundo rustica*; peak 3) were foraging low over the marsh. On June 10 a similar phenomenon was observed, with peak counts of 5 swifts, 4 martins, and 2 Barn Swallows. Smaller concentrations were noted on various other days.

Observations during April-May and August-November could potentially pertain to passage migrants, whose occurrence does not necessarily provide a strong indicator of habitat quality. Migrants at times occupy poor habitats merely for lack of other alternatives in an area in which they are forced to pause during a migratory journey. Nevertheless, the presence of ten Soras (*Porzana carolina*) on one April visit was a remarkable concentration for this obligate wetland inhabitant. It is quite possible that the Bucktown wetland may have survival value for migrants that have to spend a day or more in the unaccommodating urban landscape of New Orleans during their passage

Other candidates for occurrence.

Five wetland species that occur frequently in the Lake Pontchartrain-Bayou Sauvage area for which the habitat structure of the Bucktown Wetland would appear to be well suited have yet to be detected there. These are the Great Blue Heron (Ardea herodias), White Ibis (*Eudocimus albus*), Mottled Duck (*Anas fulvigula*), and Virginia and King Rails (*Rallus limicola* and *R. elegans*). In addition, the Common Yellowthroat (*Geothlypis trichas*) has not been found except

for a single singing bird in June 2011 (Glenn Ousett) that was only detected on one day. Most of the other wetland species that have not yet been recorded are unlikely to use the site much if at all, because of characteristics of its habitat. Bucktown Wetland appears to lack sufficient open water and/or mud for loons, grebes, Double-Crested Cormorant (*Phalacrocorax auritus*), Anhinga (*Anhinga anhinga*), Common Moorhen (*Gallinula chloropus*) or Purple Gallinule (*Porphyrio martinica*), or to be used regularly by shorebirds (plovers, stilts, yellowlegs, sandpipers, etc.), terns or gulls. The habitat appears to have too many shrubs for Seaside Sparrow (*Ammodramus maritimus*), and may also be too fresh. The site is probably both too small and too lacking in open water for American White Pelican (*Pelecanus erythrorhynchos*), American Bittern (*Botaurus lentiginosus*), and any overwintering migratory duck species. The locally nesting Wood Duck (*Aix sponsa*) requires trees or artificial nest boxes, and more open water. Glossy and White-faced Ibises (*Plegadis falcinellus* and *P. chihi*) would be candidates to use the cove if it were closer to the periphery of the urban area, but typically do not occur this far into the city even as flyovers. In addition, the Clapper Rail and Marsh Wren have only occurred at Bucktown in the non-breeding season despite nesting in the marshes of southeast Louisiana.

POPULATION DENSITY AND REPRODUCTIVE SUCCESS

High population density is presumably a better indication of habitat quality than is mere presence of a bird species. The presence of numerous individuals suggests that a site has sufficient resources to support them, and that the species' presence cannot be accounted for merely by a wandering or aberrant individual. Furthermore, the ability of birds to successfully raise young at the site, a very demanding activity requiring food resources, suitable cover for nest placement, and other factors, should be an even better indicator of quality.

Study species

In order to assess habitat quality, a species must be selected which is numerous enough to provide sufficient data that trends can emerge from the random noise inherent in bird counts (e.g., random behaviors of birds making them detectable one visit but not another), and which can provide sufficient nesting territories to estimate seasonal reproductive success. Because of the relatively small size of the Bucktown Wetland, the only species with a sufficient number of nesting individuals to allow such an analysis was the Red-winged Blackbird. While the half dozen territorial males and ten or so nesting females provided more information than available for any other species, they were still too few to allow rigorous testing of statistical patterns. Statistical variation was instead addressed informally by comparing data from Bucktown with data collected in parallel fashion at fourteen other "control" locations in a more natural context.

The Red-winged Blackbird is a numerous and widespread nester across North America. The species is partially migratory; local resident populations in southeast Louisiana are joined in winter by birds from farther north. Nesting territories are left in the winter to form flocks in

wetlands and agricultural areas- the species is also absent from Bucktown in the winter. The species has a polygynous mating system- each male can potentially have a harem of females nesting at once in a territory he defends. A female almost always stops nesting for the season after its first fledged brood, but failed nests may stimulate another attempt (Yasukawa and Searcy 1995).

Study areas

The habitat structure of the Bucktown Wetland has been described elsewhere (Hester and Willis 2007). To put the information on blackbird use of this site into perspective, a series of study sites were scouted in less urbanized areas of Orleans and Jefferson Parish. I attempted to make a candidate list of all mixed herbaceous/shrubby wetland areas of habitat structure similar to the Bucktown Wetland that were accessible by vehicle, and could be penetrated on existing trails or walkways to limit disturbance and observer noise. Additional criteria included freedom from road noise, and availability of sufficient habitat to potentially hold a dozen or more blackbird territories. Candidate areas initially identified included the LaBranche wetlands (accessed from Kenner), areas near the foot of the Huey P. Long Bridge in Nine Mile Point and Bridge City, Bayou Segnette State Park, Bayou Sauvage National Wildlife Refuge, and areas along Highway 90 in the vicinity of Chef Pass and the Rigolets.

After visiting several areas, I settled upon one site in Bayou Sauvage NWR (Madere Marsh boardwalk on Hwy 90), and the wetlands flanking the land bridge traversed by Hwy 90 from Chef Pass northeastward for 5 miles (8 km). These areas were superior in the similarity of their habitat structure to the Bucktown Wetland (relative amounts of shrub and herbaceous cover), in their accessibility on foot, and in their high densities of Red-winged Blackbirds. Within the area east of Chef Pass, I selected access points to the marsh edge that had relatively passable abandoned camp driveways, and spaced these out on both the southeast and northwest sides of Hwy 90 with adjacent sites on the same side separated by intervals of ~0.2 miles (0.3 km) or more, avoiding posted land or driveways that appeared to have been in recent use. In this fashion I was able to establish 13 count locations east of Chef Pass, including one on Marques Road behind the University of New Orleans boat house. The pair of points farthest out Highway 90 were both at the same site, one near the landward marsh edge and one 120 m farther out into the marsh along an unpaved driveway. All other access locations had single count points.

Estimating bird density

Blackbirds were counted using semi-circular point counts of 4 minutes duration. At Bucktown, I stood on the edge of the wetland and counted all individuals detected by sight or sound within 25 m within the marsh, effectively creating a semi-circular count area at each counting point. Count stations were placed near the midpoint of each of the three sides of this wetland, which is roughly triangular in shape. On the east side, I set up a small platform (made from an abandoned drum) on the inner edge of the shrub border to enable viewing above the

vegetation. On the west side, I beat a small trail in through the shrub border to allow viewing from inside the shrubby edge. At the 14 sites in New Orleans East, each semicircular count area was situated with the observer standing along an approximately linear edge of a patch of apparently suitable Red-winged Blackbird habitat of mixed shrubs and herbaceous growth with good visibility, with the count area extending radially 25 m into the targeted habitat area to form a semi-circle. In most cases I walked as far away from Highway 90 as possible, reaching the open waterway on which a former camp had been located, and turned so that the waterway was at my back. All counts at Bucktown and in New Orleans East were made during the morning hours, with both early and late morning visits to both areas. I evaluated bird density and searched for indications of successful nesting on visits spaced at 4 day intervals throughout June, and made additional visits in May (31 May in New Orleans East, 19 and 30 May at Bucktown) and in July (4 and 14 July in New Orleans East; 2, 12, and 20 July at Bucktown) which were used exclusively to look for evidence of nest success.

Estimating reproductive success

After initial forays into the Bucktown Wetland searching for blackbird nests in May, I concluded that the searching process would trample an unacceptably large amount of herbaceous vegetation and break too many branches of the shrubs. By inadvertently opening trails through the vegetation, I might have drawn predators into contact with blackbird nests that I had found. I consequently switched my sampling strategy to a procedure similar to that introduced by Vickery et al. (1992) that is less intrusive and relies more on making inferences of nesting status and success using behavioral cues from adults and detections of begging nestlings or fledged young. I have used similar methods successfully in ongoing studies of Northern Mockingbird (*Mimus polyglottus*) reproduction in urban residential New Orleans. This procedure placed emphasis on watching females for behavior indicative of nest-building or feeding of young (carrying food), and listening and looking for recently fledged juveniles. Juveniles are streaked brown and appear similar to adult females, but have tails that remain obviously shorter than those of adults for 2-3 weeks after fledging. Even after their tails grow to full length, they can be distinguished readily from adult females by their buffy wing bars (tips of the greater secondary coverts), and buffy streaking on the back.

On each visit to each site, I mapped the locations of adult males and females, making notations of behaviors indicative of nesting (e.g., carrying nest material or food for young). The maximum count of females on a single visit over the course of the season was used as an estimate of the number present at each site. While this presumably underestimates the actual number to some extent, such biases were presumed to be similar at all sites. On each visit I also looked for young that had fledged recently. The ratio of such juveniles to the number of adult females provided a measure of reproductive output per female. The species typically raises only one brood per year (Yasukawa and Searcy 1995), which minimizes possible complications from multiple broods being produced by the same female.

Results: Population density

Six male Red-winged Blackbirds occupied territories at the Bucktown Wetland in 2011. On point counts, their density compared favorably to their density in more natural wetlands in New Orleans East (Table 2). For territorial males, the three point count sites at Bucktown produced the highest count of the study, another count that was exceeded at only one control site, and a third exceeded at only three. For females, Bucktown again produced the highest count, as well as another exceeded by only two control sites. However, the third Bucktown site was below the median (exceeded by eight controls).

Results: reproductive output

Red-winged Blackbird was the only wetland bird species confirmed nesting at the Bucktown Wetland. However, one pair of Eastern Kingbirds (*Tyrannus tyrannus*) nested successfully in the shrub border, and sightings of single Least Bitterns on three occasions in June and July suggests that a pair may have been nesting (nesting behavior by this secretive species could easily have gone undetected). One juvenile Green Heron was also sufficiently young to suggest that its nest may have been somewhere in the shrub border of the site.

Only two fledged broods of Red-winged Blackbirds appear to have been produced by the ten or so females at Bucktown, with four individual young detected. Reproductive success at the Bucktown Wetland was low relative to the fourteen sites in New Orleans East overall (Table 3). At 0.40 juveniles per female, Bucktown only fared better than four of these more natural sites.

DISCUSSION

This study has provided an initial assessment of the habitat quality of the Bucktown Wetland for wetland bird species. Data obtained so far are encouraging in the variety of wetland species that have been attracted, and the high densities of Red-winged Blackbirds in summer and Swamp Sparrows in winter. However, blackbird reproductive output appeared to be low. The fact that the reproductive success of the blackbirds was low compared to more natural wetland control sites is less encouraging than the variety of species reported and the density of blackbirds, but it is possible that this represents merely a single bad year rather than a persistent problem with the quality of the site. A single predator could potentially produce a depression of nesting success in an area of this size in a single nesting season. To gain further insight, in future summers it might be productive to assess nest feeding rates by viewing females making food-carrying flights. These are typically easily viewed from the marsh edge. The rate of feeding could thus be compared to that at control sites, again without actually searching for nests and damaging habitat or creating tails attractive to predators in the process. This could help distinguish whether food availability is low, a potential cause of low reproductive output.

The inlet and cove area is frequently used by large waders, especially during low water when mud is exposed there. However, because of its restricted size it probably will very rarely hold more than six (or so) waders at once. Furthermore, the species using the cove are also at home using the drainage canal system of the city for foraging, and so the availability of the Bucktown Wetland is not expanding their distribution farther into the city than they already occur. Instead, the vegetated portions of the site present the greater opportunity for increasing the occurrence of marsh species within the urban landscape. This is already evident in its heavy use by both Red-winged Blackbirds (summer) and Swamp Sparrows (winter), and its occupancy by some other species in smaller numbers. However, several species that might use a wetland of this size are probably not present because of the abundance of shrubs (replacing herbaceous vegetation) at the site and its lack of open water. Maintaining a greater *Spartina* domination relative to shrubs, and digging channels a few meters wide or small pools that would remain unvegetated (if possible), might increase the chances of occupancy by rails, moorhens and other species. The water edges created by this may also attract additional large waders. Ideally, the banks of such features should be gently sloping enough to allow mud to be exposed during low water.

It is worth noting that the value of the Bucktown Wetland extends beyond its utility to wetland species. Another habitat that is scarce in urban landscapes is dense brush, whether wet or dry. Wetlands with lots of emergent vegetation (herb or shrub) are attractive to some species simply because of the abundance of vegetation they provide near the ground and in the shrub layer. Thus, the site has proven attractive not only to wetland birds but also to species such as the Song Sparrow (*Melospiza melodia)* which has been present here in winter but is absent from typical suburban habitats in New Orleans. Birds preferring brush are also attracted to such areas during migration as stopover habitats, further increasing the value of the site.

LITERATURE CITED

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Table One. Wetland bird species observed at the artificial wetland in Bucktown. Observations made prior to May 2011 are provided in narrative format, and results of visits in the nesting season of 2011 are in tabular form.

Prior to May 2011

July 11, 2007	Birds present at the wetland included 5 male and one female or immature **Red-winged Blackbird** *(Agelaius phoeniceus)*, and one immature **Yellow-crowned Night-Heron** (*Nyctanassa violacea*).
August 11, 2007	No wetland species in the artificial marsh. However, 4 **Yellow-crowned Night-Herons** were on the adjacent lakeshore.
October 27, 2007	Single **Great** (*Ardea alba*) **and Snowy** (*Egretta thula*) **Egrets**, six **Mallards** (*Anas platyrhyncos*; most likely from regionally introduced stock).
January 11, 2008	Four **Marsh Wrens** (*Cistothorus palustris*) and 12 **Swamp Sparrows** (*Melospiza georgiana*) at this date were certainly wintering.
April 12, 2008	Six **Mallards** were presumably descendants of introduced stock. Two **Blue-winged Teal** (*Anas discors*) and most of the ten **Sora** were presumably stopping over briefly on passage. A **Least Tern** (*Sternula antillarum*) found enough open water to hover briefly while prospecting to forage. Five **Swamp Sparrows** and two singing **Marsh Wrens** could have been winterers or passage birds, but two singing **Sedge Wrens** (*Cistothorus platensis*) were presumably passing through as this habitat has more tall shrubs than is usually preferred by this species. Nine male **Red-winged Blackbirds** was the highest number of territories yet for this species.
August 1, 2008	An immature **Yellow-crowned Night-Heron** at the cove. Three male and two female or young **Red-winged Blackbirds** remaining (nesting season over).
February 3, 2010	**Clapper Rail** *(Rallus longirostris)* and **Sora** provided the first clear evidence of the rallid family wintering at the site. Six **Wilson's Snipe** (*Gallinago delicata*) were also unusual for urban New Orleans; the species normally occurs in wet pastures and agricultural fields and matted open marsh. Four **Swamp Sparrows** wintering. **Snowy Egret** in the cove.
April 12, 2010	Two **Sora** reported by Bruce Baird; possibly passage migrants at this date.

Table 1, cont.

January 11, 2011 — 16 **Swamp Sparrows** indicated another year of high wintering density of this species. One **Marsh Wren** was also present, which at such a date appears to have been overwintering**.**

Nesting Season 2011

	5/19	5/30	6/2	6/6	6/10	6/14	6/18	6/22	6/26	7/02	7/12	7/20
Green Heron				1		1	1	1		1	1	
Great Egret	1		1		1	1						
Snowy Egret						2				1	1	
Little Blue Heron											1	1
Tricolored Heron						1			1			
Yellow-cwnd Night-Heron	1	2	1		2	1	1			2	3	2
Black-crwned Night-Heron							1					
Least Bittern				1								
Mallard	1											

Additional Yellow-crowned Night-Herons were found on all visits on the lakeshore bordering the wetland, max. 10 on May 19. Other species on this stretch of lakeshore included Spotted Sandpiper (May 19- spring migrant), Green Heron (max 2 on June 26), Tricolored Heron (adult May 30, juvenile June 10), and Great Egret (June 6 & 18).

Table Two. Red-winged Blackbird counts made at New Orleans East and Bucktown Wetland ("Buck"). N.O. East sites are labelled "North" or "South" to indicate whether on the northwest or southeast side of Hightway 90, and are ordered sequentially northeastward along Highway 90. Territorial males are presented first, then adult females. The mean count calculated for the New Orleans East sites excludes the first visit so that their mean dates of visitation match those of Bucktown.

Bucktown dates			6/6	6/10	6/14	6/18	6/22	6/26	
NO East Dates	5/31-6/1	6/4	6/8	6/12	6/16	6/20	6/24	6/28	Mean 6/4-28
a.									
MALES[a]									
Madere Marsh	1	4	3	1	1	1	3	2	2.1
Marques Road	2	1	0	1	1	2	1	1	1.0
Pole 468[b]	1	1	0	1	0	0	1	1	0.6
Pole 480	2	0	1	2	0	1	0	2	0.9
Pole 490	1	1	0	1	1	1	1	1	0.9
Pole 507	2	2	2	1	0	0	1	0	0.9
Across 507	1	1	1	1	0	1	1	1	0.9
Pole 566	1	0	1	1	1	0	2	2	1.0
Across 582	2	2	1	3	1	1	1	1	1.4
Across 589	3	0	2	1	1	2	2	2	1.4
Blue Tarp	2	2	2	2	2	3	2	2	2.1
Brick Circle	1	0	1	2	1	2	0	3	1.3
Open Dirt	3	1	2	2	3	1	1	2	1.7
Open Track	2	1	7	2	4	1	1	1	2.4
Buck South			2	3	2	2	2	2	2.2
Buck East			2	3	2	0	2	3	2.0
Buck West			3	2	2	3	3	2	2.5
b.									
FEMALES									
Madere Marsh	2	2	1	1	0	0	0	1	0.7
Marques Road	0	0	0	0	1	0	0	0	0.1
Pole 468	1	1	0	0	0	0	0	0	0.1
Pole 480	1	1	1	2	0	3	1	3	1.6
Pole 490	1	1	0	0	0	0	0	0	0.1
Pole 507	2	0	0	0	0	0	2	0	0.3

Table 2,cont.

Across 507	1	1	1	1	0	0	1	1	0.7
Pole 566	1	0	0	3	3	0	2	2	1.4
Across 582	1	1	3	2	1	2	1	2	1.7
Across 589	2	0	2	0	4	4	2	2	2.0
Blue Tarp	1	1	1	1	1	2	2	0	1.1
Brick Circle	1	1	1	2	1	2	1	0	1.1
Open Dirt	2	2	1	2	0	2	0	0	1.0
Open Track	3	0	3	2	2	1	0	3	1.6
Buck South			4	2	1	1	2	0	1.7
Buck East			0	1	0	1	1	2	0.8
Buck West			5	2	3	3	3	1	2.8

[a]Territorial males only.

[b]Poles indicate location by nearest numbered telephone pole; poles are on southeast side of Hwy 90; sites across highway are so labelled (e.g., “Across 589”). “Circle of Brick” and “Blue Tarp” are sites near the north end of St. Catherine’s Island on the northwest side of Hwy 90 where poles are not visible; “Open Dirt” is the large open dirt area on southeast side of Hwy 90 at the north end of the island; “Open Track” is an additional site accessed by walking 120 m out an unpaved track from Open Dirt.

Table Three. Numbers of females, newly fledged broods, numbers of juveniles in those broods, and juvenile:female ratios for Red-winged Blackbirds at each site over the course of the 2011 breeding season.

NO East Dates	females	broods	Juveniles	Juv:fem
Madere Marsh	2	1	2	1.00
Marques Road	2	0	0	0.00
Pole 468	2	1	2	1.00
Pole 480	4	2	4	1.00
Pole 490	1	1	3	3.00
Pole 507	1	2	2	2.00
Across 507	2	1	2	1.00
Pole 566	3	1	2	0.67
Across 582	4	3	8	2.00
Across 589	4	2	4	1.00
Blue Tarp	3	1	1	0.33
Brick Circle	2	0	0	0.00
Open Dirt	3	1	1	0.33
Open Track	3	2	3	1.00
Buck Total[a]	10	2	4	0.40

[a]Includes the areas of the three point counts and intervening areas of the marsh. Control site counts also include areas outside but adjacent to the 25 m point count radius, mainly along the driveways used for access.