A BIRDS AS ART - Wildscape Images Photographer's Site Guide
Merritt Island NWR & Central FL/Brevard County Series

Welcome to our Photographer's Site Guide covering major destinations in Central Florida including Merritt Island National Wildlife Refuge, Canaveral National Seashore and Viera Wetlands as well as other locations you probably don't know about. These locations are in Brevard County, FL famously known as the SPACE COAST, home to NASA's Kennedy Space Center and the annual Space Coast Birding and Wildlife Festival.

Five separate guides with attachments comprise this series. Clicking on one of the links below will bring you to that guide or its attachments. The Guide portion of the series contains the salient details you need to get into the field and start creating images. In the Attachments, you will find additional facts, maps and info.

Central Florida/Brevard County Photographer's Site Guides – PDF Links

Introduction to the Series & Miscellaneous Locations	Guide	Attachments
Merritt Island National Wildlife Refuge	Guide	Attachments
Viera Wetlands	Guide	Attachments
Canaveral National Seashore	Guide	Attachments
Shooting Techniques	Guide	

We hope that you enjoy them and find them useful in your photographic endeavors.

Arthur Morris/BIRDS AS ART – Robert Amoruso/Wildscape Images

A BIRDS AS ART - Wildscape Images
Photographer's Site Guide

Miscellaneous Locations

Merritt Island NWR & Central FL/Brevard County Series

Release 3.0

April 11, 2007

By: Robert J. Amoruso, Wildscape Images

Great Blue Herons – Blue Heron Water Reclamation Facility

About the Merritt Island NWR & Central Florida's Brevard County Photographer's Site Guide

Robert Amoruso prepared the guides in this series. Arthur Morris distributes them exclusively through his BIRDS AS ART website at www.birdsasart.com.

I am currently one of a small group of photographers that co-leads Artie's Instructional Photographic Tours to sites in the United States and abroad. I also conduct Personalized Photographic Instructional Workshops (PPIW's). My workshops are open format meaning that YOU the participant set the agenda. Some of my workshops have helped participants that have never held a camera or had little experience with DSLR's and photographing birds. Other participants are experienced photographers looking to hone a special skill like using flash. It is up to the individual; I welcome all levels.

I think that you will find this series of guides helpful in locating and photographing birds and other natural history subjects at the Merritt Island National Wildlife Refuge and the many wild areas in Central Florida's Brevard County. This guide series includes the following major destinations in Brevard.

Major destinations in separate guides include:

1. **Merritt Island National Wildlife Refuge (MINWR)**, a unit of the US Fish & Wildlife Service.
2. **Canaveral National Seashore**, a unit of the National Park Service (NPS).
3. **Viera Wetlands** or as it is officially known, *South Central Wastewater Treatment Plant*, is one of Brevard County's Wastewater treatments facilities. The wetlands is comprised of a series of impoundments or cells where nitrogen and phosphorous compounds that promote plant growth are removed naturally so that the treated water can be reintroduced into the environment or used for irrigation.

The smaller areas covered in this general portion of the guide currently include:

1. **Parrish Park** – Titusville, A. Max Brewer Memorial Parkway, Titusville. Situated on both sides of SR-406 at the A. Max Brewer Causeway from the east end of the drawbridge to the security gates for Kennedy Space Center.
2. **Blue Heron Water Reclamation Facility** is one of two of Titusville's Wastewater Treatments Facilities. Like Viera Wetlands, it is comprised of a series of impoundments or cells where nutrients are removed before reintroduction of the water into the St. Johns River or its use for irrigation.

This series also includes the following supplementary guide(s):

1. **Shooting Techniques** is a supplementary guide that discusses some of the techniques used to capture the images in the guides and will help you to improve your photography.

Parrish Park

Parrish Park is located in Titusville just after you cross the drawbridge on the A. Max Brewer Memorial Parkway. Situated on both sides of SR-406, the A. Max Brewer Causeway extends from the east end of the drawbridge to the security gates for Kennedy Space Center.

In late 2006, the City undertook a brush (Mangroves and underbrush) removal program making the water visible on both sides of SR-406 when traveling through. In the past, only small cutouts in the brush allowed access to the water.

Prior to this activity, if you were to stop and cross out to the shallow water south of SR-406 you may have found Great Egrets, Reddish Egrets and Great Blue Herons fishing the shallows for fish. Since the brush cover was so thick, you could not see this from the road. This had two effects, it gave the birds cover that drew them in and lessened the human activity there.

One lone photographer in water shoes out in the shallows was not much of a threat and I could photograph them as the sun rose. I would check the spot pre-dawn and many times would find the Great Blue Heron(s) already there. You can shoot them with the sun at your back or reverse position and shoot into the sun to get beautiful silhouettes as the sun's early morning rays turned the water shades of orange, yellow and gold.

In the afternoon this side of the lagoon could still be good but many times the additional human presence keep the birds away. What I see now is that the removal of the cover allows more humans to approach the water easily thereby increasing fishing, canoeing and similar activities. Again, in the mornings I am seeing the Great Blue Herons there pre-dawn. How long the birds will remain is now dependent upon when you show up vs. when others arrive to fish or do whatever. I have also found Black-necked Stilts and assorted waders here.

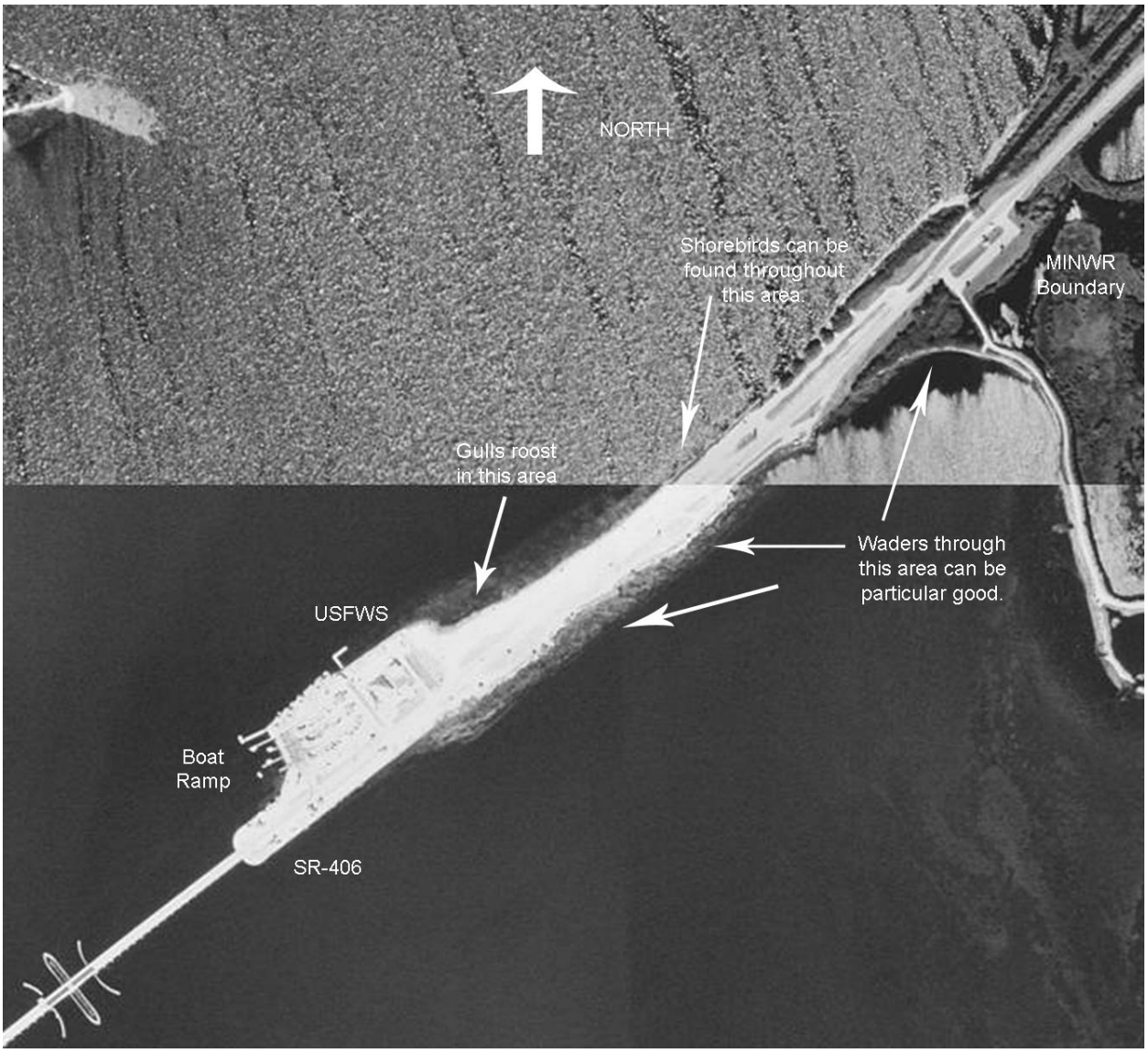
On the North side of SR-406 in the un-paved parking just east of the boat ramp and the USFWS Law Enforcement Building is an area popular with terns and gulls, shorebirds and even ducks. Last week (1/15/07) in the afternoon I saw a good-sized group of Lesser and Greater Scaups in the water. Like most ducks, they move out if you get out of the car but quickly move back into the shallows to resume bathing. Great I thought to myself, Scaup wing flaps. Setting up to shoot low (see the Shooting Techniques guide), I noticed the ducks suddenly fly as a loose dog bounded after them.

That is the second problem here: bathers, jet skis, para-sailing, and on and on. On early winter mornings when human activity is low, your chances of creating some good images are best.

One constant at the north side is the presence of gulls and terns many times of the year even with human activity.

Black-necked Stilt, 4/15/05, Parrish Park South Side – Afternoon
Canon 20D with 500mm f/4 IS and 1.4x TC
1/800 sec, f/11, Mode: Av, Metering: Evaluative, ISO: 400

Parish Park Aerial



"Image courtesy of the USGS"

Blue Heron Water Reclamation Facility

The Blue Heron Water Reclamation Facility is one of two of Titusville's Wastewater Treatments Facilities. Like Viera Wetlands, it is comprised of a series of impoundments or cells that remove nutrients before reintroduction into the St. Johns River or its use for irrigation.

The address for the plant is:

Blue Heron Water Reclamation Facility (BHWRF)
4800 Deep Marsh Road
Titusville, FL 32780
Phone: (321) 383-5642
Fax: (321) 383-5646
Latitude: 28.5504 Longitude: -80.8539
http://www.titusville.com/SectionIndex.asp?SectionID=49

A Google map search will get you directions to the wetlands.

The wetlands are composed of seven treatment cells. Cells 3, 6 and 7 usually have groups of breeding Great Blue Heron and Anhinga. These cells have Cabbage Palms that were growing prior to the berm building and flooding. Cabbage Palms will live a long time submerged in water but without periodic dry periods (which will not happen here), they will eventually die off. For now, these trees are great for photographing great Blue Herons nesting.

On my most recent visit in January of 2007, I did not find any Anhinga nests on the palms but I did find five active Great Blue Heron nests with one offering exceptional photographic opportunities in morning light. Other suspects include White and Glossy Ibises, Great and Snowy Egrets, Cormorants and Anhinga, Coots and Moorhens, Northern Harrier, American Bittern and of course the Great Blue Herons.

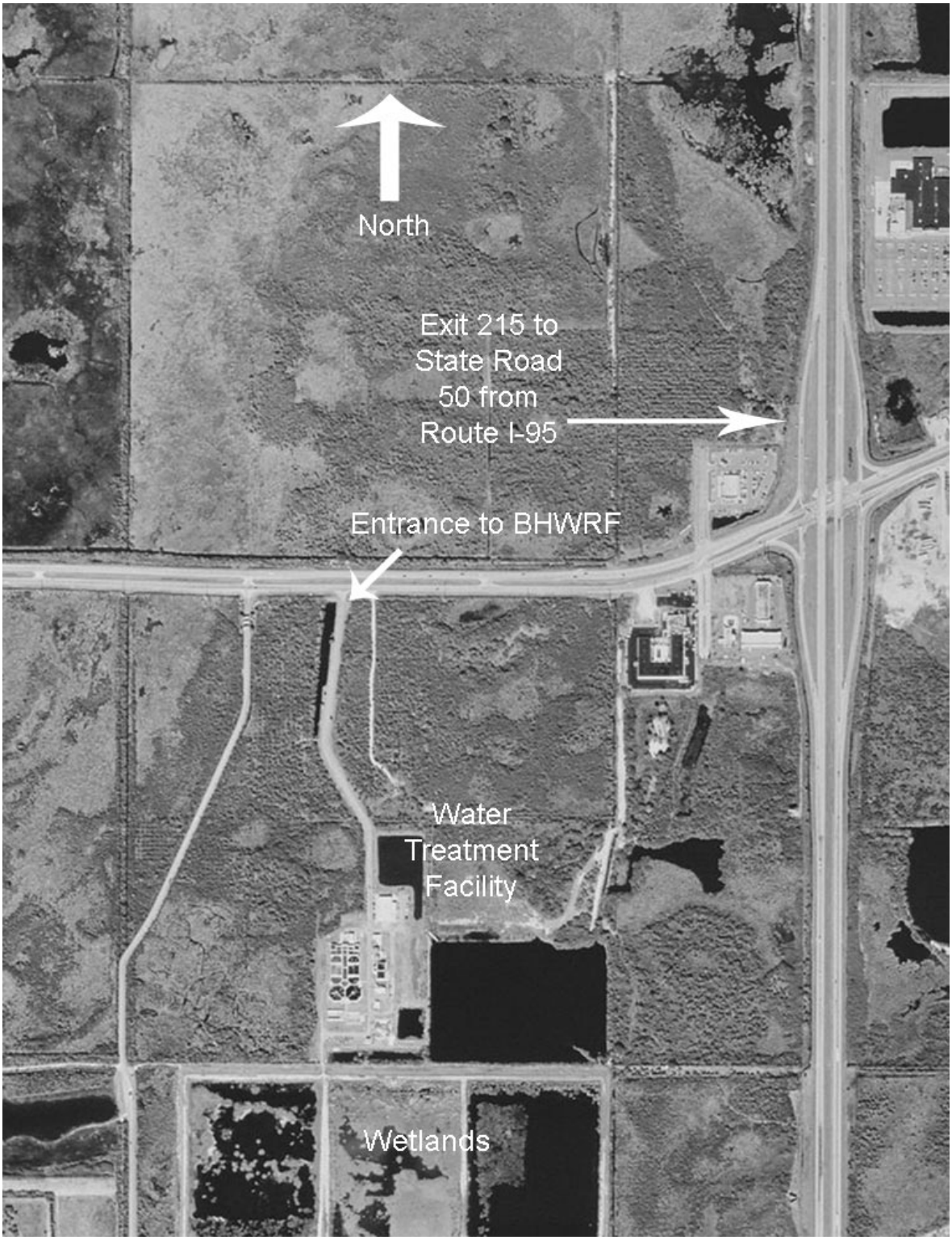
On my visit in March of 2007, three of the Great Blue Heron nests are active and all three have chicks.

The following maps show some of the locations that have been good in the past. My visits to this wetland have not been as frequent in the past I would have liked but my most recent images included below convinced me I need to go more often.

WARNING: The berms are overgrown with vegetation. If you have to pull off to allow someone to pass, be sure you have solid ground to pull off onto as the berms are eroded in many places. Periodically you will find areas to pull off and park. IF like me you are going to stake out a Great Blue Heron nest for hours, I suggest you pull off in one of these areas and walk to your shooting location.

See Attachment 1 for the brochure that is available in the administration building. The scan is not too good because the brochure is printed on colored paper.

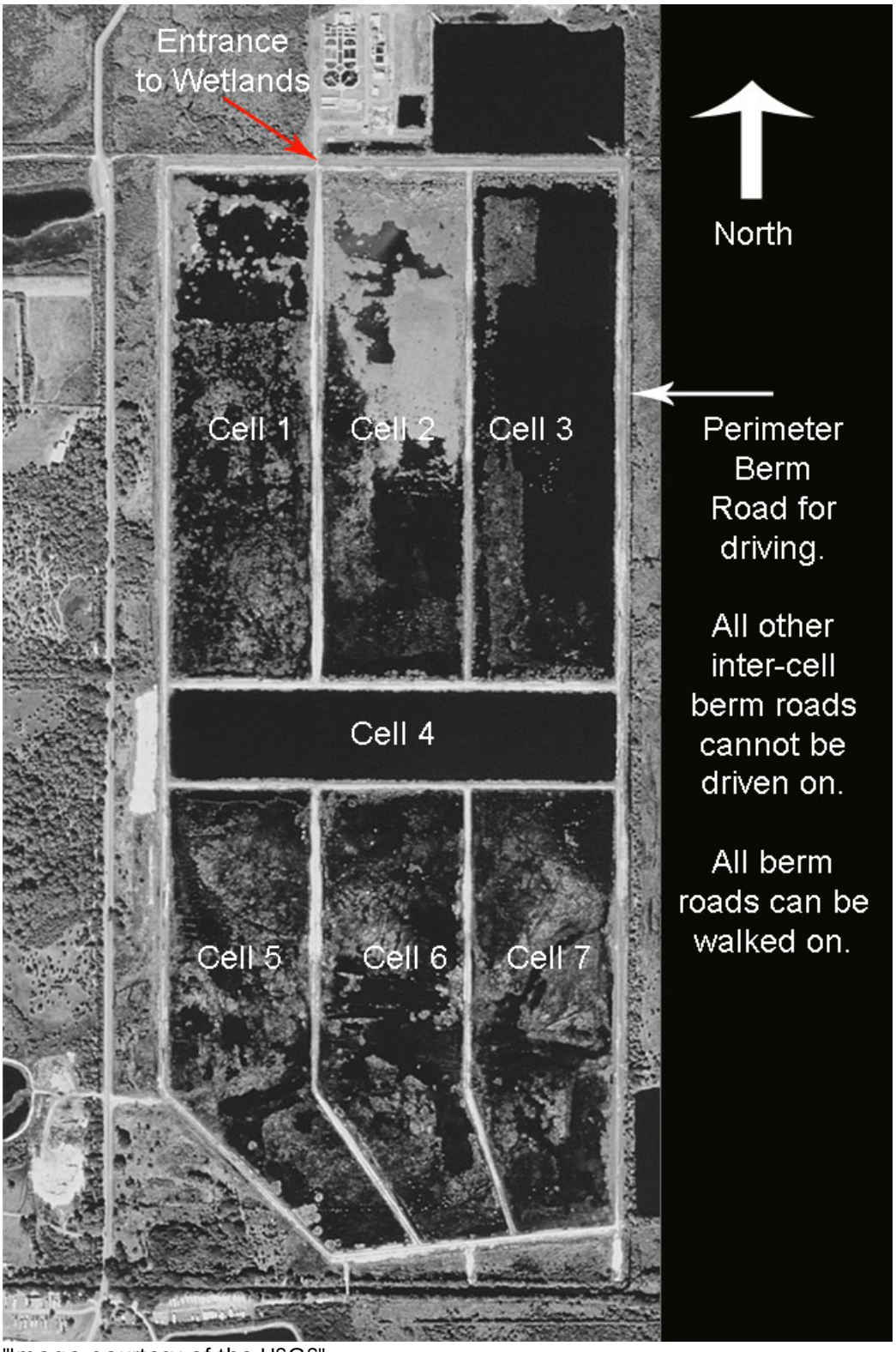
Directions to Blue Heron



"Image courtesy of the USGS"

The first map above illustrates some general directions to the wetlands.

Map of Blue Heron with Hot Spots



"Image courtesy of the USGS"

The map above shows a few Hot Spots you will want to investigate during your visit. According to the map you can obtain at the administration center (Appendix 1), the wetlands perimeter berm road is one way. As you enter the wetlands, you are supposed to turn right. Unfortunately, for the morning that puts you on the wrong side of the cells as you will be then looking into the sun. Of course if you are just driving to a particular spot, that is not such a big deal. I have seen people driving the perimeter road in both directions however and when I enter on the weekends at 7 AM, I will turn left to first shoot at Hot Spot 1 (**HS1**) and then proceed to Hot Spot 3 (**HS3**). Hey, but what about **HS2** you may ask? More on that later.

The Hot Spots

As I previous mentioned, I have not shot extensively in this wetlands choosing to come at certain times of the year to photograph the nesting Great Blue Herons (GBH). Therefore, I have only a few recommendations for you now but plan on investigating more in the future. New finds will make it into subsequent releases of this guide.

The GBH generally will start building nests and mating in January in the Central Florida area though some variation exists. Incubation is about 25 to 30 days by both sexes. Alternating, both parents will leave to feed and return and feed young by regurgitation. Young are fledged in 60 days and will leave the nest in about 65 to 90 days. [1]

I have provided the breeding timeline so that you may better plan your trips, if you are so inclined, you can photograph the various stages of reproduction, rearing and fledging of the young.

HS1 (Cell 2)

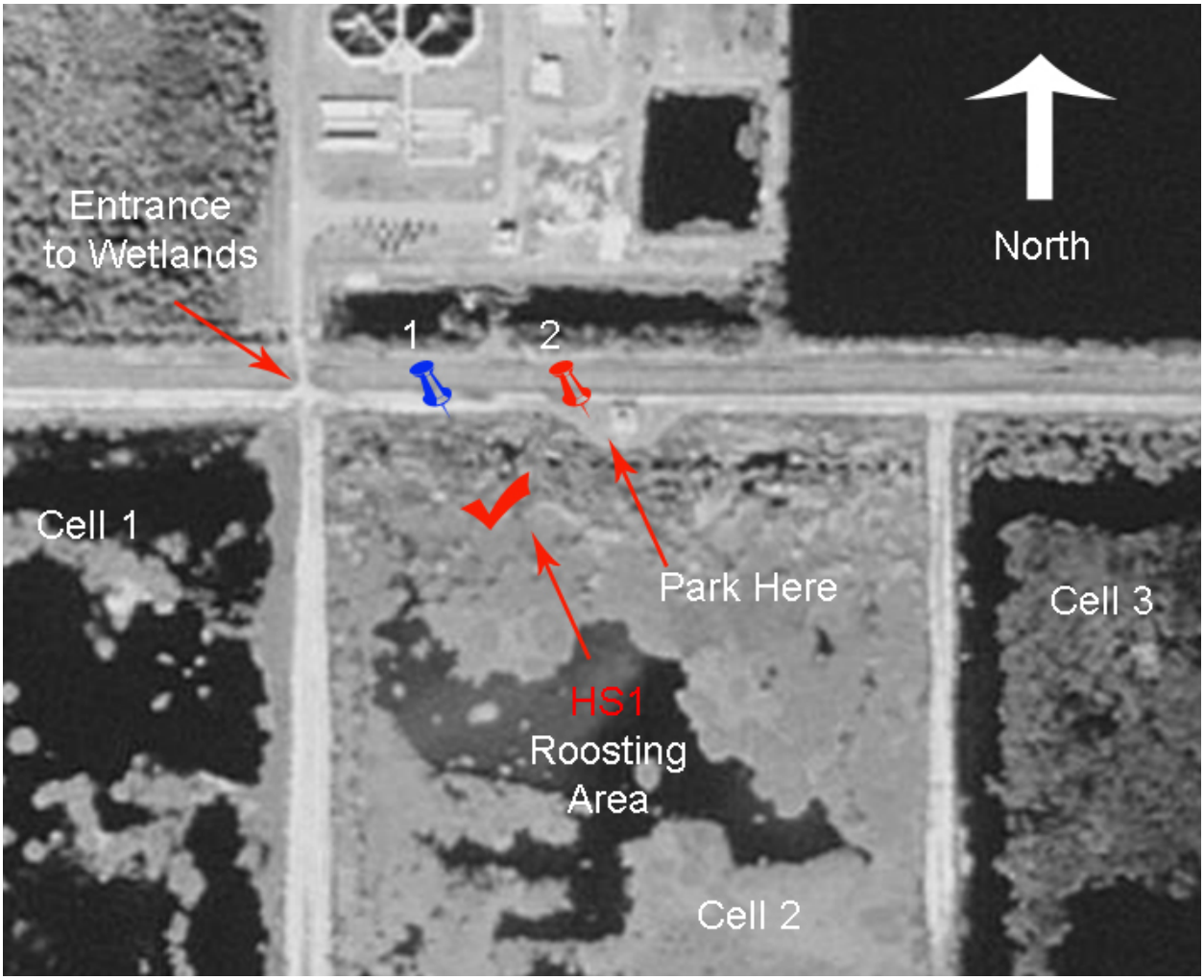
I make this my first stop in the early AM to do pan and flash blurs of the departing waders that roost in the trees at **HS1** (see the map below for this Cell 2 hot spot location). Park as indicated on the map.

After parking, you will see the roosting waders (mostly Anhinga, Ibis and Great Egrets). You have two basic options regarding where to stand. If you stand at "Push Pin 2" on the map below, you will have the early morning glow of the western sky as a background. On my last visit (January 2007) I stood at **PP2** and a majority of the departing birds flew north and west so I had a good shot of the behinds though some flew parallel to my location. In this case, "Push Pin 1" location would have been better. On this particular morning, there was a strong northwest wind and if I have paid a bit closer attention to the wind's direction, I would have been at **PP1** and not **PP2**.

The image below of the Ibis was taken looking west and the Great Egret looking east while standing at **PP2**. Remember to give yourself room go get the bird in the frame; so chose the correct focal length or move to the proper location. The Great Egrets leave first and singularly. The White Ibises generally leave en mass ascension with a few stragglers both before and after the mass fly-off; so be ready.

[1] *Lives of North American Birds*, © 1996 by Kenn Kaufman

Map of Blue Heron with Cells



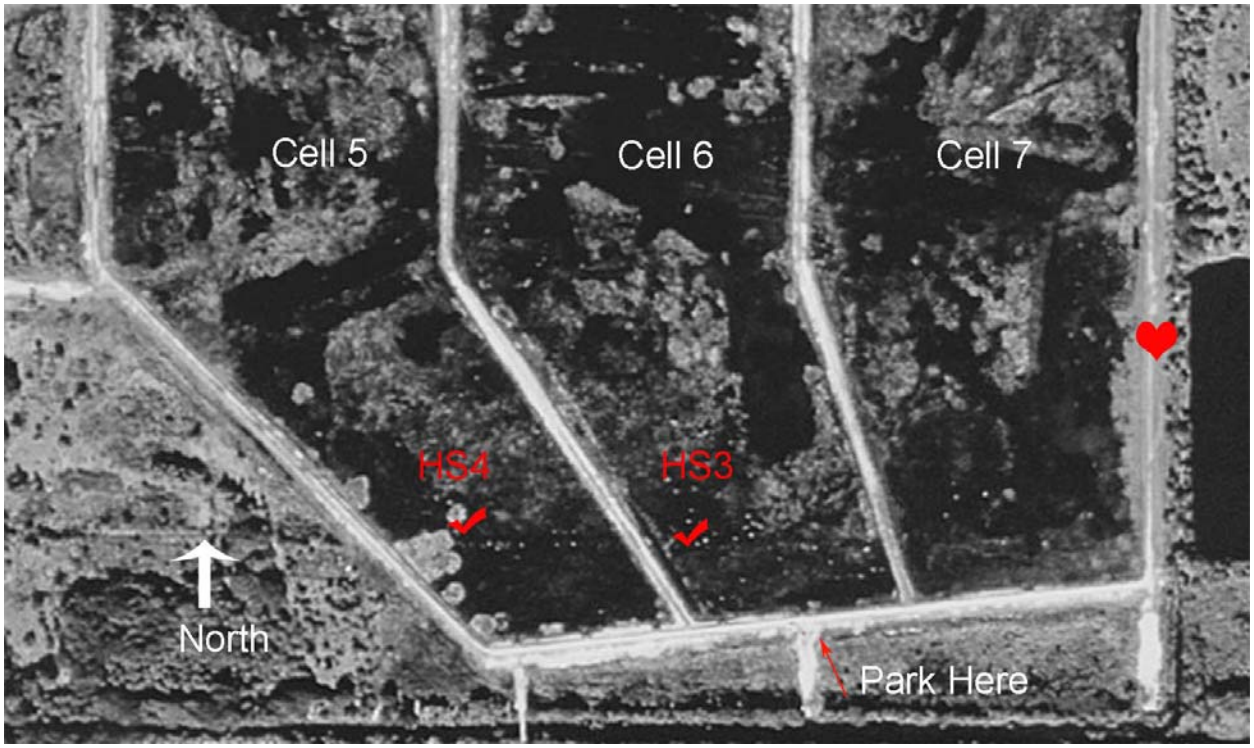
"Image courtesy of the USGS"

HS2 (Cell 3)

In January of 2007, there were two active GBH nests in Cell 3. One of the nests is far off and you will need a lot of lens to get a decent shot. Canon 1D Mark IIn (1.3x crop factor) with 600mm f/4 IS and a 2x TC kind of reach. You may be able to get some good flight shots of the GBH going out to search for sticks for nest building and feeding. The other nest is close enough to make some great photographs of the herons coming and going. Long lens are still required for this nest that is located about in the middle of the cell (north and south) and on the east side. As of March 2007, this nest was active and the herons had chicks.

This site has potential so do not overlook it.

Map of Blue Heron with Cell 5, 6 and 7 Hot Spots



"Image courtesy of the USGS"

HS3 (Cell 6) & HS4 (Cell 5)

HS3 has an active (January 2007) Great Blue Heron nest. On my visit on January 20, 2007, the male was busy gathering sticks and bringing them back to the female to build the nest. One copulation occurred while I was there but with their backs to me so it was not a good opportunity. Otherwise, as you can see from the images below, it was a great morning.

On my January 2007 visit there was a nest in a low palm tree at **HS4** that may be visible for afternoon shooting from the perimeter road (to the left or west of the **HS4** checkmark). As of March 2007, I could not spot any activity at this nest.

To photograph at the **HS3** nest, park where I have indicated (this gets you off the road) and walk about 100 feet west along the berm road. This will put you in line with the sun (you shadow pointing towards the nest. Even with the North wind that morning, the male GBH was landing parallel to my location... good luck on my part. When the female finally flew of to feed, I presume, around 10 am that signaled the end of a great morning of photography.

Great Blue Herons Nest Building, 1/20/07
Canon 1Ds Mark II with 600mm f/4 IS and 2x TC
1/1000 sec, f/10, Mode: Manual, Metering: Evaluative, ISO: 400

Great Blue Heron Returning to Nest with Branch, 1/20/07
Canon 1Ds Mark II with 600mm f/4 IS and 2x TC
1/1250 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

I returned to the entrance by driving from my parking location right (east) and then turned left (north) to again have the sun at my back as I scanned the side of the cells for any photo ops.

About where I located the "heart" in the above map in **Cell 7**, I came across an American Bittern. I had my 1D Mark IIn with a 300mm f/2.8 IS and 2x TC on my lap. Since the body of the Bittern was obscured by grass, the 600mm focal length was just perfect for the close-up head portrait below. Exposure compensation of -1/3 stop in Av mode caused a bit of Red Channel overexposure (to be expected in the predominately red morning sun) but nothing that was a big deal. Canon Evaluative Metering in full sun generally needs only a -1/3 stop exposure compensation.

American Bittern, 1/20/07
Canon 1D Mark II n with 300mm f/2.8 IS and 2x TC
1/2000 sec, f/8, Mode: Manual, Metering: Evaluative, Exp comp: -1/3, ISO: 400

During my visit in March of 2007, I found a Great Blue Heron nest in **Cell 7** with chicks. It is about 1/3* of the way down the east-side berm road when traveling south on the road. Look to the right (east) to see it.

* "1/3 of the way down..." refers to the length of Cell 7 and not the complete length of the east-side berm road.

BIRDS AS ART - Wildscape Images
Photographer's Site Guide

Merritt Island NWR & Central FL/Brevard County Series

Merritt Island National Wildlife Refuge (MINWR)

Release 3.0
April 10, 2007

By: Robert J. Amoruso, Wildscape Images

Northern Pintail Duck - MINWR

INTRODUCTION – MINWR

The following is taken from the Draft Comprehensive Conservation Plan for MINWR [1]

"Located along Florida's east central coast about 60 miles east of the city of Orlando in Brevard and Volusia Counties, Merritt Island National Wildlife Refuge was established by agreement as an overlay of the National Aeronautics and Space Administration's John F. Kennedy Space Center (see Figure 1).

The over 140,000 acres of the refuge support over 500 wildlife species and more than 1,000 plant species, including a variety of waterfowl, shorebirds, and neotropical migratory birds, as well as 93 federally or state listed species and native wildlife and habitat diversity through a mix coastal habitats, including the beach and dune system, estuarine waters, forested and non-forested wetlands, impounded wetlands, and upland shrublands and forests. Situated along the Atlantic Ocean, the refuge includes three major water bodies, which are all part of the Indian River Lagoon system: Indian River Lagoon, Mosquito Lagoon, and Banana River.

The refuge supports important bird rookeries, a juvenile sea turtle nursery, sea turtle nesting beaches, fish spawning and settlement sites, and important manatee habitat. The refuge is an important overwintering and stopover site for a variety of waterfowl, shorebirds, and neotropical migratory birds. And, the refuge protects historical and archaeological sites. The refuge holds several special designations, including: Outstanding Florida Waters; Essential Fish Habitat; Honorary Historic Landmark of Brevard County, Florida; Great Florida Birding Trail Eastern Gateway; Candidate Marine Protected Area; and Globally Important Bird Area.

A growing human population, along with ongoing development and other human activities, currently threatens the fragile, but highly productive waters of the Indian River Lagoon system and the refuge."

[1]Merritt Island draft CCP and EA available at the following link:
http://www.fws.gov/southeast/planning/PDFdocuments/Merritt%20Island%20Draft/Edited%20Draft%20CCP.pdf

About This Guide and its Nomenclature

Black Point Wildlife Drive has twelve (12) marked stops (see Appendix 3) that are shown on the location maps as **S1**, **S2**, **S3** and so forth. This nomenclature is the only one with a direct relationship to MINWR published documentation. What I mean here is that the Stops on the drive correspond to the stops in the drive brochure (Appendix 3) and the Stops shown on my aerial maps.

Other nomenclature for location (**L1**, **L2** ….), bodies of water (**W1**, **W2** ….), etc. has no direct relationship to wording that the USFWS uses to identify management areas within the refuge. The nomenclature is my own concoction. My identification of bodies of water such as W1, W2, and so forth is patterned around bodies of water that you can see from the road. Therefore, an impoundment can have multiple "W" locations identified with it based on the view from Black Point Wildlife Drive.

Key

- **S1, S2, S3, S4** …. Are the official signed stops along Black Point Wildlife Drive.
- **W1, W2, W3** …. Identify areas of large water bodies.
- **L1, L2, L3** …. Identify locations of interest to photographers; meaning that you may want to stop here.
- **Holes, H or H1, H2, H3** ….. Identify areas I call holes or small pockets of water that frequently draw in wading birds.
- **Berm Road 1, Berm Road 2; BR1, BR2** …. Identify impoundment berm roads that allow foot traffic but not vehicle traffic. These can give you access to the refuge that few people generally use.
- **MF1, MF2**…. Identify mudflats that can be either dry or with shallow water depths. Shore birds, vultures, gull and terns like these locations.

MINWR Site Guide - General

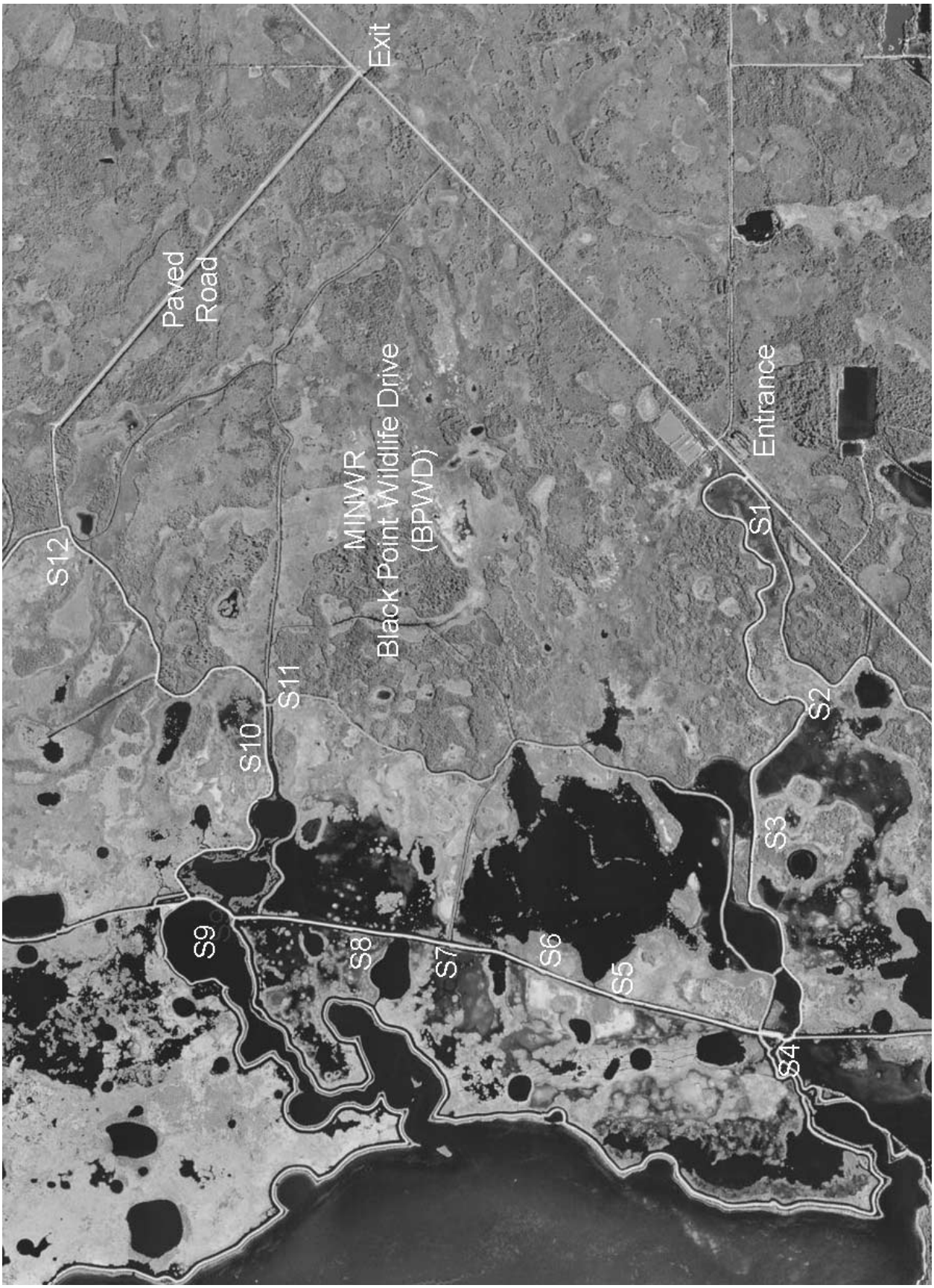
The following areas will be of interest to photographers at MINWR. I have placed them in order of my preference though at any given time, any of these locations will yield excellent opportunities. However, the time of year you visit, recent weather conditions, etc. all play a part as to when any of these locations will be productive. Attached in Appendix 2 is a birding checklist of species commonly seen at various times of the year.

- Black Point Wildlife Drive
- Biolab Road
- Scrub Ridge Trail – For Scrub Jays primarily.
- Visitor's Center – worth a short stop.
- The following are interconnected and may be combined into a single morning or afternoon of shooting.
    - Peacocks Pocket Road
    - Gator Creek Road
    - East Gator Creek Road
    - West Gator Creek Road
    - Catfish Creek Road
- Shiloh Marsh Road

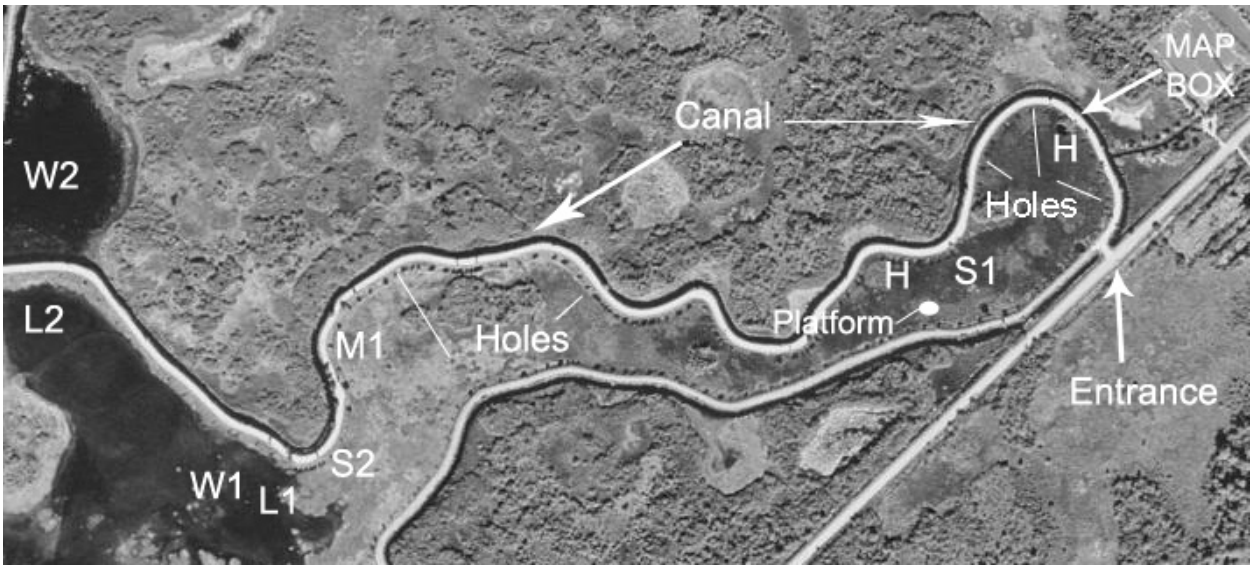
    - Shiloh 5
    - Shiloh 3
    - Shiloh 1 - North
    - Shiloh 1 - South
- Cruickshank Trail
- L Pond Road
- Pump House Road
- Eddy Creek and Dummit Cove Canoe/Kayak Launch

Black Point Wildlife Drive (BPWD) is by far the most popular and famous part of MINWR. From December to April each year, it hosts large populations of migratory birds and waterfowl. Hunting is not allowed in this area of the refuge. During the summer, the non-migratory wading birds such as Great, Reddish & Snowy Egrets as well as Great Blue, Tri-colored & Little Blue Herons are regularly seen here. Numerous species of perching and songbirds including Red-winged Blackbirds may be spotted in bushes and trees on the sides of the impoundment roads and great images may be captured from inside the vehicle.

The overall map of BPWD on the following page identifies the marked stops along the drive. I discuss locations and bodies of water along the drive that I consider significant stopping points along the drive in detail.



"Image courtesy of the USGS"



"Image courtesy of the USGS"

When you first enter BPWD you will come to a **Map Box** on the left hand side (see map above). In it, you may find a brochure describing the signed stops along the drive (see Appendix 3 for this brochure). Right behind the map box is a large hole that may have waders present though overgrowth makes photography difficult.

At **S1 (Stop 1 is the first signed stop on the drive)** you can see the platform that may have either Osprey(s) or Eagle(s) perched on it. Ospreys may nest there. Along the left side of the drive is a series of small holes that may have water in them. They are connected and I believe serve as a part of the mosquito control features of the refuge. On the right is a canal running along the drive that may attract fishing or roosting wading birds, sunning alligators or feeding ducks.

Farther along you will come to what I call the first marsh area (**M1**) that, depending on water levels may attract waders like the Tri-colored Heron below. The biggest problem with this area is that the marsh grasses can obscure the bird. In this case, I got him in the clear but the background is still busy. One option here would be to try a slow shutter speed and create a blur (see Shooting Techniques guide for further information on blurs).

The area between the **Entrance** and **S2** has a variety of native and invasive (such as Brazilian Pepper) vegetation. The grasses are a primary habitat and may provide some interesting backgrounds like the one of the Wood Stork landing below. Unfortunately, I had the Brazilian Pepper in the BG of the image. A similar image with a grass BG would have been preferable.

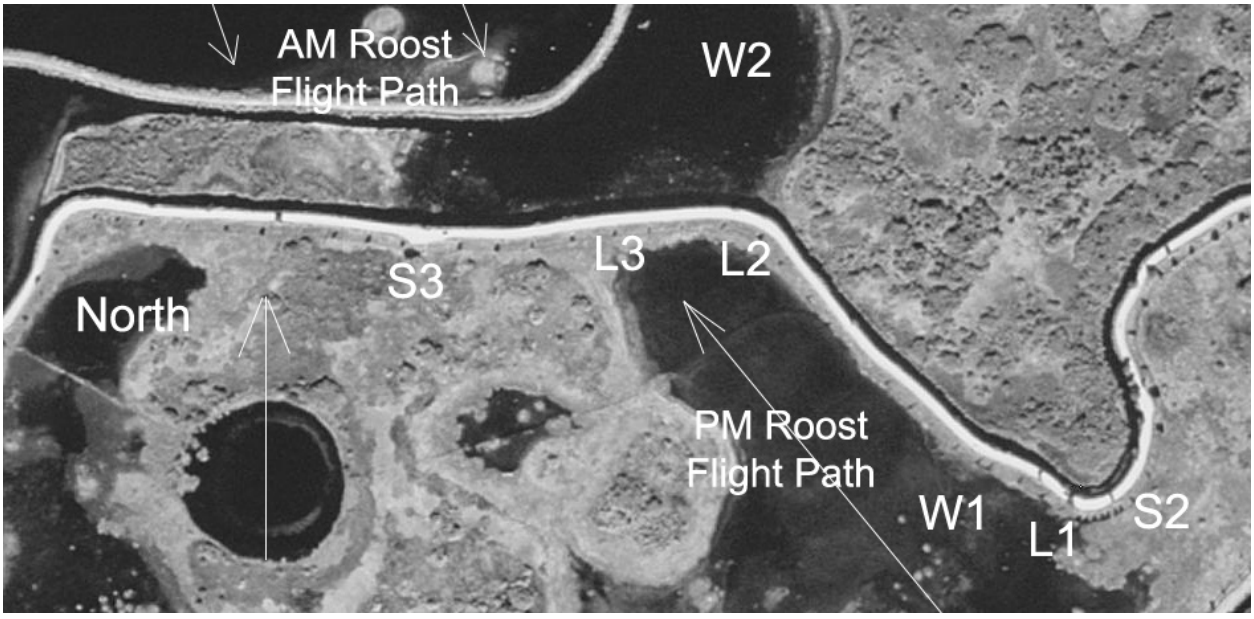
Great Egrets (image below) are a common bird in this area as they hunt for prey among the tall grasses. Watch them as they move back and forth triangulating on their prey. When they stop swaying, they strike like lightning.

Tri-colored Heron, 1-1-05
Canon EOS-1D Mark II with Canon 500mm f/4 IS and 2x TC
1/250 sec, f/11, Av, Evaluative, Exp comp: 1/3, ISO: 500, Flash exp comp: -1 2/3

Wood Stork, 1-1-05
Canon EOS-1D Mark II with Canon 500mm f/4 IS and 1.4x TC
1/500 sec, f/10, Av, Evaluative, Exp comp: 1/3, ISO: 500, Flash exp comp: -1 2/3

Great Egret, 1-1-05
Canon EOS-1D Mark II with Canon 500mm f/4 IS and 1.4x TC
1/400 sec, f/10, Av, Evaluative, Exp comp: 1/3, ISO: 500, Flash exp comp: -1 2/3

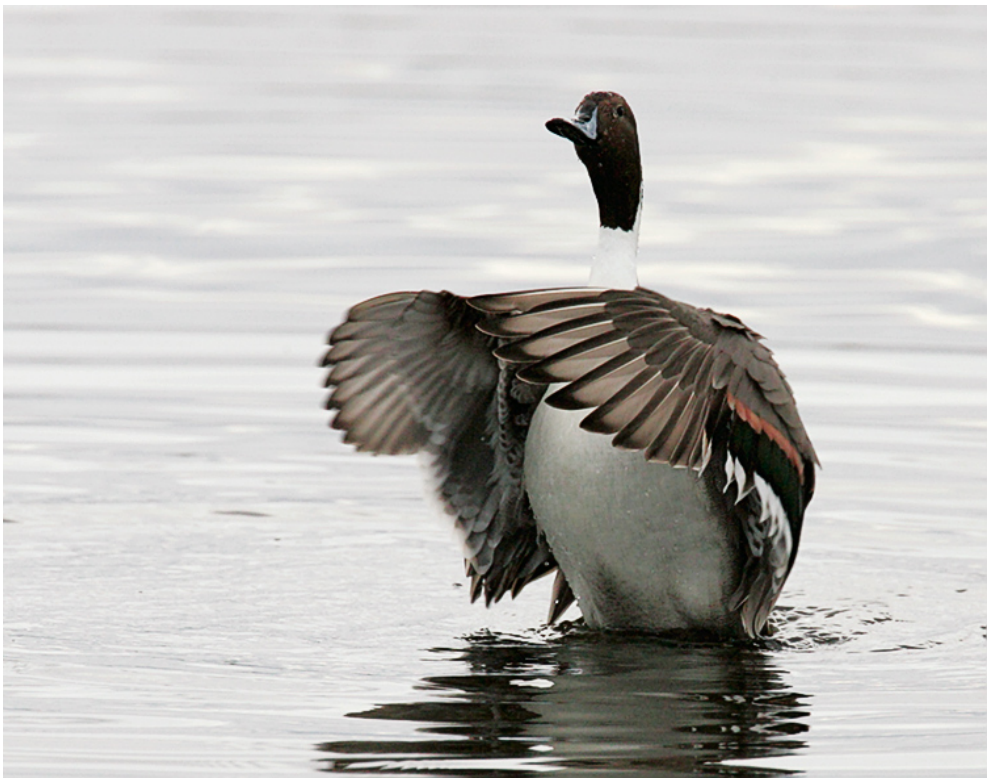
BPWD - Stops 2 to 3



"Image courtesy of the USGS"

At **L1** (in **W1**), good opportunities for migrant ducks including the Northern Pintail and waders like the Snowy Egret on the following page. I will capture the ducks from the car. The waders may be approached from outside the car. The Snowy Egret was photographed using flash-as-main-light hence the mirror like quality to the water. Some may not like the obvious use of flash here.

Snowy Egret, 1/1/05
Canon 1D Mark II, Canon 500mm w/1.4xTC (700mm)
1/400 sec, f/11, Av, Evaluative, Exp comp: 1/3, ISO: 500, Flash comp: -2/3



Northern Pintail Drake, 1/1/05
Canon 1D Mark II, Canon 500mm w/1.4xTC (700mm)
1/1000 sec, f/10, Mode: Av, Evaluative, Exp comp: 1/3, ISO: 500

I captured both images above on an overcast afternoon. This area has its best light in the morning where you will be looking west and the sun will be coming up behind you. However, I have photographed some nice sunsets from this location and backlighting can create some great silhouettes. Another possibility at **L1** or between **L1** and **L2** is to shoot the arrival (PM) and departure (AM) of the roosting waders from the Mangroves discussed in more detail below.

Starting at dawn and about an hour or so before sunset, the waders will be flying to their roosting areas in the mangroves (see large map for location). Their roost is not accessible but the flights to and from presents many opportunities. Both of the images below were taken as the birds returned in late afternoon. You will be standing on the drive between **L2** and **L3**. I will stand near **L3** for the afternoon and **L2** in the morning. That is not a rule. In the mornings, the birds leave before the sun has risen, so you may go were the birds are and shoot from either direction. As the sun rises, the majority of the birds have left, so sun angle is not a big concern for the morning.

In the afternoon, you have the option of having the sun at your back, as was the case in both of the images below or shooting into the sun to capture silhouettes. I do not shoot into the sun here, as I have not liked the results. The Snowy Egrets in the first image below were created using a shutter speed of 1/20 and ISO 200. The shutter speed was set manually here, but Tv mode (shutter priority) may be used and exposure compensation applied. Adjust ISO and Aperture to achieve the correct exposure. 1/15 of a second shutter speed is a good starting point and my favorite pan blur shutter speed. The distance from the camera to the subject has a direct influence on the amount o blur.

Snowy Egrets, Pan Blur, 4/15/05
Canon 20D with Canon 500mm f/4 IS and 1.4x TC
1/20 sec, f/9, Mode: Manual, Metering: Evaluative, ISO: 200
Flash: External E-TTL, Flash exp comp: +2/3

A few paragraphs back I mentioned that you could shoot along the drive between **L1** and **L2**. I have not done it often, but the preferred time would be in the morning with the sun at your back. In the afternoon, you are again shooting into the sun.

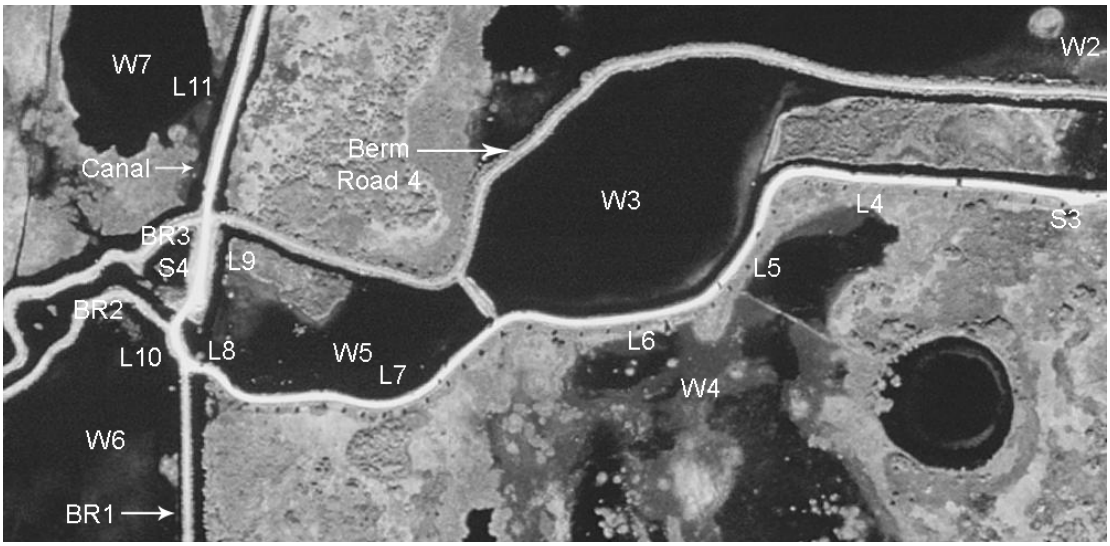
Look for flowing arrangements in the wings demonstrating the rhythmic patterns of the wing beats when creating blurs. Foliage also provides a nice background. Many people will argue that a sharp (relatively speaking) head is a requirement for a successful pan blur. I do not agree. To me, it is about the feeling the image evokes in the viewer and not about any prescribed degree of sharpness.

Nevertheless, sharp images are possible in the afternoon when higher shutter speeds can be used as in the image below of three White Ibises in late afternoon sun. Disclaimer: The sky was created with a bit of digital magic. Using selective color, I fooled around with different color channel intensities to get the coral sky. The sky was a bit pink/coral in color, but I intensified it a lot. To do so, I selected the sky, feathered the edges just one pixel and created a selective color layer mask to influence the sky only.

White Ibises, 3/19/05
Canon 1D Mark II with Canon 500mm f/4 IS and 1.4x TC
1/640 sec, f/8, Mode: Av, Metering: Evaluative, Exp comp: -1/3, ISO: 400
(I underexposed this image. I should have been at +2/3 or +1 Exposure Compensation. I also added canvas in the front of the birds to give them room.)

On the following page are images of the grasses in **W2** that I photograph frequently. During the drought in the first half of 2006, this pond dried up and the grasses went dormant, but have returned as the rainy season came in the latter half of 2006.

Grasses in Early Morning Light
Canon 20D, 28-135mm @ 41mm, 12/31/04
1/400 sec, f/14, Mode: Av, Evaluative, Exp comp: 1/3, ISO: 400



"Image courtesy of the USGS"

I photographed the Reddish Egret below at **L6**. I chose the centered composition to include all of the ripples. The ripples are the compositional element that makes the centered subject work. I could have cropped this even tighter or as a panoramic for an even more dramatic effect. However, here I like the negative space as the refuge was quiet and the space adds to the feeling of isolation. Note the water drop from his bill about to enter the water. That was luck.

Reddish Egret, 6/5/05
Canon 20D with Canon 500mm f/4 IS and 1.4x TC
1/1000 sec, f/8, Mode: Av, Metering: Evaluative, Exp comp: +1/3, ISO: 400
(Exposure compensation should have been +1 or +1-1/3.)

Killdeer, 6/5/05
Canon 20D with Canon 500mm f/4 IS and 1.4x TC
1/1000 sec, f/8, Mode: Av, Metering: Evaluative, Exp comp: -1/3, ISO: 400

I photographed the Killdeer above at **L4**. A common problem at MINWR is trying to separate habitat from the birds. A determined and observant photographer will spot opportunities to capture the subject against a clean background. Work to compose the photograph with habitat by arranging the elements in the scene in a pleasing manner. You do this by changing your perspective. Move around; left and right; up and down. Change the focal length of the lens.

Here I was shooting from the car so as not to spook the Killdeer so there were not many options for moving. In post production I could removed some of the more distracting grasses like the brown stalks coming out the back of the head. I chose here to present the image cropped only so you can see how a confusing habitat can distract from the beautiful Killdeer.

Migrant ducks are common at **L4**, **L5** and **L6** in **W4**. Photographing from the car is a requirement here if you want the ducks to remain close to the road. Look for terns, gulls and Ospreys working the water at **W3** and **W5**.

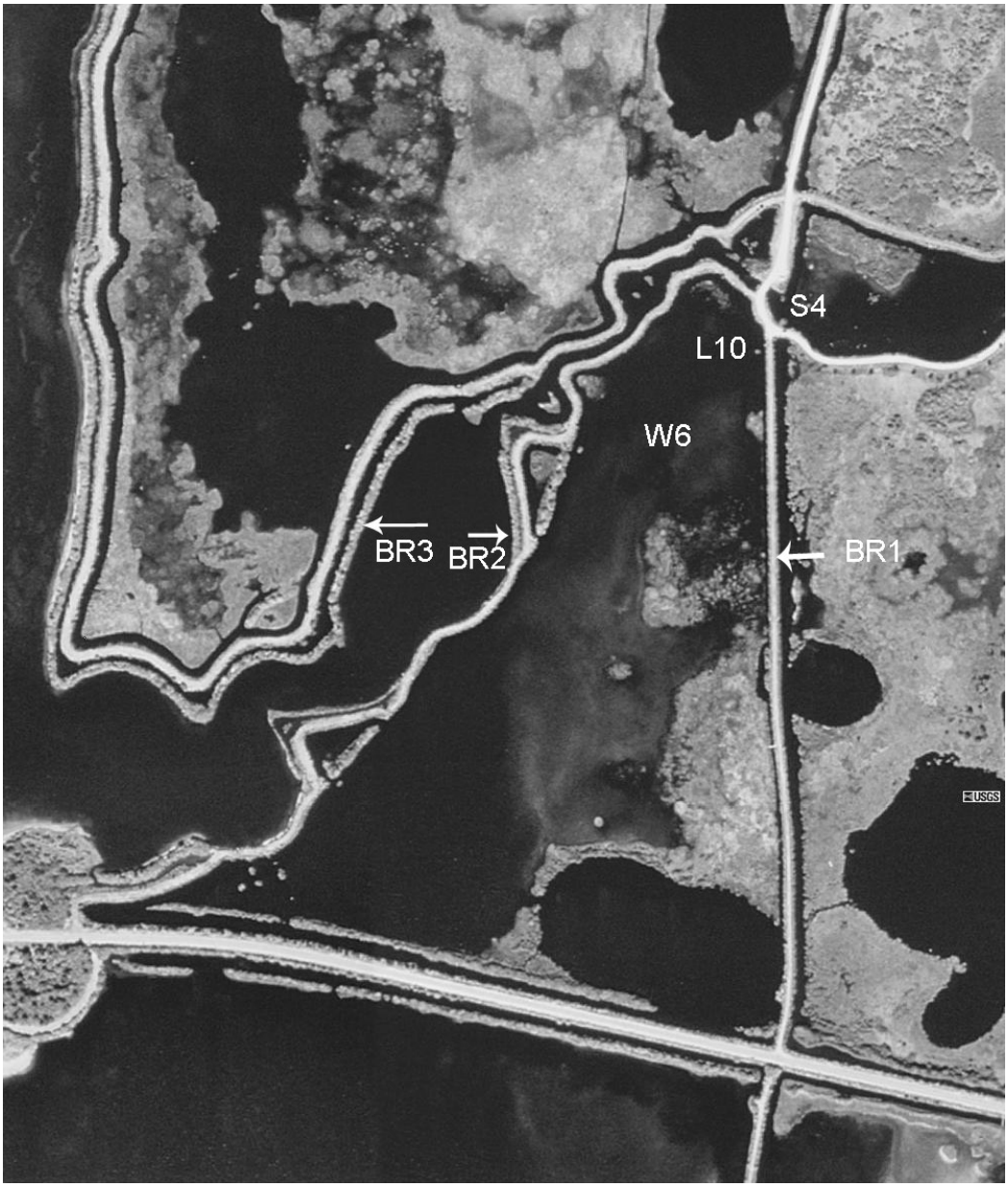
At **L8,** a culvert allows water to drain into **W5**. On an afternoon in late November 2005, large numbers of baitfish and the like were entering **W5** through the culvert. Over the course of Thanksgiving and the subsequent weekend, a group of Forster's Terns swooped above the culvert and dove into the water. The vegetation at the side of the road precluded making images of the dives but as the birds banked and hovered before diving, excellent flight opportunities abounded.

Forster's Tern, 11/27/05
Canon 1D Mark II with Canon 500mm f/4 IS
1/3200 sec, f/6.3, Mode: Manual, Metering: Evaluative, ISO: 400

Besides the terns, up to 150 Roseate Spoonbills flew into **W5** between **L8** and **L9**. This area is **Stop 4** (**S4**) on the drive and the only place on the drive proper that you can get eye level with the birds from the parking lot at **S4**.

Roseate Spoonbill, 11/27/05
Canon 1D Mark II with Canon 500mm f/4 IS with 1.4x TC
1/400 sec, f/8, Mode: Av, Metering: Evaluative, ISO: 400

Roseate Spoonbill, 1/14/07
Canon 1Ds Mark II with Canon 300mm f/2.8 IS with 1.4x TC
1/3200 sec, f/8, Mode: Av, Metering: Evaluative, Exp. Comp. -1, ISO: 400



"Image courtesy of the USGS"

I captured the image of the Killdeer below at **L10** while standing on the berm road **BR1** at sunset. Use flash to open up the shadows. Like the Reddish Egret a few pages back, I chose to place my subject in the center of the frame, generally a big no-no.

Note the ripples undulating out from the Killdeer's legs each time he moved ever so slightly. The ripples are the compositional element that makes the centered subject work. Here I cropped tighter and made a panoramic for a more dramatic effect eliminating much of the negative space from the original capture.

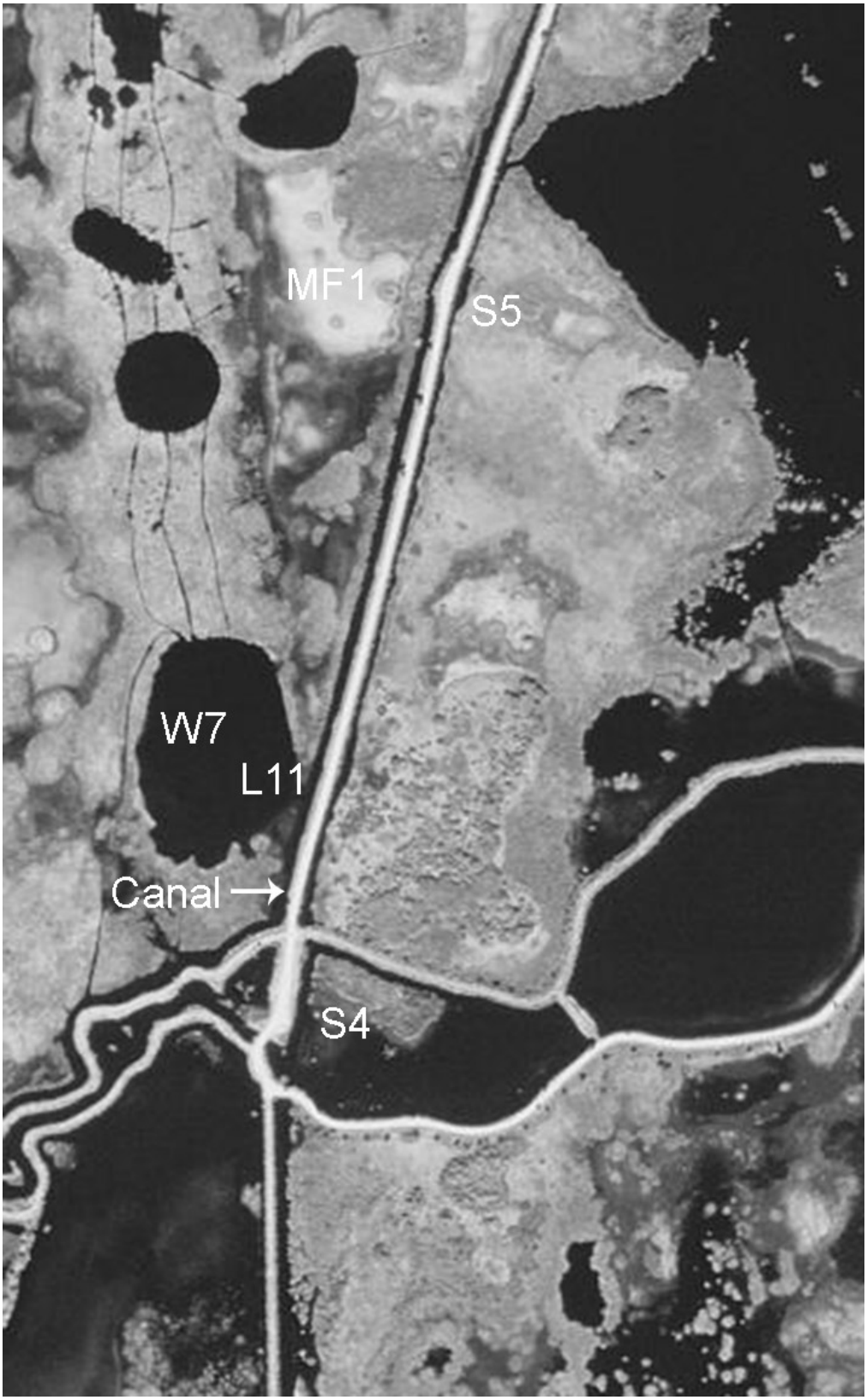
You can walk out on the Berm Roads (**BR1**, **BR2** and **BR3**) for better views of W6. Depending upon water levels, this area may have shorebirds, gulls and terns. Black

Skimmers are common during the winter and you may see terns fishing the water bounded by the berm roads. If you venture out here watch for Snipe and Rails along the banks of the berms as they like the mangrove cover here.

Killdeer, 1/1/05
Canon 1D Mark II with Canon 500mm f/4 IS and 2x TC
1/400 sec, f/8, Mode: Av, Metering: Evaluative, Exp comp: +2/3
ISO: 1250, Flash exp comp: +1 2/3

I captured this stunning Common Snipe with reflection while walking along **BR2**. Looking north along the bank of **BR3** is where I spotted him.

Common Snipe, 12/24/05
Canon 1D Mark II with Canon 500mm f/4 IS and 2x TC
1/200 sec, f/8
Mode: Av
Metering: Evaluative
Exp comp: -2/3
ISO: 800
Flash exp comp: -1/3



"Image courtesy of the USGS"

Female Boat-tailed Grackle, 1/22/06
Canon 1D Mark II n
Canon 500mm f/4 IS w/1.4x TC
1/640 sec, f/9
Mode: Manual
Metering: Evaluative
ISO: 500
Manual Flash

As you proceed along the drive, do not overlook the vegetation along the sides of the road as you scope out the impoundments for opportunities. Perched Grackles and Blackbirds as well as other year-round and migrant song and perching bird species frequent these locations. However, your best bet at getting these photographs is to shoot from your vehicle, roll up slowly on your subject then compose and shoot quickly. Some opportunities are fleeting. I prefer to make an image, then if the subject remains work more carefully. In this image, I used flash to open up the shadows. I created this image along the drive on the right side of the road approaching **S5** in late afternoon light. See the Shooting Techniques Guide for details on shooting from your vehicle.

Wood Storks, 1/15/06
Canon 1D Mark II n with 500mm f/4 IS
1/250 sec, f/22
Mode: Manual
Metering: Evaluative
ISO: 1600
Manual Flash

On one fantastic afternoon in January of 2006 I was conducting a private workshop for a couple when we came to Location **L11** in **W7**. Many times, I pass this body of water and nothing is going on at it. Other times the **canal** along the left side as you approach **W7** has Lesser Yellowlegs and other shorebirds feeding along it. In the morning that day we had White Pelicans landing in the deeper sections of the impoundment **W7** towards the back yielding some nice flight shooting in good light; but on this afternoon a group of Wood Storks were feeding close to the road at **L11**. Though we were facing east into the setting sun, this was a great time to teach my participants "flash-as-main-light" (see the "Techniques" section for details).

My criticism of the image above is that I should have included the full reflection of the storks. Though I intended to do this, I first made some images with the 500mm and flash to demonstrate the technique to my workshop participants. Moving to help them set-up for similar images, I suggested they frame for the full reflection. By the time I returned to my camera, the storks had moved to a position where a full reflection was possible with my 500mm lens. Recomposing, I captured the image at right with the full reflection.

Wood Storks, 1/15/06
Canon 1D Mark II n with 500mm f/4
IS 1/60 sec, f/20
Mode: Manual
Metering: Evaluative
ISO: 1000, Manual Flash

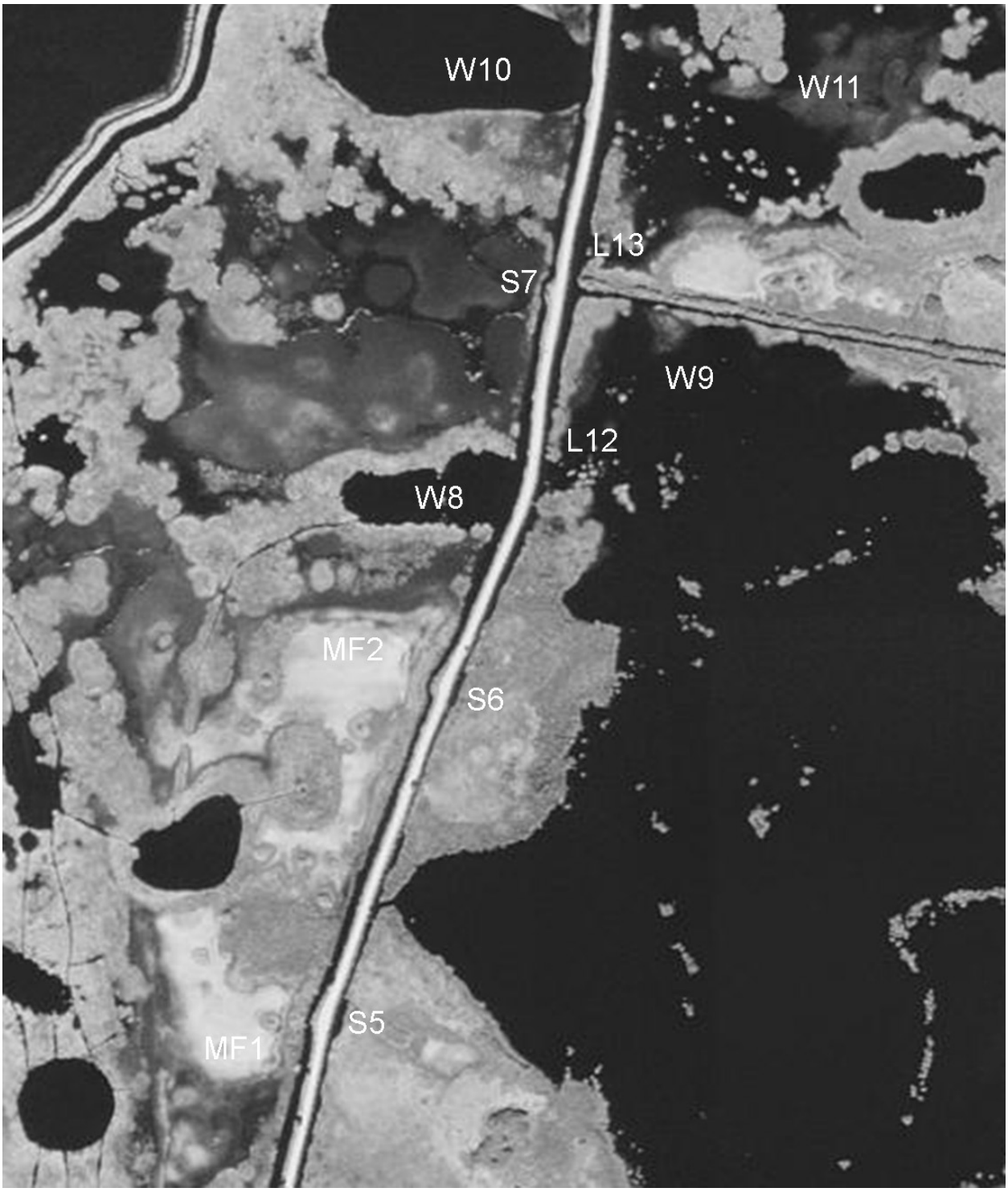
Note the great depth-of-field. I needed to use a high ISO as the small aperture necessitated the use of a slow shutter speed. The flash yields sharp images even at slow shutter speeds.

As we waited for the sun to set the colors on the water intensified to a degree that I had never experienced before at MINWR. Again using "flash-as-main-light" to illuminate the storks, I set the ambient exposure to capture the background colors and captured the super-saturated image the follows.

Some people that I have shown these images to do not like the obvious use of flash; others think they are unique and different. I think they are cool and demonstrate what you can accomplish with digital. I did not capture these images with the correct

exposure on the first try; some testing was required and using the histogram to judge the exposure was of great value. ***LESSON – USE THE HISTOGRAM!***

Wood Storks, 1/15/06
Canon 1D Mark II n with 500mm f/4 and 1.4xTC
IS 1/80 sec, f/6.3, Mode: Manual, Metering: Evaluative, ISO: 1000, Manual Flash



"Image courtesy of the USGS"

Great Egret, 1/15/06
Canon 1D Mark II n
Canon 500mm f/4 IS w/2x TC
1/2000 sec, f/8
Mode: Manual
Metering: Evaluative
ISO: 400

Possibilities include environmental images like this of a Great Egret created near **S5**.

I photographed the Northern Pintails below as the flock moved from impoundments at **W11** to **W9** at location **L12**. This is best in the afternoon when the sun is at your back.

Capture data is not shown but the images were made 1/22/06 using a Canon 1D Mark II n, Canon 500mm f/4 IS and either 1.4x or 2x Canon teleconverters.

Many photographs at MINWR necessitate the use of long lenses with and without teleconverters.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The spoonbill image that follow were also captured at Location **L12** using the same equipment as I used for the Pintails above.

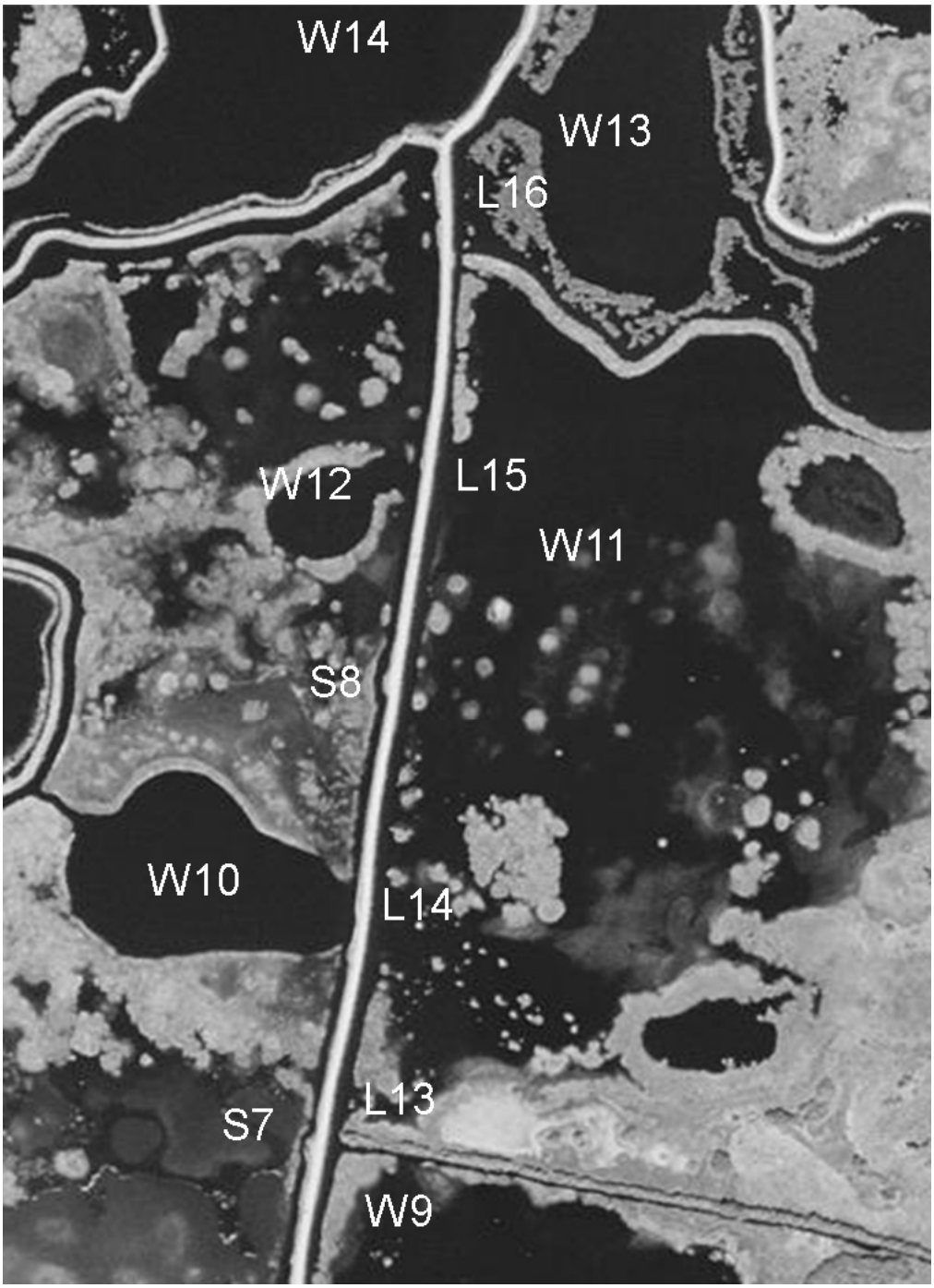
The Kennedy Space Center (KSC) Police helicopter makes a pass over MINWR on the Drive flushing waders, ducks, Spoonbills. Since “911”, over flights in both MINWR and the Seashore are common as part of increased security at Cape Canaveral.

Vultures, like the Turkey Vultures pictured below like to lounge on the mudflats (MF1 and MF2) when they are dry. Shorebirds, terns and gulls galore may be present when the mudflats are wet. Longer lens and teleconverters will be needed for these distant subjects. Do not overlook long images that isolate flocks as well as the environment.

Canon 1D Mark II n with Canon 500mm f/4 IS w/2x TC
1/640 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

I made the wide image below because I liked the black vulture against the black mud. The red head sets him off nicely.

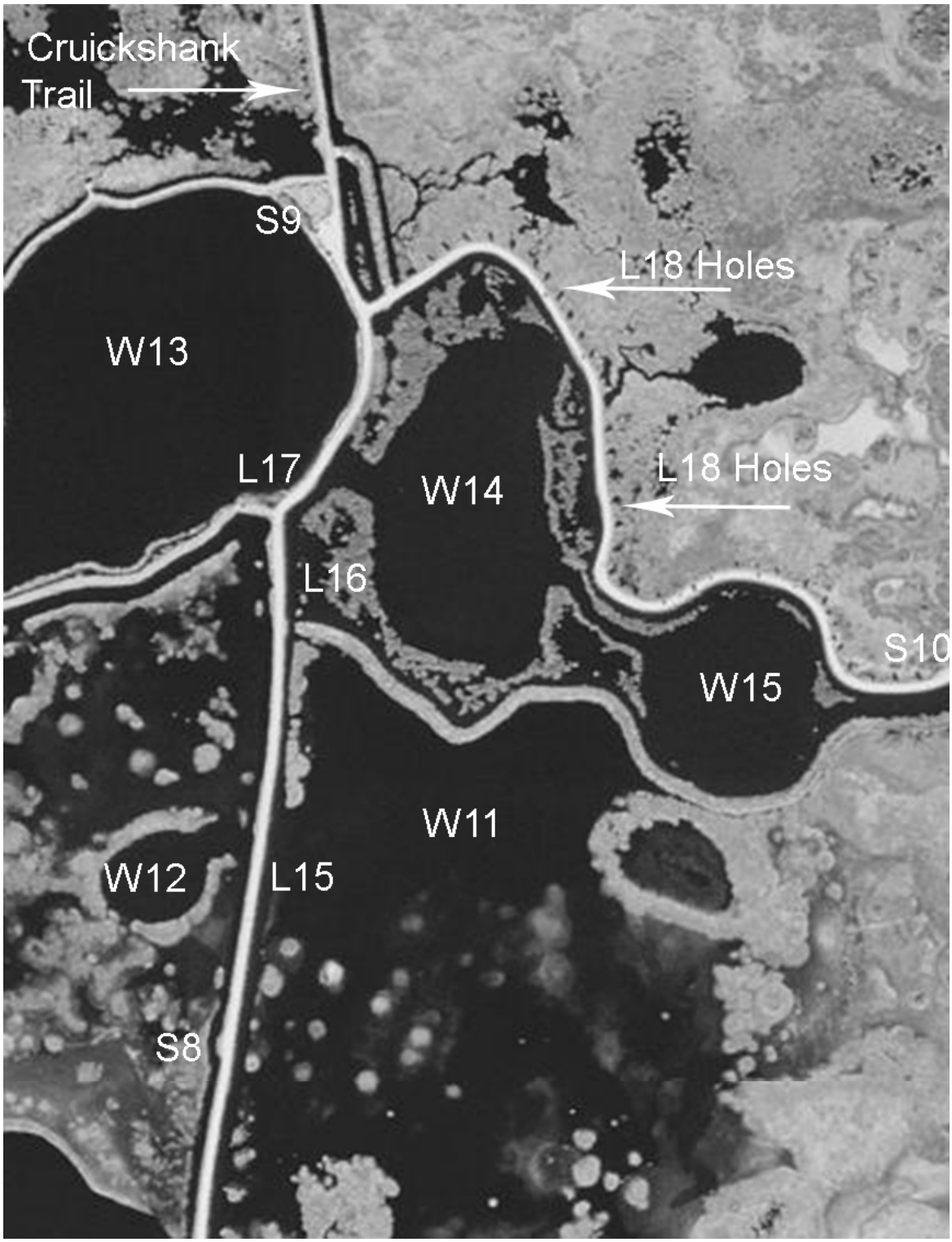
Canon 1D Mark II n with Canon 500mm f/4 IS w/2x TC
1/640 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400



"Image courtesy of the USGS"

I captured the Hooded Merganser in flight on the following page at **W10**, which is a large, relatively deep (6" to 12") body of water that diving ducks like the Hooded Merganser frequent. On this particular day, a large group of males and females were showing and performing elaborate mating rituals. I was photographing the males putting the crest up and thrusting forwards their chest when I notice this male blast from the water. I quickly acquired the Merganser and fired off five in-focus flight images, this one being my favorite.

Hooded Merganser in Flight, 12/24/05
Canon 1D Mark II n with Canon 500mm f/4 IS w/2x TC
1/1000 sec, f/10, Mode: Manual, Metering: Evaluative, ISO: 400



"Image courtesy of the USGS"

W13 is open to the Indian River Lagoon and is deep so you do not see waders or ducks in it. What you do see are mullet and other large fish that attract alligators, gulls, terns, osprey and Brown Pelicans like those below. At Location **L17** in the morning, you may have the sun at your back and good opportunities for flight and possible splashdowns as the birds swoop in to catch a meal.

Brown Pelican, 1/15/06
Canon 1D Mark II n with 500mm f/4 IS and 2x TC
1/2000 sec, f/8
Mode: Manual
Metering: Evaluative
ISO: 400

This poor Pelican struggled with a large fish for 8 minutes before another pelican snatched it from him when he partly removed it from his mouth to reposition it. I felt bad for him. Here he is trying to swallow it but his pouch, laden with the heavy fish is sagging to one side making that impossible.

Brown Pelican, 1/15/06
Canon 1D Mark II n with 500mm f/4 IS and 2x TC
1/2000 sec, f/8
Mode: Manual
Metering: Evaluative
ISO: 400

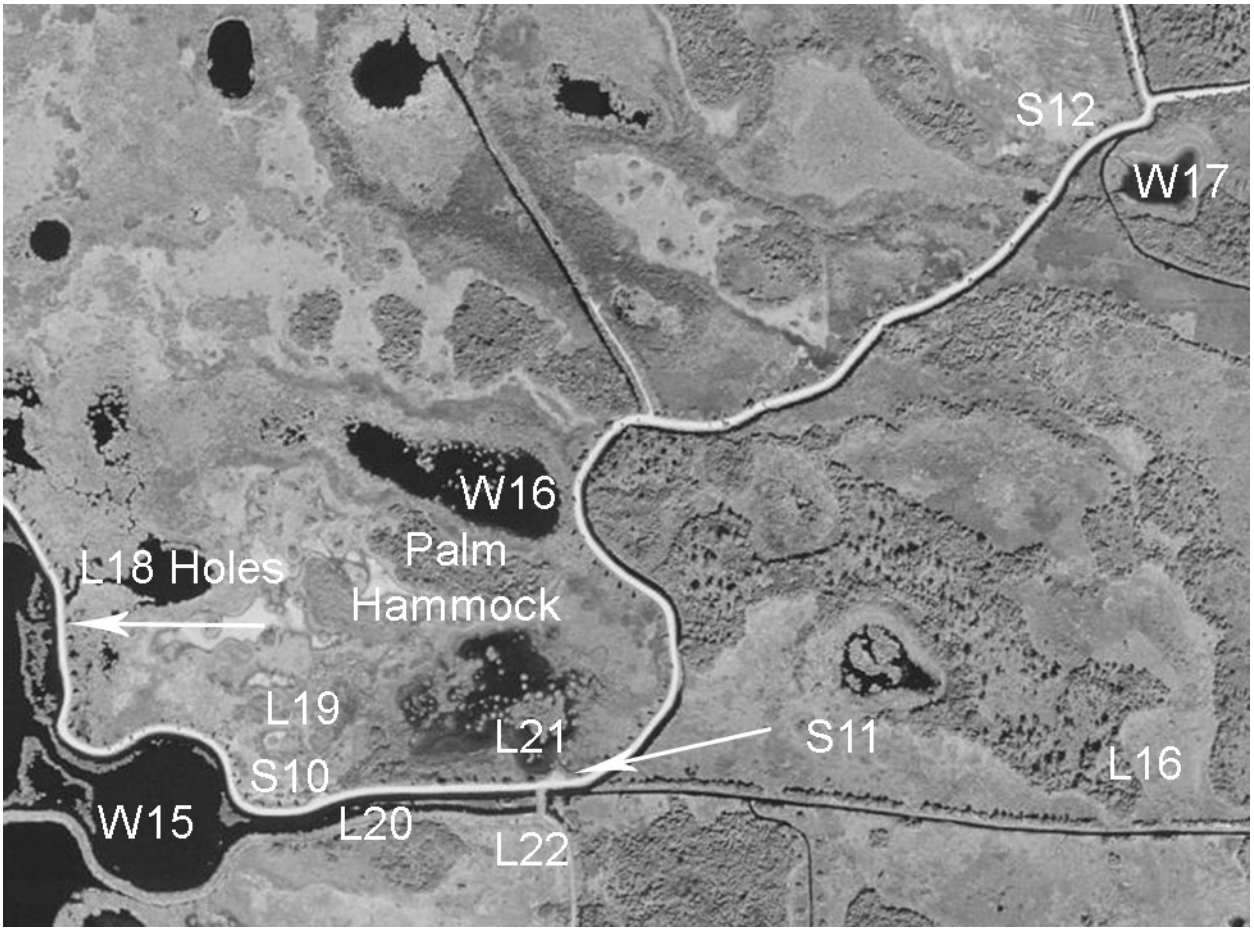
If you see Pelicans like this one or Ospreys, Eagles and the like scoping out **W13** for a meal, set up at **L17** on the drive. This is a morning opportunity, as you will have the sun at your back.

At **S9,** you come to the Cruickshank Trail and by this time on the drive, you will be glad to see the new restrooms installed in December of 2006 in parking lot. A short walk from the parking lot is an overlook. I have had good opportunities with flight from the overlook though the low roof and supports do make it cumbersome to use a long lens on a tripod.

The trail is 5 miles long. I have explored it but have not found the opportunities to be significantly better than at other more accessible areas of the drive. If you do the whole hike, bring food, water and insect spray. In the summer, it is a hot and humid hike and the mosquitoes are ferocious.

At **L16** Roseate Spoonbills, Green Herons and Black-crown Night Herons may be seen roosting. Light is best in the afternoon but if it is overcast or you are not shooting into direct sunlight. Flash may be used. **W14** is a favorite haunt for the American Coots. Look for them as they run along the top of the water with wings flapping. I have captured some explosive blast-offs of the coots in this area.

As you proceed from **S9** to **S10**, note the small water holes on the east side of the drive (**L18 Holes**). In the morning, these may be filled with feeding waders and as they move from one hole to the other, excellent flight opportunities exist. Unfortunately, this seems to be a morning occurrence; light would be best in the afternoon but I have seldom seen the same level of activity in the afternoon as I have in the morning. However, with careful positioning and some luck, you can get some decent sun-angles on the birds.



"Image courtesy of the USGS"

At **S10,** there is habitat on your right that in the past has hosted nesting Black-necked Stilts like the one pictured on the following page. This opportunity is long lens and teleconverters, even stacked teleconverters. You may see Northern Harriers here skimming the vegetation in search of prey and they will sometimes fly-over the road.

As you approach **S10,** you come to a canal with a series of small islands on your right. At **L20** just past **S10** is an island larger than the others and more often than not a gator will be sunning itself on it. Though I have taken images of the gators, I do not find them satisfactory as the grass on the island generally obscures the gator's head/face. For many years one gator seemed to "own" that island. He was so large that when he crawled two thirds onto the island three feet of his tail was still in the water. That was one big Alligator but alas, I have not seen him in over a year.

Though I do not consider this a stellar photographic location, it is fun to see one there more often than not. Keep an eye out and maybe you will have a good opportunity.

At **L21**, which is at **S11**, I have seen Black-necked Stilt and various shorebird species feeding in a shallow marsh. This area is best in the morning. For whatever reason, I frequently see Great Blue Heron and other waders in the canal at **L22** as you leave **S11**

on the right side of the road. Best light is in the afternoon here though the birds may be in shade.

Black-neck Stilt at L19, 6/5/05
Canon 20D with Canon 500mm f/4 IS and 1.4x TC
1/640 sec, f/6.3, Mode: Av, Metering: Evaluative, ISO: 400

Between **S11** and **S12** there is usually not much photograph avian-wise to photograph but there are some nice landscapes. As you approach **W16,** be on the lookout for (a) nothing, or (b) waders and others. Great Egrets, Black-necked Stilts, Great and Lesser Yellowlegs, and assorted ducks frequent **W16**. Some examples follow.

I photographed the sunrise on following page with the specific purpose of capturing birds flying through it. Alas, no birds, those are sunspots you see. This image was made from the drive looking east at sunrise half way between **S11** and **S12**.

Below that is a Dragonfly that is another example of the non-avian subjects at the refuge. Taken on the left side of the drive at **S11** in the morning.

Sunrise through Pine, 4/2/06
Canon 1D Mark II n with 600mm f/4 IS and 2x TC
1/8000 sec, f/9, Mode: Av, Metering: Evaluative, ISO: 400

Dragonfly (species not identified), 6/12/05
Canon 20D with Canon 500mm f/4 IS and 1.4x TC
1/400 sec, f/5.6, Mode: Av, Metering: Evaluative, Exp comp: -2/3, ISO: 800

Palm Hammock, 1/15/06
Canon 20D with 28-135mm @ 38mm
1/400 sec, f/9
Mode: Av
Metering: Evaluative
ISO: 400

In this image, I exposed for the ground and let the moon burn out. In another image, I exposed for the moon. I took the moon from the second image and layered it over the burned out moon in the first image. I would have preferred the hammock to be in full sun but the early morning glow disappeared quickly. In this image, the moon is lacking detail due to low resolution. Below is the same hammock many months later in full sun. Still early (a bit after 8 AM); the long shadows of the slash pines are still on the foreground grasses.

Palm Hammock, 4/2/06, Panoramic Crop
Canon 1D Mark II with 28-135mm @ 53mm
1/400 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

The images on the following page were taken on the right side of the drive about halfway between **S11** and **S12**. Both images are early morning and backlit. I liked the high-contrast look of the backlighting on the Post-Fire Growth and stopped to shoot it, then noticed the bird tracks. Birds are not the only thing to photograph at MINWR.

Bird Tracks in Mud, 4/6/06
Canon 1D Mark II with 28-135mm @ 65mm
1/200 sec, f/14, Mode: Manual, Metering: Evaluative, ISO: 400

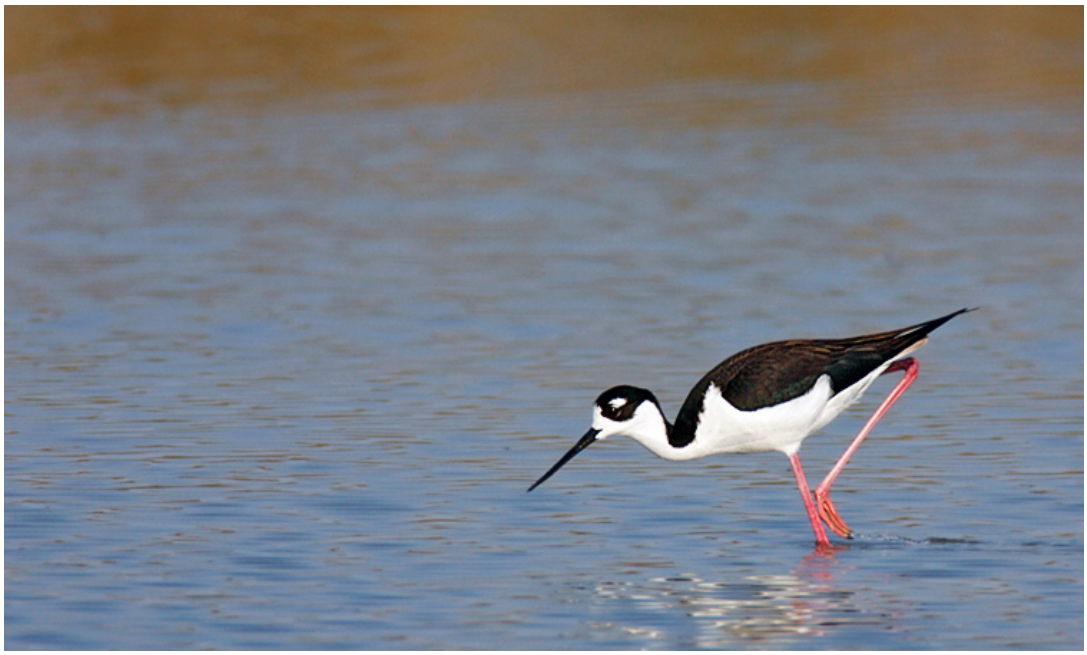
Post-fire Growth, 4/6/06
Canon 1D Mark II with 28-135mm @ 135mm
1/200 sec, f/14, Mode: Manual, Metering: Evaluative, ISO: 400

I used the same manual exposure for both images above. Once I determined the correct backlight exposure, it worked for any scene under similar backlight conditions even though both scenes were very different in tonal value.

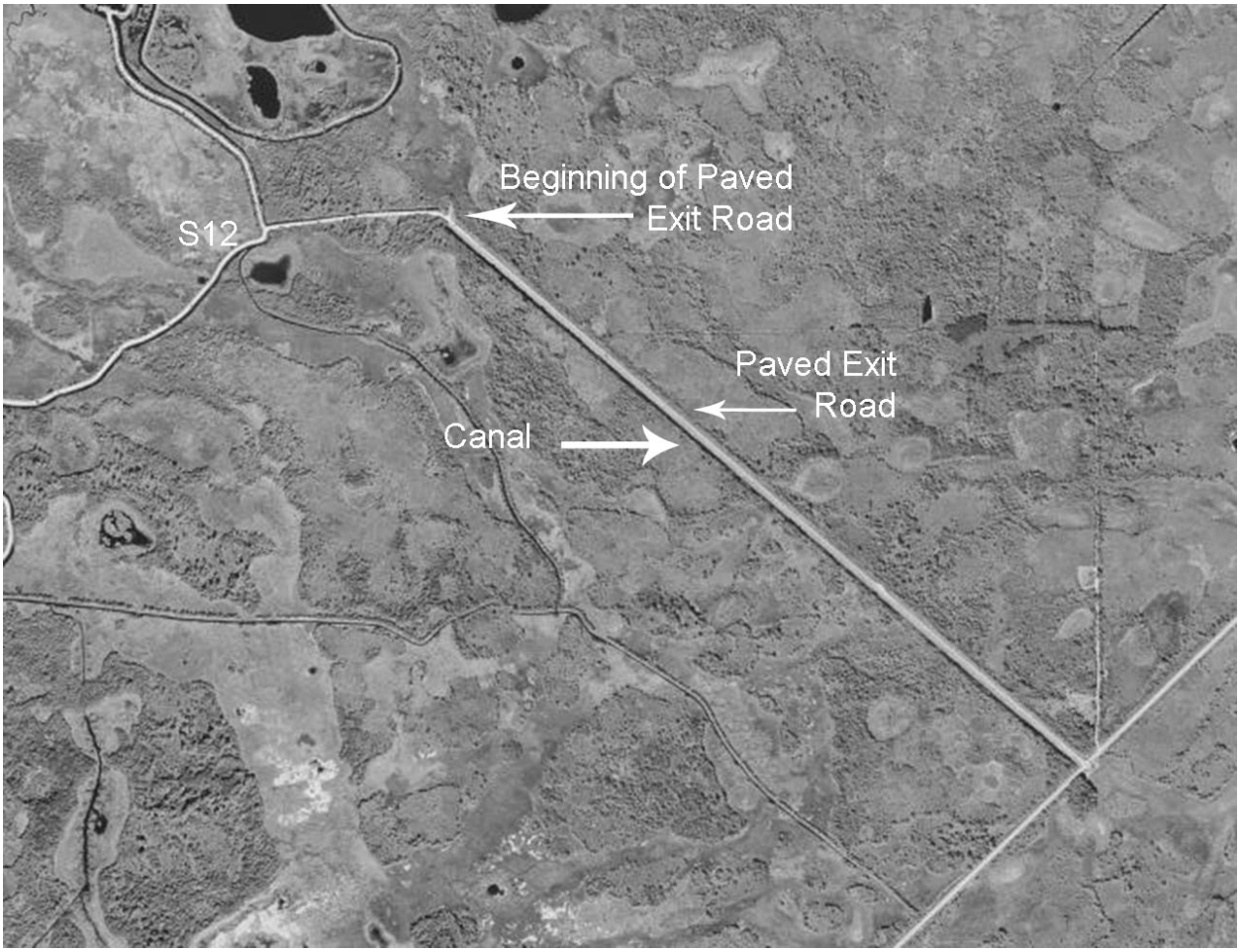
When **W16** is good it can be very good, but at other times there might not be a single bird. A selection of images all captured in the morning follow. This location also offers some nice scenic possibilities. Long lenses and teleconverters are necessary for reasonable close-ups of birds.

Great Egret Preening, 4/2/06
Canon 1D Mark II n with 600mm f/4 IS and 2x TC
1/1000 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

Lesser Yellowlegs Wing Flap, 4/2/06
Canon 1D Mark II n with 600mm f/4 IS and 2x TC
1/2000 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400



Black-neck Stilt, 4/2/06
Canon 1D Mark II n with 600mm f/4 IS and 2x TC
1/1000 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400



"Image courtesy of the USGS"

From **S12** to the exit of Black Point Wildlife Drive, I usually do not find many avian subjects except in April of 2006 when many of the fish in the **canals** along the drive died. I found large groups of waders fishing the **canals** and roosting in the pine trees in the upland areas. Some images from that morning follow. A Bobcat was recently (December of 2006) photographed in the area of **S12** poised in one of the pine trees. I have seen him as well, but in poor light so no images.

Another thing to watch out for at **S12** is a dead Cabbage Palm on the left at the stop. In it are three nesting holes that in the past have housed woodpeckers and recently a snake. During January and February 2007, thousands of Robins were prevalent in the Brazilian Pepper bushes that line the canals between **S11**, **S12** and the beginning of the paved exit road.

The thing to remember is that at any time at MINWR, you can and will find opportunities in areas I have not even discussed. At other times, areas that I have noted will be void of activity.

A word of warning regarding the exit paved road. When I stay the afternoons until sunset, I am generally on this part of the drive in the dark. In the summer and warmer

winter months, LARGE leaping frogs bound out of the canal on the right side of the road and are easily smashed. Alligators also exit this canal after dark and you may find them on the road as well. Please be careful when you leave, especially in the dark.

Great Blue Heron, 4/2/06
Canon 1D Mark II n with 600mm f/4 IS and 2x TC
1/1000 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 640

Great Egret, 4/2/06
Canon 1D Mark II n with 600mm f/4 IS and 2x TC
1/2000 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 320

Great Egret, Ibises and Snowy Egrets in Pine Tree, 4/2/06
Canon 1D Mark II with 28-135mm @ 135mm
1/1600 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

As previously mentioned, in April 2006 at **S12** and beyond, a large group of waders were working the roadside canal for dead fish. On that day, I positioned myself with the sun at my back and did flight photography for about half an hour. The image of the pine tree above depicts only a small number of the waders there that day.

W17 on the left side of the road may have some distant opportunities for environmental birdscapes with long lenses. One time I observed three Great Egrets in an impressive aerial battle just above the pond.

MINWR – Other Areas

Though Black Point Wildlife Drive is the biggest attraction at MINWR, numerous other locations in the refuge are worthy of your attention. They include:

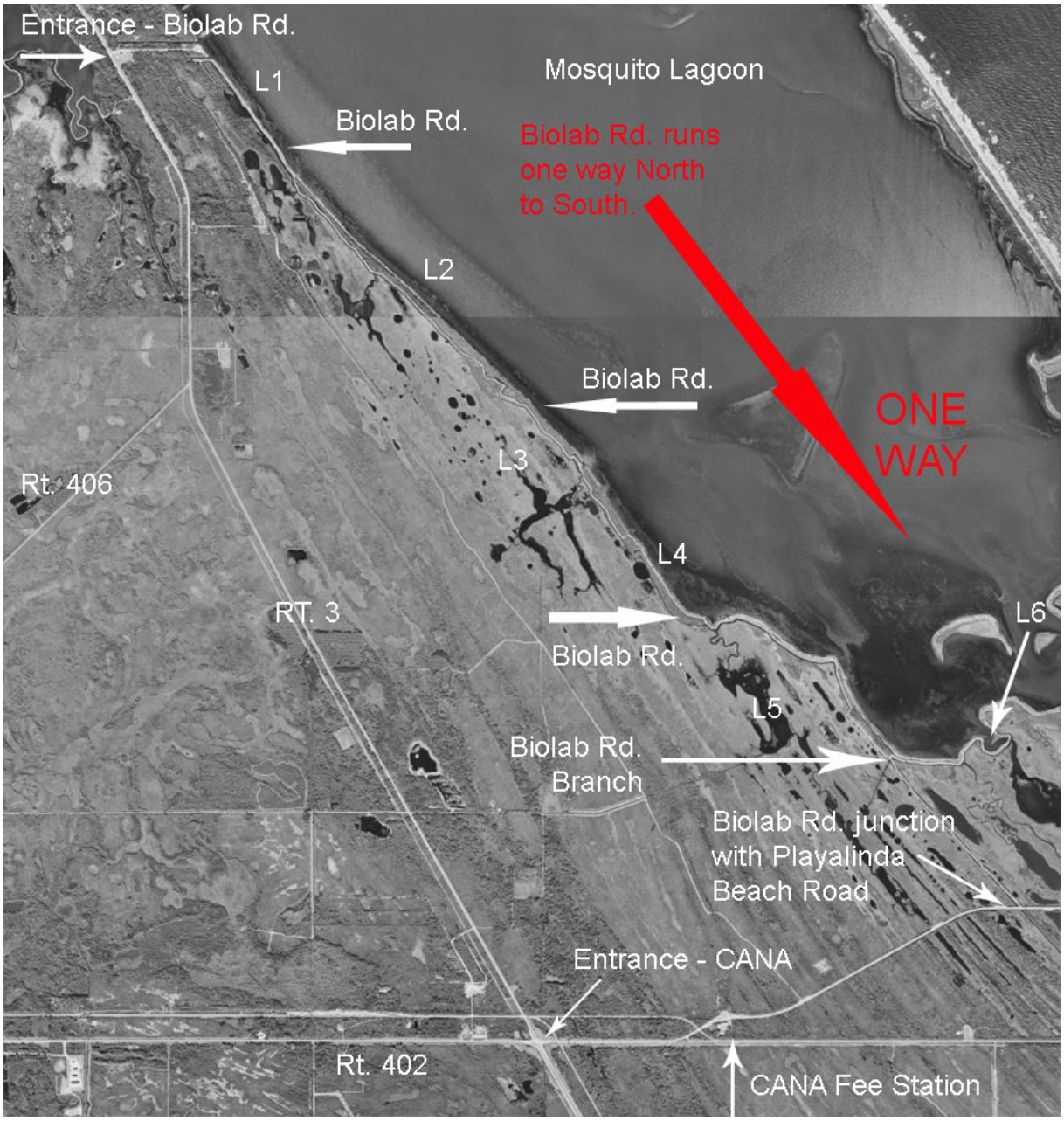
- Biolab Road
- Scrub Ridge Trail – For Scrub Jays primarily.
- Visitor's Center – worth a short stop.
- The following are interconnected and may be combined into a single morning or afternoon of shooting.
    - Peacocks Pocket Road
    - Gator Creek Road
    - East Gator Creek Road
    - West Gator Creek Road
    - Catfish Creek Road
- Shiloh Marsh Road
    - Shiloh 5
    - Shiloh 3
    - Shiloh 1 - North
    - Shiloh 1 - South
- Cruickshank Trail
- L Pond Road
- Pump House Road
- Eddy Creek and Dummit Cove Canoe/Kayak Launch

The USFWS aerial view maps are used in the following descriptions. See reference: Maps of the drives and trails in the Merritt Island National Wildlife Refuge, Steve Davidson, 11/16/06: http://www.fws.gov/merrittisland/Maps-DrivesTrails/.

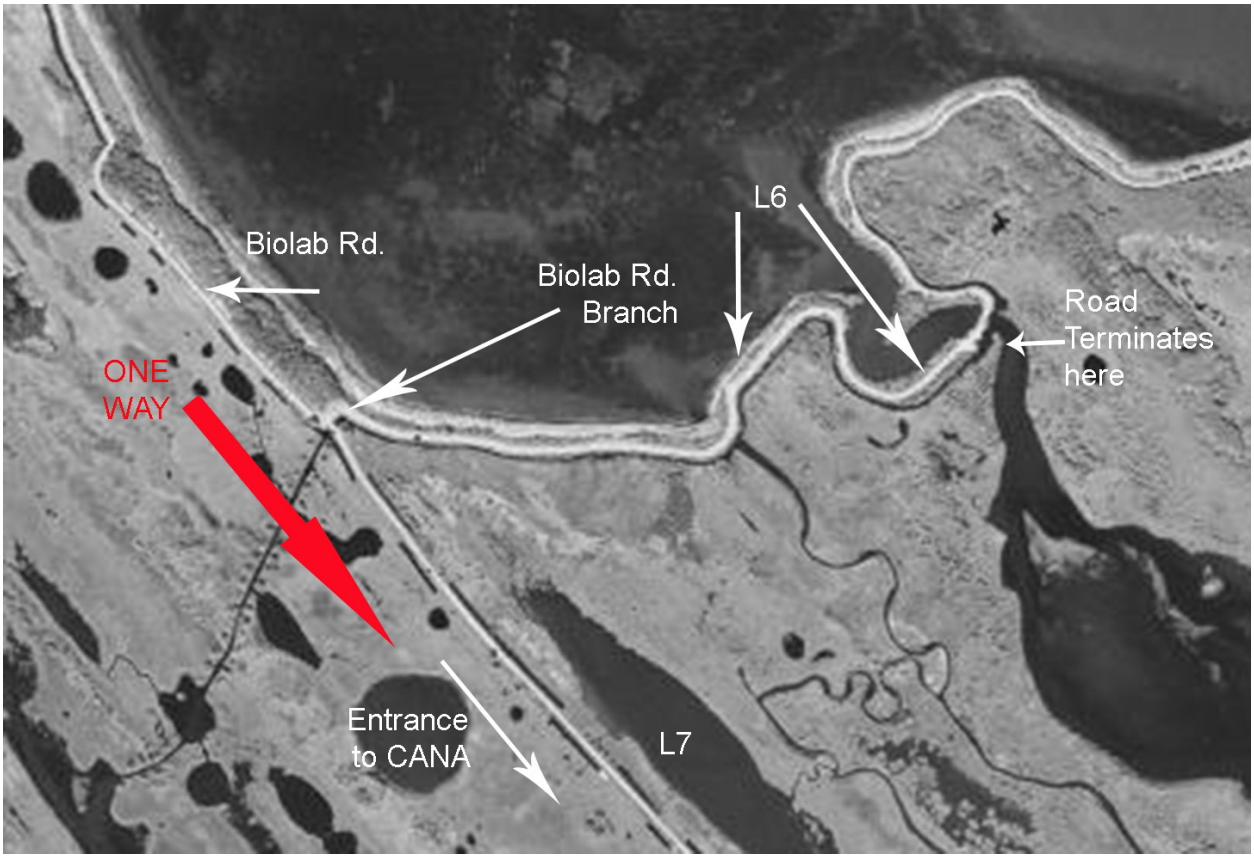
I have endeavored to mark those locations I have found productive in the past and to include images from these locations in future releases.

At one time Biolab Road was two way but was changed to one-way (running north to south) in 2006. The Northern entrance is off SR 3, North of SR 402 and 406 and terminates at the entrance road to the Playalinda Beach section of the Canaveral National Seashore. Persons entering the seashore from Biolab Road should return the short distance west to the fee booth to pay the admission. If entering the seashore please pay the fee. Our National Parks and Wildlife Refuges are on a tight budget.

Many scenic landscape images are possible here and Ospreys hunt and roost here. Numerous Black and Turkey Vulture are also present. Various portions of the road front Mosquito Lagoon allowing access to waders and shorebirds. The canals along the road host alligators and the marshes wading birds.



"Image courtesy of the USGS"

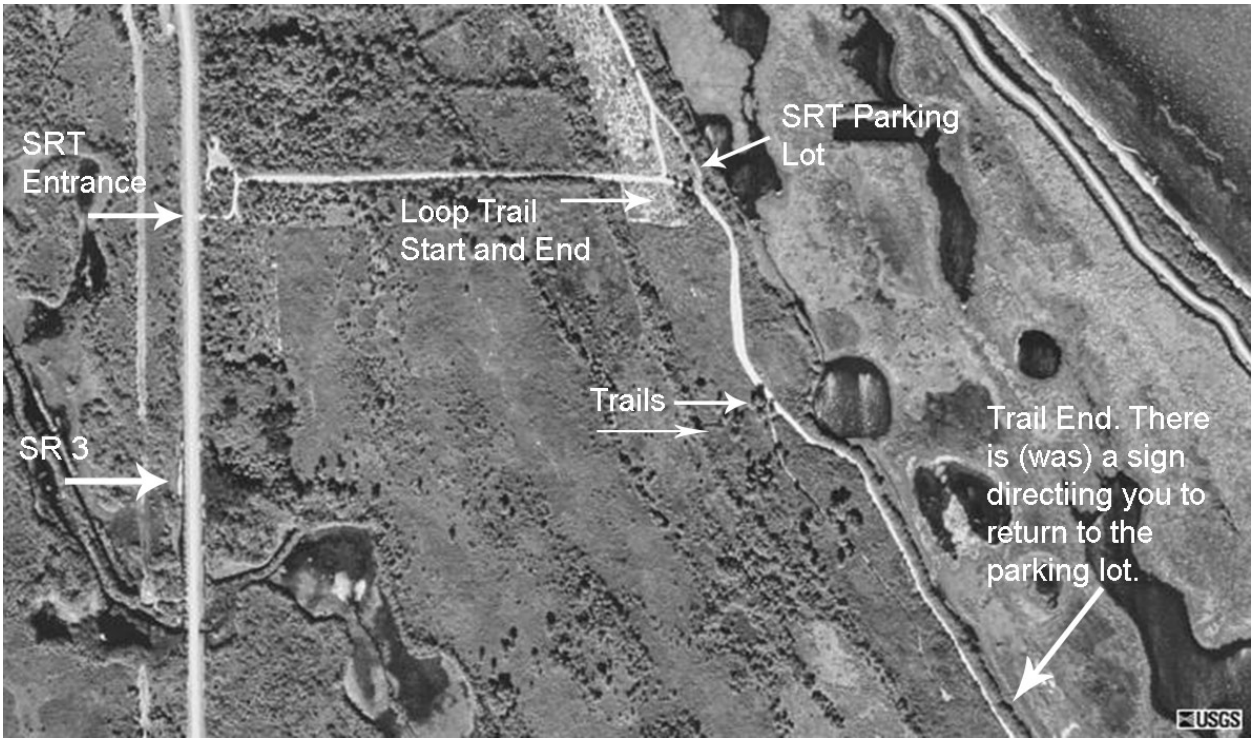


"Image courtesy of the USGS"

Dead snags along the Biolab Road branch road (my name) at **L6** are good places for perched Osprey and Vultures in morning light. It is a favorite of mine and flight photography of the birds landing and taking off here are possible here. I have found that the perched birds may tolerate approaches on foot but you may want to get some photographs from the vehicle before venturing out.

Scrub Ridge Trail is one of my favorite places in the refuge because I love Scrub Jays, a Florida endemic species that is threatened. They are quite approachable.

The Scrub Jays may also be found along the Canaveral National Seashore access road around the fee station when you enter as well as at the offices adjacent to the fee station. See the Canaveral National Seashore Site Guide for more details.



"Image courtesy of the USGS"

Visitor's Center

The Visitor's Center for MINWR is located off SR 402. Besides the usual interpretative displays, brochures, maps and gift shop, the center has a boardwalk/nature trail, an Osprey nesting platform that is regularly used, and two ponds that attract various birds. They also have a butterfly garden.

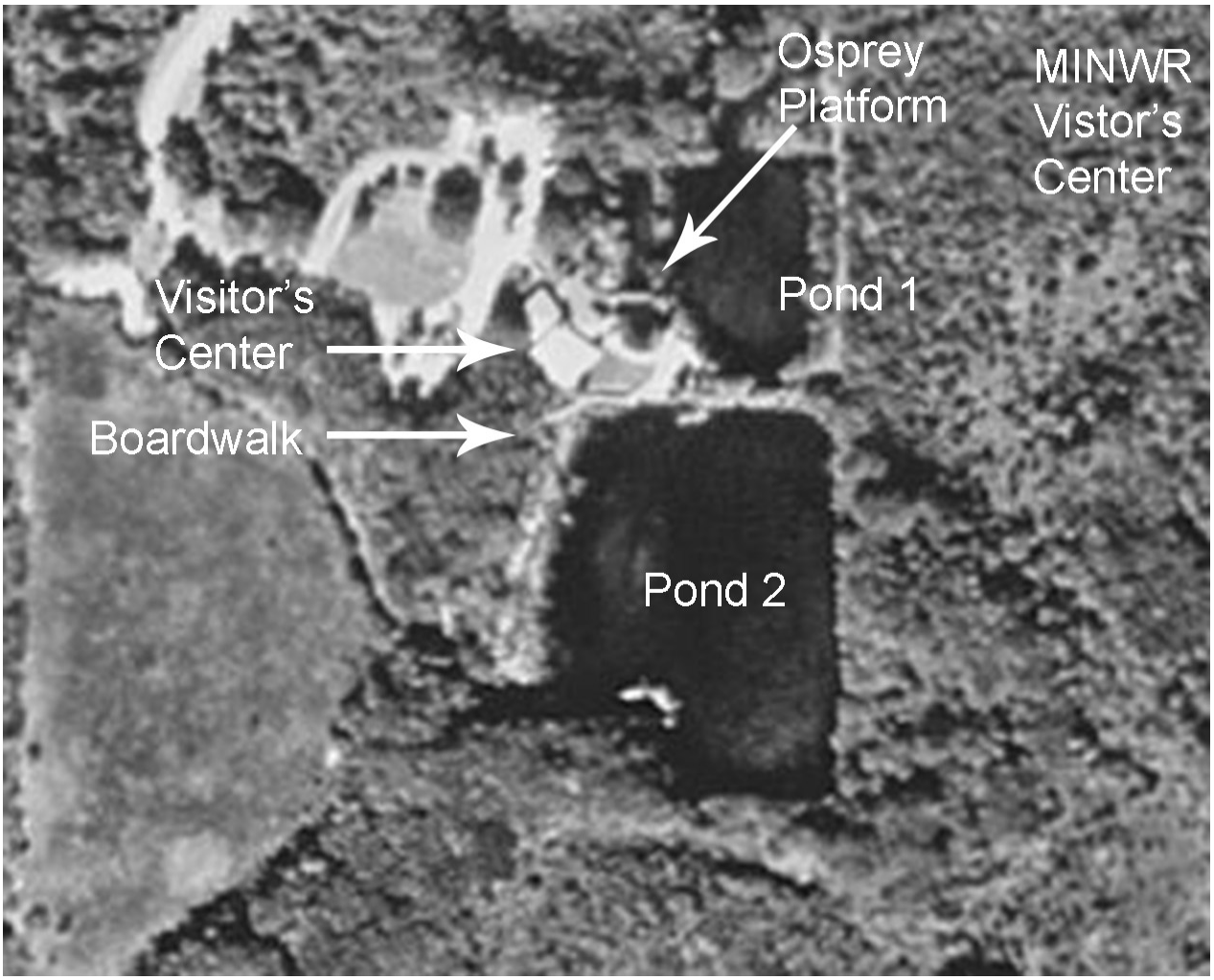
Possibilities exist here no farther than the parking lot where I once photographed a Yellow Argiope Spider. Butterflies are possible at the butterfly garden when in bloom. During nesting season, the Osprey platform may have a nesting pair. Do not forget to scope out the ponds for ducks and waders.

Interesting nature studies are possible on the boardwalk, which will bring you through a mix of oak, pine and palmetto forest. Here I use my 180mm macro lens and 1Ds Mark II on a monopod. I then go for up-close, shallow depth of field images. By using the monopod, I can move back and forth into the scene, changing the plane of focus and yielding a changing array of compositions. The monopod also cuts down on fatigue since you do not have to hold the camera up. The map below shows the overall location of the Visitor's center off SR 402.

"Image courtesy of the USGS"

This map shows a closer view with the primary attractions noted.

At the very least, it is a convenient restroom stop ☺



"Image courtesy of the USGS"

Catfish, Gator Creek Road & Peacocks Pocket Road

Gator Creek, East Gator Creek, West Gator Creek and Catfish Creek Roads

Gator Creek Road off of SR 406 (marked with a street sign), provides access to Catfish Creek, East and West Gator Creek and Peacocks Pocket Roads.

Catfish Creek and West Gator Creek Road will bring you around impoundments that may have waders, shorebirds, White Pelican and Osprey fishing. Views exist on either side of the road and opportunities may be found in morning or afternoon. Remember that your best light on the subject occurs with the sun directly or almost directly behind you.

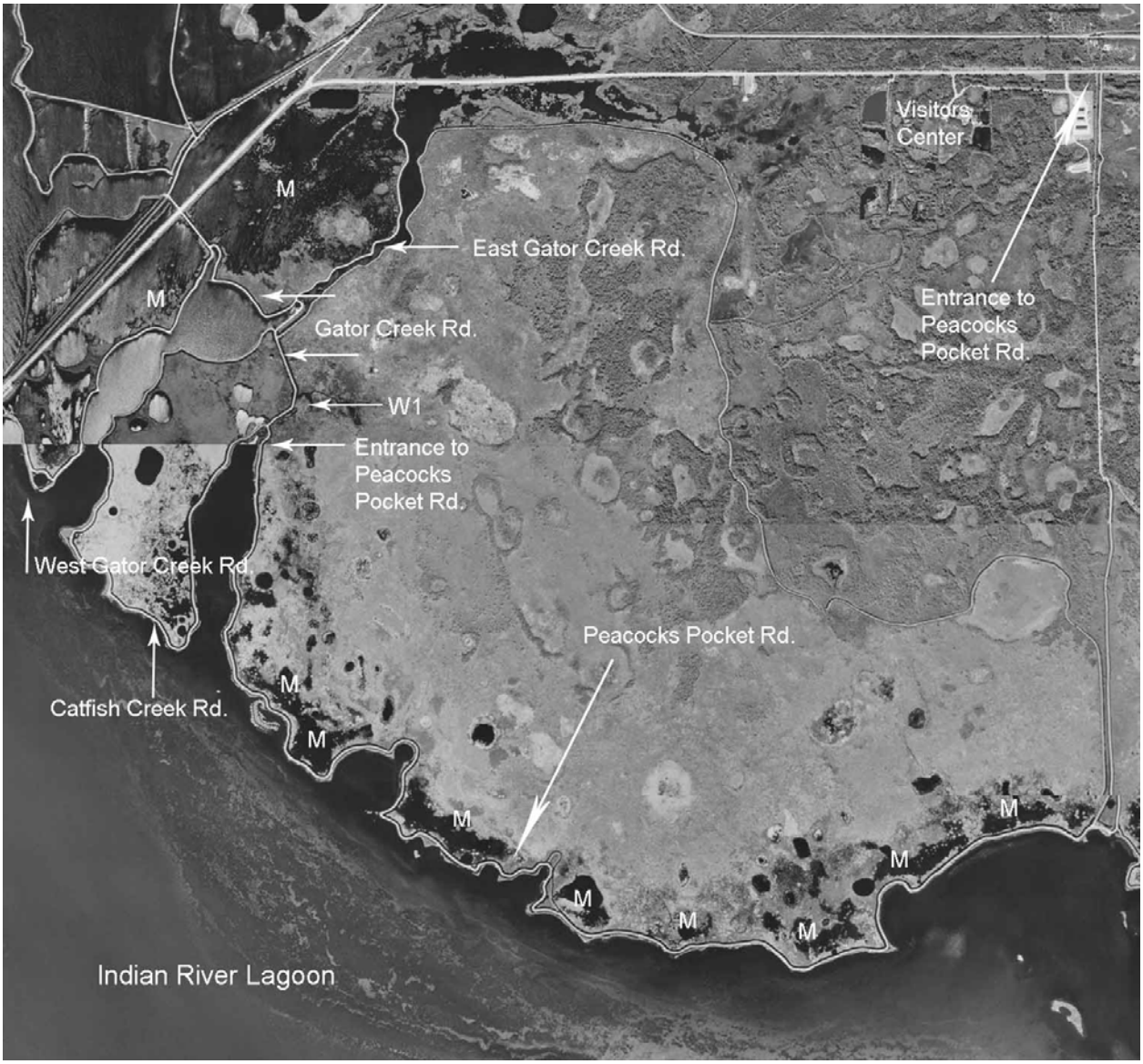
Gator Creek Road provides AM or PM light on either side of it. East Gator Creek Road is a rough drive and I have not found much of interest there during my visits. Catfish Creek Road was a rough drive as well the last time I was there (fall 2006).

A body of water at **W1** can be a good afternoon shooting location for birds in flight and landing in the impoundment.

Peacocks Pocket Road is reached on its eastern access on SR 402 a few 100 yards after the Visitor Center entrance heading east and on its western access from Gator Creek Road off SR 406. Gator Creek Road is marked with a sign.

In morning, enter at the SR 402 entrance along a relatively long dirt approach road that brings you to the Indian River Lagoon on the left and refuge impoundments on the right. If you are photographing in the afternoon, enter at the Gator Creek Road (look for street sign on SR 406).

My strategy is to enter so that the sun is on the passenger side of the vehicle. If you have someone with you to drive, you can place yourself in the best seat in the vehicle to allow photographing from the windows. On many occasions, I have come across birds that tolerated a close approach in the car but not on foot. I first make my images from the car and then attempt an approach on foot. Generally, the ducks are most easily flushed though waders may be intolerant of a close approach if no physical barrier exists between you and them (such as a canal).

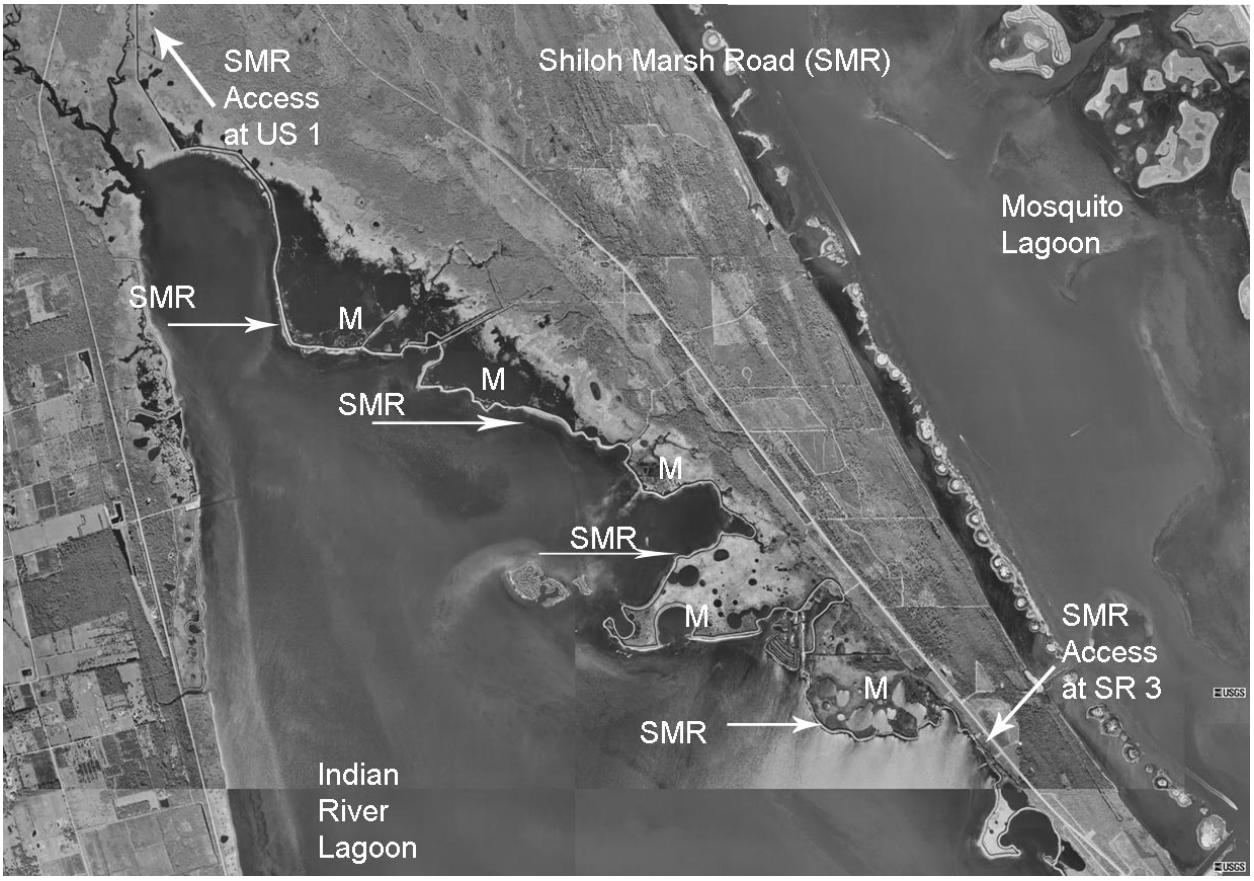


"Image courtesy of the USGS"

Shiloh Marsh Road (SMR) is closed November through February each year during the waterfowl migration. You can walk or bike out onto those areas shown below but it can be quite a trek to get to the marshes on the east side of the road and Indian River Lagoon on the west side. Mornings or afternoons can be good on SMR. Unfortunately, over the past few years, it has been closed first for reconditioning, then due to hurricanes in 2004 and 2005 and then or the yearly planned closures mentioned above. These closures have kept me from getting out there on a regular basis. In the maps below from http://www.fws.gov/merrittisland/Maps-DrivesTrails/, you will note the multiple access points. The road is divided up into units (see Appendix 1) with maps for each.

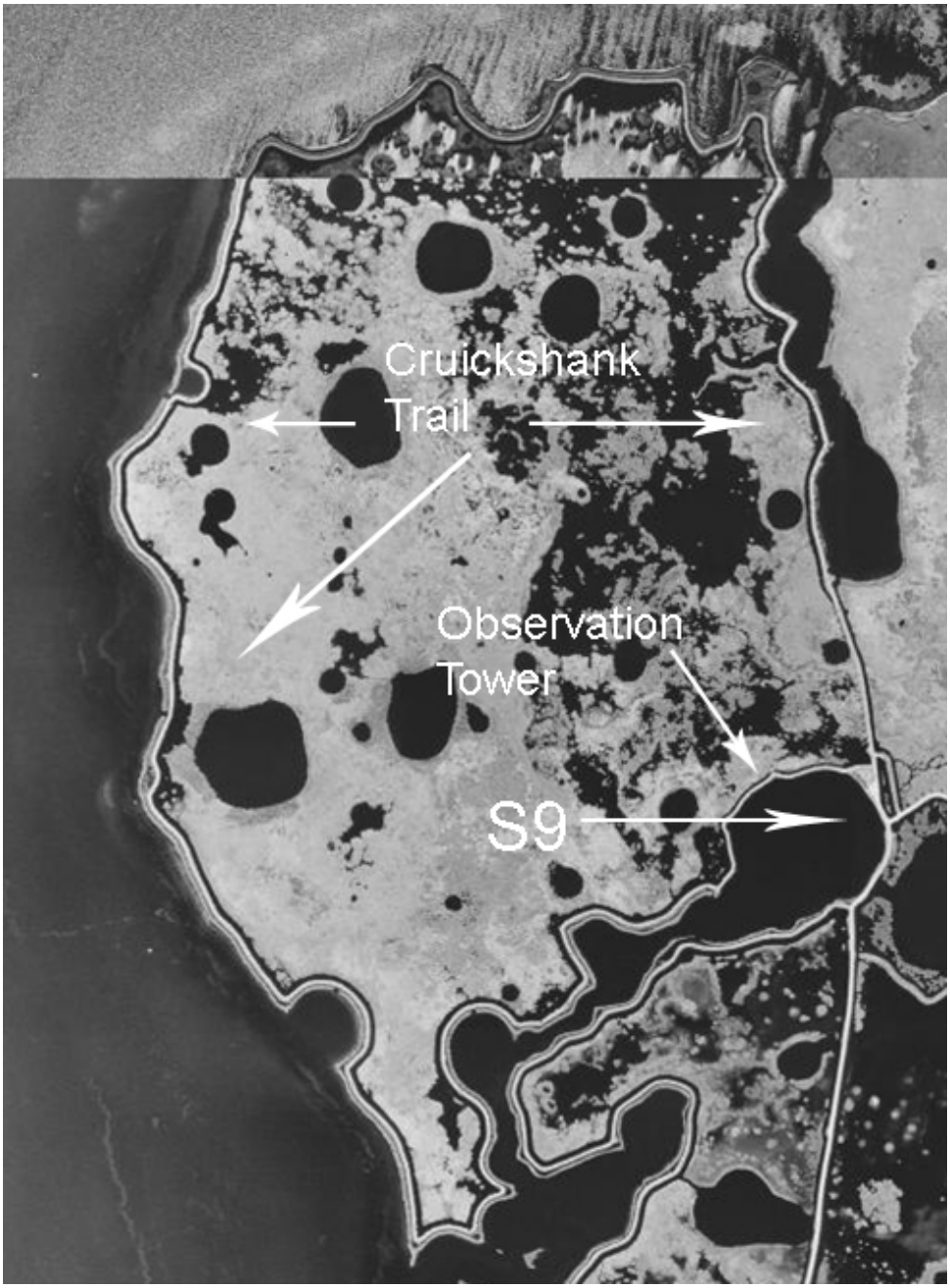
- Shiloh 5, two access points, one on US 1 and the other on SR3
- Shiloh 3, two access points, both on SR3
- Shiloh 1 - North, two access points, both on SR3
- Shiloh 1 - South, two access points, both on SR3

I do not have any specific location recommendations. If you are interested in investigating SMR, I do suggest that afternoons are best as you can photograph the marshes on the east side of the road with the better light of the afternoon at your back. In the mornings, the better light will be on Indian River Lagoon. However, with the various twists and turns on the road, lighting direction will change making shooting in either AM or PM on either side of the road possible.



"Image courtesy of the USGS"

Cruickshank Trail is a 5-mile walking trail starting at **Stop 9** on the Black Point Wildlife Drive that circles a shallow marsh offering possible opportunities from the hiking trail, marsh observation tower near the beginning of the trail or a photo blind. As I mentioned in the Black Point Wildlife Drive section of the guide, I have not explored the trail extensively. I have walked parts of it in either direction at the start at Stop 9 (**S9**). The observation tower and photo blind are close to the parking lot but I have never used the blind. I have flight photographed from the observation tower when the waders were fishing in the water holes near it. As you approach **S9**, look over at the tower and if the birds are close by in the marsh and flying from one water hole to the other, flight possibilities exist and a trip to the tower may be in order.



If you go on the trail for the full loop or a good portion of it, bring water, food and insect repellent and dress accordingly. A good pair of hiking boats is best. The aerial map at right shows you the trail's route around the marsh. The Indian River Lagoon lies to the west.

"Image courtesy of the USGS"

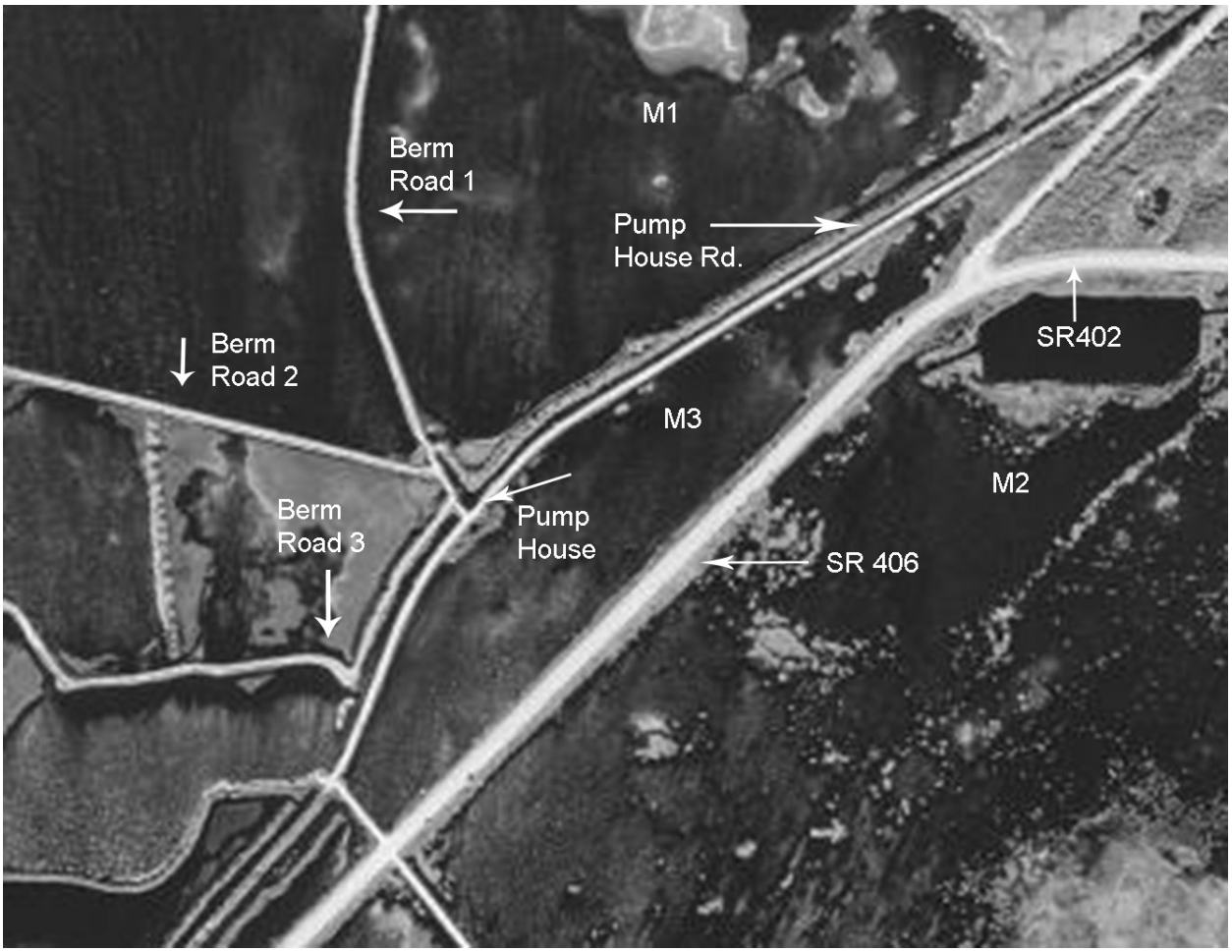
L Pond Road is accessed from Black Point Wildlife Drive where a road sign on the left just before you come to the paved exit directs you to it or from SR3. For whatever reason, I have never been very successful in getting images along L Pond Road and for a number of years, reconditioning and hurricane damage along with November to February planned closures (like Shiloh Marsh Road) have limited access.

It also seems to be a big favorite with anglers. Their presence seems to keep the birds away or confined to areas not favorable to photographers. Cars parked off the road limit drivability and it seems that as soon as you stop, someone comes zipping up behind you impatient to get by. In addition, folks often drive too fast. Overall, it does not make for an enjoyable experience so I prefer to limit my visits to other, more productive areas of the refuge.

If you do go, morning light will be best on the Indian River Lagoon west of the road and afternoon light will be best on the marshes on the east side of the road.

Pump House Road is very popular with birders and the birding lists frequently talk of the large flocks of ducks, White Pelicans and waders seen in **M1** from Berm Road 1. In my trips out there, most of the birds are just too far off.

The canal that runs along the left side of the road (looking east) may be worth a look for Snipe, Rails or similar species. I recently photographed a Great Egret as he took flight after eating a huge fish at the canal. In general, I have not found the area to be productive for photographers. However, as you transverse the refuge on SR 406 or SR 402, look at the marshes on either side of you. The selection of birds can be quite stunning. In the map below, views from SR 406, looking off towards **M2** can offer some great sunrise images as the sun illuminates up the shallow waters of the marsh at sunrise and there have been times when pulling off SR 406 has yielded some nice images of flocks of White Pelicans, Coots or ducks feeding in the marshes.



"Image courtesy of the USGS"

M3 can be quite good for ducks. If you exit Black Point and head down towards SR 402/406 junction, look to the left as you approach the junction and you can see the northeastern end of **M3**. Pulling off the road here can give you access to M3 in this area.

Also, look for Ospreys on the tops of the phone poles eating fish or roosting and Belted Kingfishers on the wires intently watching the marshes for prey. Not the best photo unless you get a flight image of a landing or takeoff, but still interesting to see them.

Eddy Creek and Dummit Cove Canoe/Kayak Launch

If you are a canoer or kayaker, Eddy Creek (inside Canaveral National Seashore) and Dummit Cove (off SR3 near L Pond Road in MINWR) may be of interest to you.

I do not canoe or kayak, so have spent little time in these locations. I have ventured by both when I have been in the vicinity but they have produced no avian photographic opportunities.

On the other hand, if you have something to launch here, this may be a great place to get out on the water.

A BIRDS AS ART - Wildscape Images
Photographer's Site Guide

Merritt Island NWR & Central FL/Brevard County Series

Viera Wetlands

Release 3.0
April 11, 2007

By: Robert J. Amoruso, Wildscape Images

Sandhill Cranes – Click Ponds

About the Wetlands – General Information

Viera Wetlands official name is *South Central Wastewater Treatment Plant* and is one of Brevard County's Wastewater treatments facilities. The wetlands is comprised of a series of impoundments or cells where nitrogen and phosphorous compounds that promote plant growth are removed naturally so that the treated water can be reintroduced into the environment or used for irrigation.

The wetland is man-made. The trees you see in the wet areas such as the Sabal (Cabbage) Palms and now dead pine tree were there before its creation. The plant species are listed on the "Wetlands Map and Trail System" brochure available at the Plant's office (see the end of this guide for a reproduction of the brochure) were planted as part of the wetland's creation. The technology used at the wetlands is one employed throughout the state as a means to treat wastewater while providing important habitat.

For those of you visiting the first time and not familiar with such a facility, there are no toxic emissions in the wetlands and the water is safe (but do not drink it). The wetlands brochure mentioned above lists some common sense rules but I would like to highlight a few.

1. Please keep your vehicle on the improved roadway.
2. Do not overtake other vehicles along the roadway.
3. Please do not block the roadway.

It has become accepted practice at the wetlands to drive off the road onto the shoulder when you are stopping to photograph from the car or will be getting out of the car. However, you should not drive long distances on the shoulders or in the grass. If overtaken by another car, pull over and let them pass. May causal observers in the wetlands force others to drive behind them at speeds far below the 15 MPH limit. For those observers in the wetlands that may have a specific destination, having to drive behind a slow moving vehicle is annoying at the least. Be considerate and pull over.

The other rule I wish to mention is the 7 AM to Dusk operating times. I have entered the wetlands as early as 5:45 AM, signed in and set-up for early sunrise photography or conducted workshops in the wetlands (I like to get there early so we are not fussing in the field setting up as the sun rises). I have never met any resistance going in that early or staying past sunset – just remember to sign in as requested and be reasonable as to how early you arrive or late you stay.

The Click Ponds are adjacent to the wetlands and if you visit them first, you should stop by the office and sign in before entering. The Plant's staff is friendly and welcomes your visit so please return the courtesy. **As of December 2006, sign-in was no longer required.**

About the Wetlands – Directions

The wetlands address is:

South Central Wastewater Treatment Plant
10001 North Wickham Rd.
Melbourne, FL 32940
(321)255-4328

To do a Google search for directions you will need to use the address; 8749 Wickham Rd N, Viera, FL 32940. The Plant's office is about 2 miles west from the address Google shows. Do not ask why, that is just the way it works out on Google. ☺

The image below is from TerraServer and based on a USGS map to help you orient yourself. The wetland is on the left side. This aerial image was taken in 1999 when the wetland was under construction. The I-95 Exit 191 interchange is at the right side of the image.

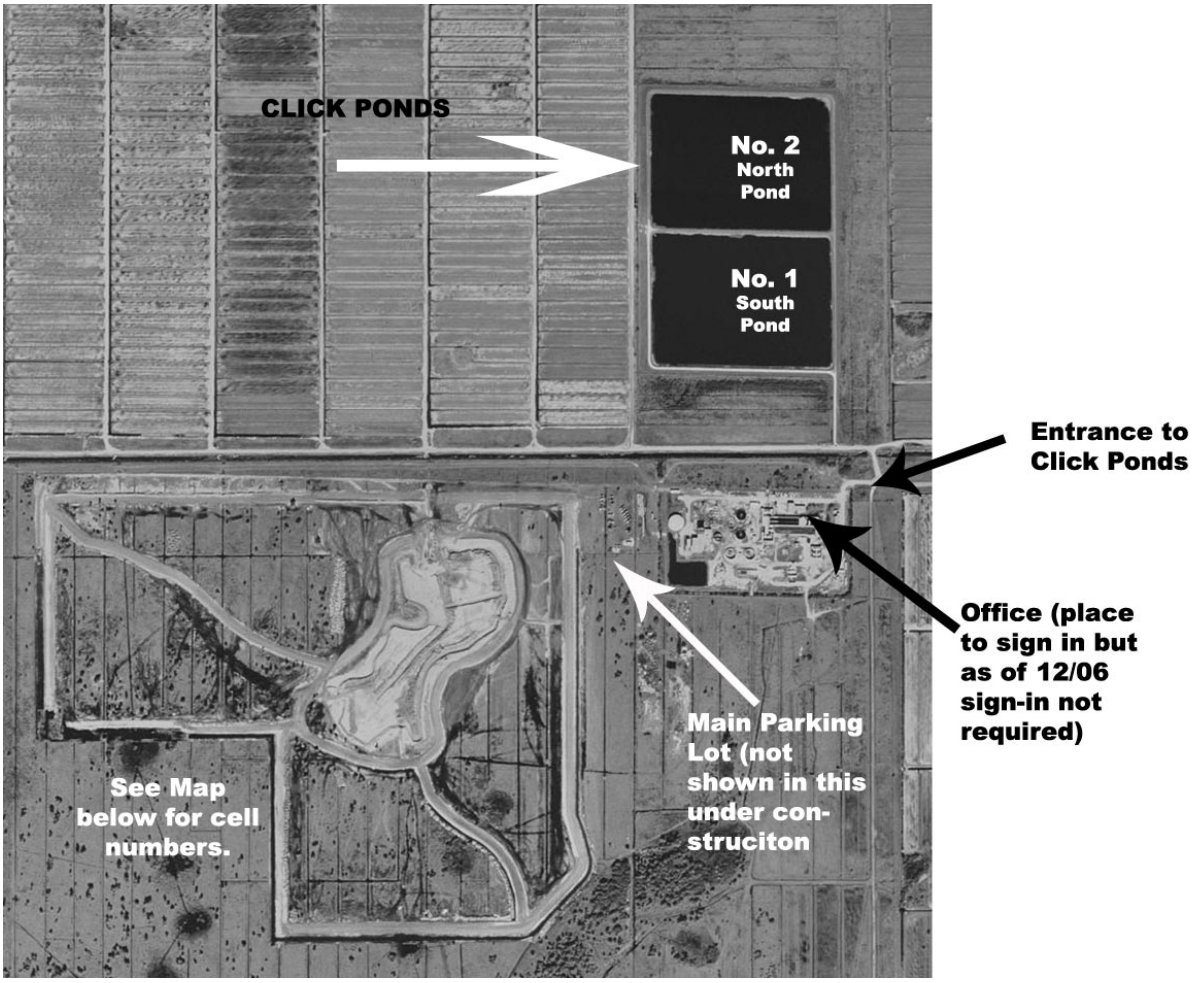
"Image courtesy of the USGS"

You get to Viera Wetlands from Exit 191 (Old 73) Wickham Rd. on Interstate 95. Viera Wetlands is near Melbourne, FL and is 14 miles south of the intersection of Route 528 (Beachline – formerly The Beeline) and Interstate 95.

Once you leave I-95 at Exit 191 Wickham Rd., travel west for about 2.5 miles to the plant's entrance on the left. Sign in at the plant's office and then proceed to the parking section.

The following maps and directions locate the wetlands Impoundments, the Click Ponds, and the wetlands office.

The Google maps used in the guide do not show the current state of construction in the area so expect changes.



"Image courtesy of the USGS"

About the Wetlands – Species Information

As with natural wetland areas, the types of birds, the numbers of birds and their activity level fluctuates with the seasons. In the winter and spring, the wetland is home to many birds including coots, Black-necked Stilts and Tree Sparrows. Year-round you will see the usual suspects; waders include Great & Snowy Egrets, Tri-Colored, Green and Great Blue Herons. White Ibis are plentiful as well.

Shorebirds make appearances throughout the seasons as well. In July of 2006, a group of shorebirds comprised of Stilt, Western, Pectoral, White-rumped & Least Sandpipers, Greater & Lesser Yellowlegs, Black-necked Stilts (breeding) and Semipalmated Plovers were present for many weeks at the North (Click) Pond after it was drained.

Avian species that breed in or near the wetlands include but certainly are not limited to Red-bellied Woodpeckers, Least Bitterns, Black-necked Stilts, Limpkins, caracaras, eagles, moorhens and Black-bellied Whistling Ducks.

An immature female Snail Kite was spotted in July of 2006 but Snail Kites are a rarity at Viera Wetlands.

The Brevard County's Natural Resources Management Office compiles a complete list of avian and other species sighted in the Wetlands. Notify Mr. Berry of any unusual sightings or nesting.

I have included the most recent list.

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raleigh.berry@brevardcounty.us

Bird Calls – Please Do Not Use Them In Viera Wetlands.

In the fall of 2006, a number of photographers were using bird calls to attract Barred Owl(s) into the wetlands from adjacent private lands. Raleigh T. Berry III, Associate Environmental Specialist, Natural Resources Management Office has requested that tapes not be played at Viera. Your cooperation is appreciated.

Viera Wetlands Hotspots

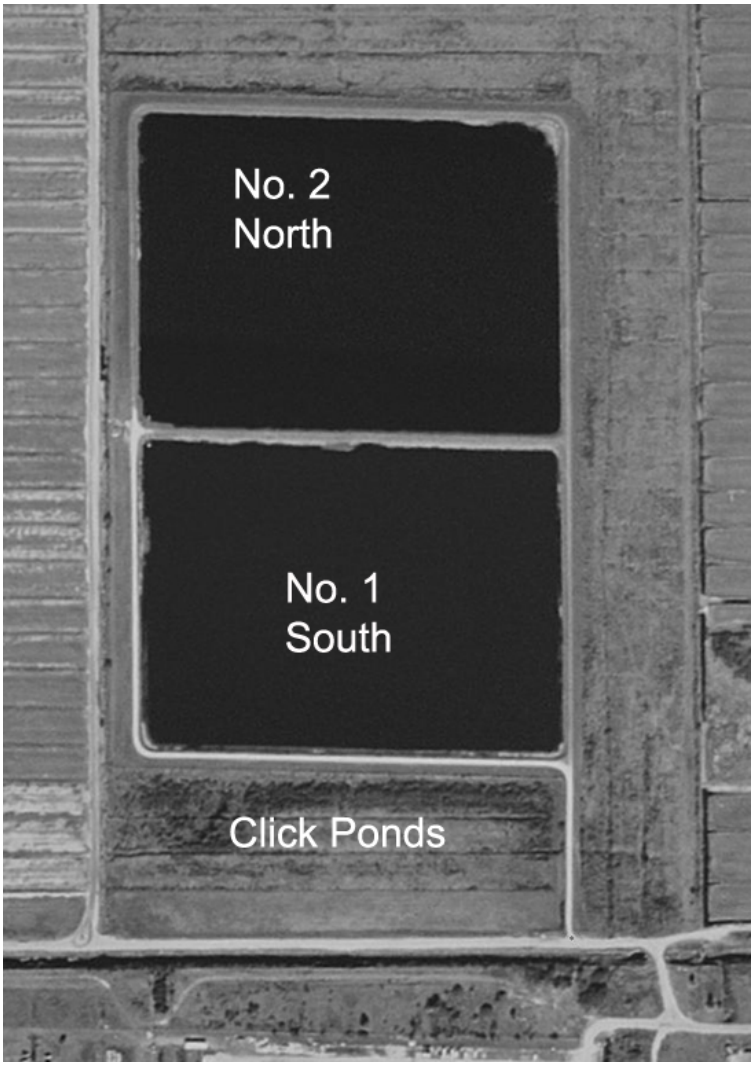
I have divided the sections of this guide into the Click Ponds, Cell 1, Cell 2, Cell 3, Cell 4 and the Lake

I have identified Hot Spots in the Guide and the map images either as a numeral (1, 2, 3…) or as alphanumeric (HS1, HS2….). The illustration below depicts the Cells and Lake but not the Click Ponds.

At the end of the guide, you will find the Viera Wetlands Site Map provided by Brevard County and available at the wetlands office or the links shown in the reference section.

The Click Ponds

The Click Ponds (below) are North and East of the wetlands and may be worth a visit.



I call the pond at the top the North or No. 2 Pond and the one at the bottom the South or No. 1 Pond.

Up until 2006, I had not found the ponds to be very productive for photography. You may see deer and bobcat, migratory birds in the spring and fall, and waders along the shore but the situation is not very intriguing when it comes to producing natural history images. However, that changed in 2006.

Because of the long drought in the spring of 2006, the water levels in the North and South Click Ponds became very low with much of the east side banks visible or barely submerged. In May through June of 2006, large concentrations of Sandhill Cranes (25 to 150), Roseate Spoonbills (5 to 50), Wood Storks (10 to 75) and an assortment of waders roosted overnight in the southeastern corner of the South Click Pond.

In July of 2006, the North Click Pond was drained into the South Click Pond. This caused roosting birds to move from the South Click Pond to the southwest corner of the North Click Pond.

This is not a yearly occurrence at the Click Ponds and I mentioned it to make you aware of the possibilities at the ponds. Do not overlook them when you visit. By August of 2006, photographic opportunities at the Click Ponds had ceased as the water level returned to normal.

Below are a few of the many images I created over the course of two months.

Sandhill Cranes (Intentional Blur), 7/30/06
Canon 1Ds Mark II with 600mm + 1.4xTC
1/8 sec, f/10, Mode: Av, Metering: Evaluative, Exp comp: +1, ISO: 800

Black-necked Stilts, 6/17/06
Canon 1D Mark II n with 600mm + 1.4xTC
1/1000 sec, f/8, Mode: Av, Metering: Evaluative, Exp comp: +1, ISO: 400

Sandhill Crane, 6/18/06
Canon 1Ds Mark II with 600mm
1/8 sec, 1/320 sec, f/4, Mode: Av, Metering: Evaluative, Exp comp: +1 1/3, ISO: 800

Cell 1

First stop is Cell 1, photographing at Hot Spots Nos. 1 and 2 (see below). Though Hot Spot No. 1 (**HS1**) is technically in Cell 2, I start out photographing at **HS1** for sunrise on most visits watching out what is going on at **HS2** right behind me.

So what's so great about **HS1**? In the stand of dead pine trees there is one particular one that I call *Silhouette Tree.* The Cormorants and/or Anhinga own this tree. Pre-dawn, position the camera so the tree lines up with the sunrise, and wait. What you may see and photograph are Cormorants awakening from a night's slumber, stretching wings and flying into and out of the tree.

There never seems to be a time when there isn't at least one Cormorant or Anhinga in that tree. Of course, in the AM, you are photographing into the sun, thus making silhouettes. In the afternoon, the sun will be at your back and you may be able to capture the Cormorants in sweet afternoon light. For me, the attraction is the morning and making images like this.

Original with some Canvas added in Photoshop on left.

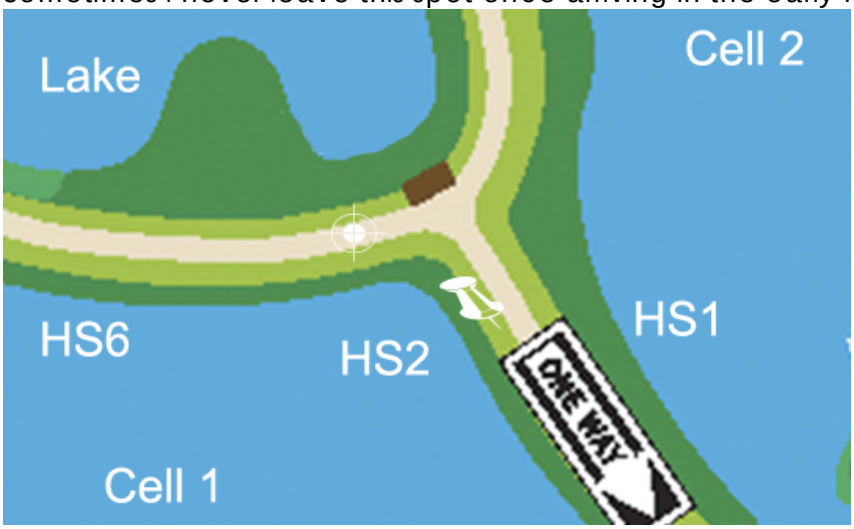
Canon 1D Mark II n with 500mm + 1.4x TC
1/1600 sec, f/9, Mode: Av
Metering: Evaluative, Exp comp: +2/3
ISO: 250, Cormorants, 2/7/06

Square Crop

A recent favorite of mine!

Anhinga, Canon 1Ds Mark II with 600mm + 2x TC, 8/26/06
1/6400 sec, f/16, Mode: Av, Metering: Evaluative, Exp comp: -1, ISO: 200

The area where Cells 1, 2, and the Lake meet is one of my favorites in the wetlands. Sometimes I never leave this spot once arriving in the early morning and photographing



until the sun is too high. While waiting for the Cormorants to wake with the rising sun, I pay close attention to **HS2** and **HS6** for activity from my vantage point on the access road between Cells 1 and 2 (pushpin on location diagram) or Cell 1 and Lake (bulls eye on location diagram).

At **HS6**, a tall stand of giant bulrush provides cover for American Coots and roosting Cattle, Snowy & Great Egrets and assorted waders. The waders will fly off around sunrise to go and feed in the wetland or the adjacent sod fields. Some will roost in the nearby Sabal Palms. The coots are present during migration in great numbers and given their propensity to "water walk" out of the protection of the bulrush, allow you to make coot blurs (see Shooting Techniques guide for details on blurs with and without flash).

Coots, 2/7/06
Canon 1D MKII n w/500mm,
1/100 sec, f/4
Mode: Av
Metering: Evaluative
ISO: 800

Exposure comp: +2/3, Flash exp comp: -1 2/3

Use this technique on the roosting waders as they flush from the bulrushes. Though the coots are only here during migration and winter, the egrets are found most times of the year.

Though I do not photograph the Lake much, I am always watching it for activity. Alligators are common in the Lake.

On a morning in February of 2006, an explosion of Tree Swallows occurred in the Lake at **HS21** (see Lake Section). A thick stand of soft-stem bulrush in the Lake due north from the "bull's eye" (in the location illustration above) was swarming with them. With a

500mm lens plus 2x TC I was only able to frame an environmental birdscape. So I pre-focused on the bulrush, stopped down to f/16, set the ISO to 800 to give me a 1/250 second shutter speed; high enough to freeze the birds but allow some slight motion/blurring of the wing flaps. I created over 200 images and picked those with the most pleasing arrangement of Swallows to keep. This is one of my favorites.

Tree Swallows
2/7/06
Canon 1DMkII n
500mm + 2xTC
1/250 sec, f/16
Manual
Evaluative
ISO: 800

You can find Tree Swallows, Red-billed Woodpeckers, ibis and European Starlings (an invasive – nuisance bird, introduced in 1890) at the dead trees at **HS2**. Standing at the "push-pin", the sun is at your back and you are in a prime location to make many excellent images like the following.

European Starling, 8/26/06
Canon 1DsMkII
I600mm + 2xTC
1/400 sec, f/8
Mode: Av
Metering: Evaluative
Exp comp: +2
ISO: 400
Flash: Off

Though only a lone Starling is present in this image, I used the strong diagonals of the snag to strengthen the composition.

During the spring and summer in 2006, a pair of Black-necked Stilts nested in a Sabal Palm frond boot that had fallen to the ground below the snags at **HS2**. Many exciting weeks

photographing the pair sitting on the eggs and fending off interlopers resulted. On June 11 of 2006, I finally saw the chicks a few days after hatching. The images below were taken with a 600mm f/4 IS Canon telephoto lens with stacked 2x and 1.4x teleconverters. Even with this combination, Canon EOS-1 cameras will focus grudgingly and using good long-lens technical (see the Shooting Techniques guide) sharp images are possible. Getting low also helps to heighten the impact of the images. To create this image, getting low was imperative.

Black-necked Stilt with two chicks (one is under the wing), 6/11/06
Canon 1D Mark II n and 600mm f/4 IS w/2xTC + 1.4xTC
1/400 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

Black-necked Stilt on remaining egg, 6/11/06
Canon 1D Mark II n and 600mm f/4 IS w/2xTC + 1.4xTC
1/500 sec, f/8, Mode: AV, Meeting: Evaluative -2/3, ISO: 400

Black-necked Stilt chick, 6/11/06
Canon 1D Mark II n and 600mm f/4 IS w/2xTC + 1.4xTC
1/250 sec, f/8, Mode: Manual, Meeting: Evaluative, ISO: 800

Black-crowned Night Herons frequent the area near **HS6** but many times are not in photographic range except when they venture out of the bulrushes. Note the side lighting that you will get here when photographing from the shoreline. I waited until the Heron turned his head in the left-hand image so that no shadows were present on the face. In the right-hand image, the bird is expelling a bolus.

Black-crowned Night Heron, 8/26/06, Canon 1D Mark II n & 600mm f/4 IS w/2xTC
1/1000 sec, f/8, Mode: Manual, Meeting: Evaluative, ISO: 400

Remember that it is generally best to point your shadow towards the subject or a few degrees off for the most pleasing light. However, strong side-lighting can create dramatic effects both on the subject and in the shadows of its surroundings as shown in the image below of the Green Heron at **HS6**. I waited until the Heron turned so that its face was not in shade and parallel to the sensor plane of the camera.

Green Heron, 8/26/06, Canon 1Ds Mark II and 600mm f/4 IS w/2xTC
1/1000 sec, f/8, Mode: Manual, Meeting: Evaluative, ISO: 400

Immediately after photographing the Night and Green Herons above, I noticed this smallish Alligator while walking back on the berm from **HS6** to **HS2** and captured the image below. Again, I placed myself at the water's edge and collapsed the tripod legs to the second lowest setting, leveled the sensor plane and made the image. See the Shooting Techniques guide for more on these techniques.

Alligator, 8/26/06, Canon 1Ds Mark II and 600mm f/4 IS w/2xTC
1/400 sec, f/8, Mode: Manual, Meeting: Evaluative, ISO: 400

Next stop is **HS3**, but don't overlook the areas between **HS2** and **HS3**. As you travel from **HS2** to **HS3** notice the cluster of deteriorating Sabal Palm and Palmetto to your right (west). They are a popular Black-crowned Night Heron roosting area. Seated low at the shore and using a flash with a better beamer and long lens will enhance your possibilities.

The **HS3** area in Cell 1 is near a water control structure, is frequently covered with Duckweed, and is a popular location for Least Bittern and moorhen breeding. In 2006, a White Ibis tried unsuccessful to nest here. This particular Ibis had crimson red lores (below). Again, the sun is at your back in the morning making for some great opportunities.

White Ibis
6/17/06
Canon 1D Mark II n
Canon 600mm
1/2000 sec, f/5.6
Mode: Manual
Metering: Evaluative
ISO: 200

Due to the one-way traffic on the wetland's berm road, you should not turn right after stopping at **HS3** to head to **HS4** and **HS5** but instead follow the berm road around to come back to this area.

Along the berm road where **HS4** is located, many possibilities exist with the morning sun at your back. The plantings along the shoreline provide habitat for small aquatic animals that attract herons, bitterns, ibises and scores of other birds. At various times of the year, I have observed Snowy Egrets flight fishing. They fly just above the water to scare potential prey into revealing themselves. With their head down in search of the aquatic prey, they may dunk their heads to catch them.

Canon 1D Mark II n
Canon 500mm w/2xTC
1/1600 sec, f/9
Mode: Manual
Metering: Evaluative
ISO: 400, 1/22/06

I would have preferred a slight head turn towards me in this image but I like the leg position and trailing water ripple where the Snowy has just lifted its legs out of the water.

Canon 1D Mark II n
Canon 500mm w/2xTC
1/1600 sec, f/9
Mode: Manual
Metering: Evaluative
ISO: 400, 1/22/06

Here the Snowy is doing the head dunk. Note the better light angle than the following image.

Canon 1D Mark II n
Canon 500mm w/2xTC
1/1600 sec, f/9
Mode: Manual
Metering: Evaluative
ISO: 400, 1/22/06

The Snowy has caught his fish after a head dunking. Note the less-than-perfect light angle and shadow on the right side of the body. I did capture the bird looking at me head-on and in this position, the flat wing position is acceptable with the diagonal of the wings helping to strengthen the composition. Wing & head position, light-angle and subject to sensor plane orientation are all considerations in capturing exceptional images. [1]

For these Snowy Egret flights, I position myself at the, pan with the bird and capture the action including the head dunks. When capturing these images, different positions in relationship to the bird will yield different results. You can stand "up-stream" of his flight-path and capture head-on flight images (actually not head-on). You can stand parallel but just up-stream to get a fly-by parallel to the camera. Once the bird flies by, stop photographing as bird's butt is not what you are looking to photograph.

My strategy here is to drive slowly along the berm road looking for possible subjects. When I find one, I usually try to approach the bird on foot. Sometimes it works and sometimes it does not. I have seen people walk the berm roads but this just seems to flush the birds.

If unsure about approaching on foot, first secure images from your vehicle and then proceed with an approach on foot. I recommend you park well past the bird, exit your vehicle from the side not in the bird's view, and approach stooped until you are at a place on the berm that offers you a good line-of-sight. Crawl or otherwise move slowly towards the subject, stopping to capture images in case the bird flies. When you are close enough, settle down and work the composition. If the bird is not looking at you, a noise may attract them. Making a loud "cccaaaccckkk" noise may get you the head turn without scaring the bird off.

Some examples of images along the shore from this area follow. Remember to consider the direction of light and the orientation of the bird to the camera to make pleasing photographs.

[1] See *Understanding Light-Angle, Subject-to-Film Plane Orientation, and Head-Angle,* BIRDS AS ART Bulletin No. 123 by Arthur Morris for more information.

Snowy Egret, 1/22/06, Canon 1D Mark II n and 500mm f/4 IS w/2xTC
1/640 sec, f/8, Mode: Manual, Meeting: Evaluative, ISO: 400

Green Heron, 1/22/06, Canon 1D Mark II n and 500mm f/4 IS w/2xTC
1/640 sec, f/8, Mode: Manual, Meeting: Evaluative, ISO: 400

HS5 along the west side of Cell 1 can be good in the afternoons for various birds working the shore and shallows and in the mornings for silhouettes of perching birds (below). A number of dead pine and palm trees exist in this area and make for good early morning sunrise silhouettes. Which crop is best in the image below?

The top image is a crop with canvas added to give the lead Boat-tailed Grackle somewhere to go.

I did this by adding 4 inches of canvas and then using the Selection Tool, chose the portion of the image in front of the lead bird. Then select Free Transform, grab the leading edge of the selection and drag to the end of the added canvas. Hit return and than CRTL-D to remove the selection. With the Clone Tool, fix up the edge created due to the Free Transform. CTRL-Z and zoom in and you will see it.

The bottom is the original. The action is the flying birds and the large dark portion of the palm is distracting.

By adding canvas, I gave room in the direction of flight and then cropped to emphasize the flying birds.

Boat-tailed Grackles, 8/5/06, Canon 1Ds Mark II with 600mm + 1.4xTC
1/2000 sec, f/9, ISO: 200, Mode: Av, Metering: Evaluative

Cell 2

Cell 2 is the next stop in the early morning after photographing at **HS1** and **HS2**.

As discussed in Cell 1, **HS1** is part of Cell 2 but is a prime early morning haunt for me as I photograph at Cell 1. See the Cell 1 discussion for more details.

In 2006, the bulrush along the eastern berm road of Cell 2 (**HS10**) had a good number of nesting Least Bitterns. In past years, the Least Bitterns were uncommon. We hope that the population of nesting Bitterns increases. I was at the wetlands when others were using bird calls to tempt them out into the open and captured the image shown below. See the section "About the Wetlands – Species Information" about why you should not be using bird calls in the wetlands.

Least Bittern, 7/9/06, Canon 1Ds Mark II
Canon 600mm f/4 IS and 2x TC
1/320 sec, f/8, Manual Exp., ISO: 400

The illustration below shows Cell 2 and its corresponding Hot Spots. In the mornings, the berm road on the east side of Cell 2 is the place to be. Arrive about 30 minutes after sunrise since the berm has a tendency to block the sun on the shoreline and the areas close to the shore until the sun rises a bit.

If your coming from the **HS1**/**HS2** location you will turn east at the end of the road and the first hot spot is **HS7**. This is a difficult area due to the angle of the sun. I have seen photographers jump out of the car and start photographing into the sun. There might be a few good backlit images but not a hundreds worth. No, your strategy is to move up the road a bit and get into a position where you are looking west. You will still have side lighting, but photographic possibilities exist when the bird or other subject is oriented correctly towards the sun (see the sidebar).

What is there to photograph at **HS7**? There is a group of vertical effluent discharge pipes here that attract birds when used. You may see Snowy Egrets and Green Herons perched on the pipe watching for prey to discharge from the pipe into the cell. Unless you are going for a close-up of the birds head, the pipe will be in the image and they are ugly.

So what's the deal with the subject's orientation towards the sun? For details I recommend you read *Understanding Light-Angle, Subject-to-Film Plane Orientation, and Head-Angle*, by Arthur Morris, BIRDS AS ART Bulletin No. 123. Artie's bulletins are available on his website at www.birdsasart.com in the bulletin archive. For more in-depth information, I recommend Artie's books the *Art of Bird Photography* (available in soft cover) and *Art of Bird Photography II* (available on CDROM). Both are available at www.birdsasart.com.

What you are really looking for are the birds that gather in the water and on the floating aquatic vegetation in search of a meal. I have seen all types of waders, ducks and shorebirds here various times of the year. As recommended for Cell 1, getting low and close to the shoreline usually yields better images. On one trip to the wetlands, I observed up to 50 waders at this spot. When I exited the car, the shore bound birds flew to the water but soon returned. The attraction that day must have been great to make them so tolerant of me. Other times, photographing from the car is your best bet (see the Shooting Techniques guide) if the birds are skittish.

How can you tell if the birds will tolerate you? Watch what they are doing and see if they are concentrating more intently on hunting for prey or watching you sitting in your car. If they are on the shore, in all likelihood they will fly if you get out. They seem to be most tolerant when they have some water between you and them. Some images taken at **HS7** are below.

In the image to the left, you get a nice view of one of the ugly effluent discharge pipes. What you do is focus on the birds face and torso as I have done in the image on the following page.

If you cut the legs as I have done, do so at mid-joint. DON'T CLIP… CUT! The rule of thumb is to cut midway over the length of the appendage. For feet; midway between the joints.

Snowy Egret, 9/11/05
Canon 1D Mark II with 500mm + 2xTC
1/2500 sec, f/8, Mode: Av, Metering: Evaluative, Exp comp: -2/3, ISO: 400

Laying low on the shore at **HS7** yields a bird's eye view of the action below and on the following pages.

Northern Shoveler

Lesser Yellowlegs, 10/29/05
Canon 1D Mark II, 500mm + 2xTC
1/800 sec, f/13, Mode: Av, Metering: Evaluative, Exp comp: -1, ISO: 400

Greater Yellowlegs, 10/29/05
Canon 1D Mark II, 500mm + 2xTC
1/1250 sec, f/11, Mode: Av, Metering: Evaluative, Exp comp: -1 1/3, ISO: 400

Lesser Yellowlegs Confrontation, 10/29/05
Canon 1D Mark II, 500mm + 1.4xTC
1/1000 sec, f/11, Mode: Av, Metering: Evaluative, Exp comp: -2/3, ISO: 400

On the preceding page, note the differences between the Lesser and Greater Yellowlegs. The beak of the Greater is longer than the head whereas the beak of the Lesser is about the same length as the head. Below was my close companion that morning (see the sidebar below).

Alligator, 10/29/05, Canon 1D Mark II, 500mm + 2xTC
1/400 sec, f/13, Mode: Av, Metering: Evaluative, Exp comp: -1/3, ISO: 400

HS8 has a nice stand of dead Sabal Palms that attract Anhinga, cormorants, Tri-colored Herons, and many others types of waders. I usually photograph from the car here and will create an image of anything roosting. The bulrushes and other vegetation at the base of the palms attract other species as well. You can usually exit the car here if you wish.

Alligators are present in the wetlands. When photographing from the edge of the shoreline, be cautious as to your proximity to the gators. Don't be overly worried, but be mindful for their presence. I have been within 20 feet of them when they have been in the water and I at the shore with no problems. On land, I give them a wide berth. At the Click Ponds, I have seen one at least 12 feet

HS9 is one of my favorite places in the wetlands. The Fragrant Water Lily attracts many types of birds. Since they come and go; I find my best strategy is to sit down at the water's edge, collapse the tripod to a comfortable position with me seated behind it and wait. I will also get as low to the water as I can get. Some examples of the images you may find there follow.

Don't forget to look up!

Anhinga in Flight, 6/17/06
Canon 1D Mark II n with 100-400mm @ 400mm
1/1000 sec, f/5.6, Mode: Manual, Metering: Evaluative, ISO: 400

And in the bulrushes!

Female Boat-tailed Grackle, 5/28/06
Canon 1Ds Mark II with 600mm + 1.4xTC
1/1250 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

And on the Water Lilies!

Female Boat-tailed Grackle on Fragrant Water Lilies, 6/18/06
Canon 1Ds Mark II with 600mm + 1.4xTC
1/800 sec, f/9, Mode: Manual, Metering: Evaluative, ISO: 400

Male Boat-tailed Grackle
On bulrush, 5/21/06
Canon 1Ds Mark II
500mm + 1.4xTC
1/800 sec, f/8
Mode: Manual
Metering: Evaluative
ISO: 400

In September of 2005, **HS9** was a favorite hangout for the Black-bellied Whistling Ducks and their chicks. In 2006, the Black-bellied Whistling Ducks were present and mating, then they were gone. Seeing them is not guaranteed. Some images from the 2005 nesting season follow.

Black-bellied Whistling Duck Adult with Chick, 9/11/05
Canon 1D Mark II and 500mm + 1.4xTC
1/320 sec, f/13, Mode: Av, Metering: Evaluative, Exp comp: -1/3, ISO: 400

Black-bellied Whistling Duck Chicks, 9/11/05
Canon 1D Mark II and 500mm + 1.4xTC
1/125 sec, f/18, Mode: Av, Metering: Evaluative, Exp comp: -1/3, ISO: 400

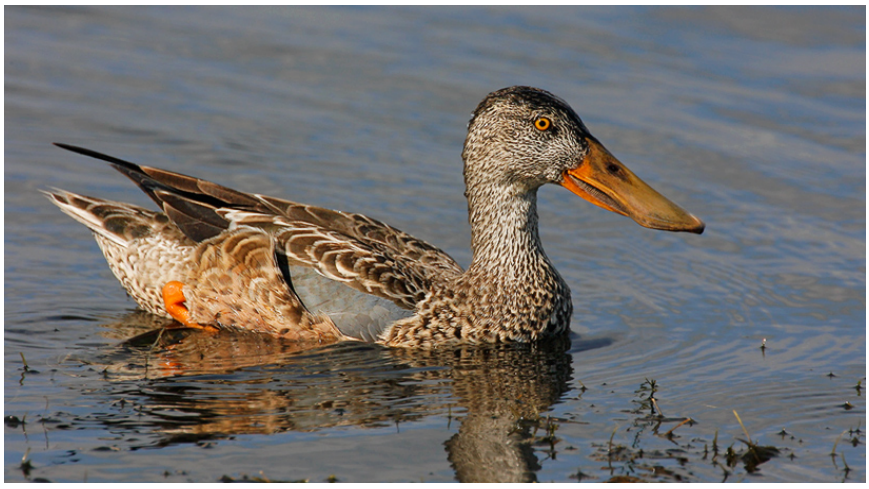
At **HS10,** you will find a large stand of bulrush. The Least Bitterns nest in the spring and summer and in 2006 were quite prevalent. Boat-tailed Grackles also nest in the bulrush. Two of my favorite Grackle images are the females hovering above the water looking for prey to bring back to the chicks and the male or female Grackles perched at the top of the rush, both shown below. At the beginning of this section, I led off with an image of a Least Bittern captured at **HS10** in 2006.

Female Boat-tailed Grackle, 6/17/06
Canon 1Ds Mark II with 600mm + 2xTC
1/500 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

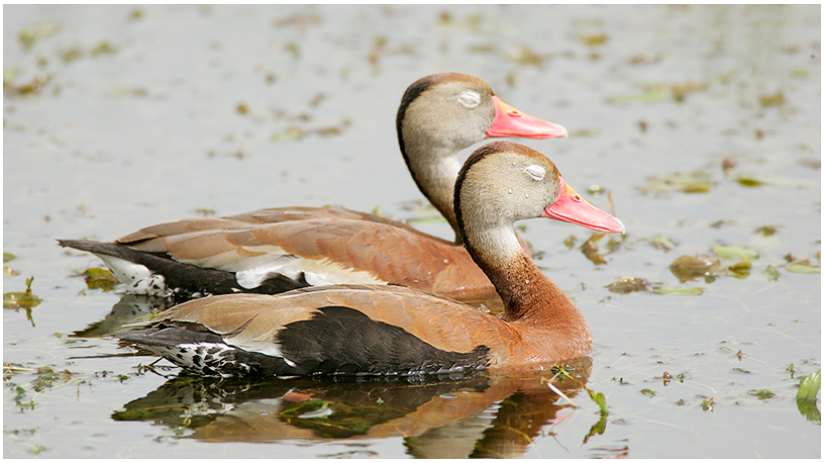
Female Boat-tailed Grackle, 7/9/06
Canon 1Ds Mark II
with 600mm + 1.4xTC
1/800 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

HS11 has a mix of vegetation that attracts waders of all sorts and is a good place for the migrant ducks in the fall and winter. The biggest problem here during the winter migration is the significant numbers of coots that get in front of the birds you are trying to photograph. I don't mind getting a good coot photograph, but enough already; don't swim in front of that duck facing me head on and doing a wing flap.

Ring-necked Duck flanked front and back by Coots, 1/22/06
Canon 1D Mark II n with 500mm f/4 and 2xTC
1/800 sec, f/10, Mode: Manual, Metering: Evaluative, ISO: 400



Northern Shoveler, 1/22/06
Canon 1D Mark II n with 500mm f/4 and 2xTC
1/640 sec, f/13, Mode: Manual, Metering: Evaluative, ISO: 400



Black-bellied Whistling Ducks, 6/17/06
Canon 1Ds Mark II with 600mm + 1.4xTC
1/500 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

Overcast days can be magical at the wetlands. The water can take on an iridescent glow due to the soft diffused lighting. I love these types of days and have made many of my favorite images, like the ones below, on them.

Least Bittern in the Open, 6/18/06
Canon 1Ds Mark II with 600mm + 2xTC
1/500 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 800

I was patient and captured the Least Bittern going in for the kill. The Bitterns generally stay in the bulrushes or otherwise undercover. On this particular day, this Least Bittern let me approach from my van on the berm road right up to the shore's edge. Along the way, I stopped to secure images in case I flushed him. I could tell though that the Bittern's attention was not on me as I approached and I was reasonably sure I would get quite close.

Note that I used ISO 800 on the overcast day to give me a bit of extra shutter speed in the low light.

Least Bittern Strikes, 6/18/06
Canon 1Ds Mark II with 600mm + 2xTC
1/640 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 800

HS12 occasionally has some good opportunities at an effluent discharge pipe. Waders may perch on them looking for prey. It is not one of my favorite places, but worth checking out when you drive by.

Bulrushes at **HS13** attract roosting Cattle and Snowy Egrets most times of the year. In the morning I will try for two types of images, backlight silhouettes of the departing egrets against the sunrise or in the afternoon/evenings flash blurs (see Shooting Techniques guide) when they fly back to roost. They usually return just as the sun is going down.

Cell 4

I am preceding Cell 3 with Cell 4 as this more closely follows my path through the wetlands.

HS14 seems to be a favorite Grebe hangout. They are one of my nemesis birds (definition: a bird that you cannot seem to get a good image of). Since they are small, I do try to get close and inevitably, they dive just before I snap the shutter so I have nothing to show you. I have seen many snakes in this area as well. Rails, coots, moorhens are also present. I like the vegetation in this area and have created many scenic images here.

A big attraction in Cell 4 in 2006 was a nesting pair of Limpkins. On most mornings, they were readily seen along the shore at **HS15** and **HS16** and from **HS16** to **HS17** searching for snails to feed the chicks. They would root around in the vegetation and once a snail was found, they would extract the soft portion and feed it to the chick. Even after the chicks had grown, I still saw the Limpkins in this area.

Strategy here has not changed; low to the ground and sun at your back. The birds will move in and out of favorable light as they turn, so be ready. You want the eye in focus and the head parallel or slightly turned towards you. In the case of the Limpkins, they were exceptionally tolerant of photographers, walking right by them and once walking right under the legs of the tripod. Be ready and have a short zoom that focuses close. Whether you will find Limpkins on your visit remains up to them.

Limpkin Chick, 5/21/06
Canon 1D Mark II n, 600mm + 2 x TC
1/1600 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

At **HS17** is a Tropical Hammock (small island) where deer have been spotted in the past. Though I have seen them, I have not made a good image of one. Pickerelweed is prevalent in Cell 4 and **HS17** is no exception. In that weed are waders foraging for food. Give a loud "cccaaaccckkk" noise to see if any heads come up. In the mornings, sun angle is not good; afternoons are better but I did capture the image below of a Sandhill Crane foraging in the morning.

However, note the high contrast and less-than-perfect light angle. The orientation of the sun and the wetlands cell did not allow me a better angle.

What I do like is the repetition of the colorful Pickerelweed flowers with the head and neck of the Crane mimicking that tall vertical pattern.

Sandhill Crane in Pickerelweed, 5/6/06
Canon 1Ds Mark II, 600mm + 2 x TC
1/200 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 800

Cell 3

Cell 3 is probably the area I have visited the least except for the lake. It is heavy in Pickerelweed so waders are obscured from view. Though many dead snags of pine and palm offering perching locations for the birds exist, many are too far away for photography.

However, three areas are worth noting. At **HS18** in the afternoon, a stand of palms and other snags attracts roosting waders (especially ibises). The sun will be at your back in the afternoon as you look east into this area.

The back berm road on the west side of Cell 3 can be good in the morning for silhouettes though I find other areas more productive.

If you drive up the road between Cells 3 and 4, look for waders in the Pickerelweed and other opportunities. If you continue along Cell 3's west berm road, you will come to

HS20 where there is an Eagle's nest in a stand of slash pine many 100's of yards out looking southwest. Though they are too far out for any good photographs, they do fly over the wetlands and come to perch on the snags in Cell 3. You may get lucky and catch them flying in or perching.

The elevated observation deck at **HS19** can be great for flight photography. In the mornings when the roosting birds take off and in the late afternoon on their return, opportunities exist. I will observe the area from other points in the wetlands (this is where binoculars come in handy) and if I notice activity head over. There are also a number of dead snags close by that offer good opportunities for roosting, take-offs and landings.

Great Egret (40% of original), 10/10/05
Canon 1D Mark II
500mm + 2xTC
1/1000 sec, f/9, ISO: 500
Mode: Manual
Metering: Evaluative

Common Crows and White Ibis, 10/11/05
Canon 1D Mark II
500mm + 2xTC
1/1000 sec, f/8, ISO: 400
Mode: Manual
Metering: Evaluative

White Ibis (Intentional Blur) 10/11/05
Canon 1D Mark II with 500mm + 2xTC
1/6 sec, f/18, ISO: 50, Mode: Tv, Metering: Evaluative, Exp Comp: -1

White Ibis, 10/10/05
Canon 1D Mark II with 500mm + 2xTC
1/1250 sec, f/8, ISO: 500, Mode: Manual, Metering: Evaluative

Lake

The Lake is deep in many locations so it does not attract many birds except for the locations discussed below. You may also see a few birds along the shore. The alligators like it and ducks are common at various times during the year around **HS22**.

I discussed the Tree Swallow images I made at **HS21** in the Cell 1 Section and captured the Great Blue Heron with attitude below along the shore at **HS22**.

Great Blue Heron, 8/26/06
Canon 1Ds Mark II with 600mm + 2xTC
1/2000 sec, f/8, ISO: 400
Mode: Manual, Metering: Evaluative

Because it is shallow at **HS23**, waders and ducks are attracted to this location. With a selection of dead snags, flight photography is possible. In the morning, you are photographing into the sun and in the afternoon, you have the sun at your back.

UPDATE: A snag at **HS23** has become a popular morning roosting spot for one of the Bald Eagles (image above) that nests just off the wetlands property. Keep a lookout for them when at the wetlands.

At **HS24**, you may see flocks of ibises and other waders gathered. In the morning, it is backlit with the best light on the area occurring prior to sunset. I have not been too successful making images here but I do check it out from time to time.

The observation deck that overlooks the lake has never been productive for me.

General Impressions of Viera Wetlands and Misc. Information

If You Have Only One Day!

After reading the Click Ponds and Cell 1 sections, you probably have a good idea what my recommendation is but I will reiterate. If I had only one day; and preferably the morning; my modus operandi would be HS1 and HS2 following up by HS9 and HS10.

Easily the area between **HS1** and **HS2** is my favorite and as I mentioned before I sometimes never get past this point. In the morning, I get my sunrise silhouette photographs at **HS1** and then move to photographing **HS2** as the sun comes up. One of my favorite images is of a Green Heron that was fishing on top of the floating vegetation. He saw a frog a few feet away and made a mad dash for it over the vegetation wings flapping allowing me to capture the image below.

Green Heron, 10/29/05, Canon 1D Mark II with 500mm + 2xTC
1/800 sec, f/8, Mode: Av, Metering: Evaluative, ISO: 640

As mentioned, **HS2** was where the Black-necked Stilts nested in 2006. I will position myself on the shore and wait for the birds to come to me. However, I often resist the temptation to stay here until the sun is too high as my next stops at **HS9** and **HS10** can be equally well productive.

The Click Ponds proved to be incredibility active in the summer of 2006, but this is not usually the case and in the past, I have not found much there. For whatever reason and before word got out, I drove up there one morning in June just before sunrise and found a large group of Sandhill Cranes (25 to 150), Roseate Spoonbills (5 to 50), Wood Storks (10 to 75) and an assortment of waders roosting overnight in the southeastern corner of the South Click Pond. The sun was rising and they were getting ready to leave; when I got out of the van many of the birds flew. The next morning I arrived ½ hour before sunrise and was able to set-up outside my van without disturbing them. For almost two months in 2006, the Click Ponds were the place to be.

When it's Quiet

There are going to be times when you arrive at the wetlands and nothing is going on. That happened to me once during a Wildscape Images PPIW (Personalized Photographic Instructional Workshop) in April of 2006. All the birds had flown the coop; well not all but it was quiet. This is when you need to look around at the nature that surrounds you and make soup from a stone.

I try isolating patterns of vegetation against the water. Photography is about light and I look for exceptional light to show common elements in new and interesting ways.

In designing an image, remember that composition is about arranging the elements of a scene in a complimentary manner that is aesthetically pleasing. A long discussion about composition is beyond the scope of this guide. Be open to the possibilities and as you look at a scene, MOVE. Bend your knees, stand on your toes, move left and move right. Rearrange the elements of the scene by moving about.

"The Arrival"
Fragrant Water Lily and Bee, 4/9/06
Canon 1D Mark II n with 600mm + 2xTC
1/1250 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

Wetland Grasses, 4/9/06
Canon 1D Mark II n with 70-200mm + 1.4xTC (98-280mm @ 280mm)
1/160 sec, f/9, Mode: Manual, Metering: Evaluative, ISO: 400

Even on slow days, you may find an obliging Anhinga. The background here is overcast sky yielding a high-key effect.

Anhinga, 4/9/06
Canon 1D Mark II n with 600mm + 2xTC
1/400 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

Caracara

Caracaras have been nesting in the wetlands or on properties adjacent to it. In 2005 a pair unsuccessfully attempted to nest in the Sabal Palm in the wetlands parking area. The image below was taken in September of 2005 in the parking area. This year a pair successfully raised three juveniles and seen regularly in the wetlands as a group though as of September of 2006 I had not seen them in almost a month.

Caracara, 9/24/05
Canon 1D Mark II n, 500mm f/4 IS
1/1600 sec, f/9, Mode: Av, Metering: Evaluative, Exp comp: -1/3, ISO: 400

Caracara, 6/17/06
Canon 1D Mark II n, 600mm +2xTC
1/640 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

In the image above of the 2006 Caracara family, I would have preferred to have all the birds heads turned parallel to the sensor/film plane. It was not to be because after a few images in various less-than-satisfactory positions the adult and three juveniles flew off.

References

1. The Brevard County South Central Wetland map is provided by the Brevard County Water Resources Department and available at the following site: http://countygovt.brevard.fl.us/usd/documents/Wetlands%20Map.pdf and http://countygovt.brevard.fl.us/usd/documents/Wetlands%20Brochure.pdf. These maps are included with this site guide for information only.

2. Brevard County's Natural Resources Management Office, Bird & Wildlife Species Checklist.

3. Annotated map images obtained from USGS and http://terraserver.microsoft.com/. From the TerraServer website FAQ: The images are from the U.S. Geological Survey, and are freely available for you to download, use and re-distribute. The TerraServer team and the USGS appreciate credit for their work on this project by displaying the message "Image courtesy of the USGS".

ANIMAL SPECIES CHECKLIST

Birds:

_____ Bald Eagle
_____ Great Blue Heron
_____ Crested Caracara
_____ Snowy Egret
_____ Great Egret
_____ Little Blue Heron
_____ Green Heron
_____ Blue-Winged Teal
_____ Mottled Duck
_____ Common Coot
_____ Marsh Hen

Reptiles:

Alligators:
_____ American Alligator

Turtles:
_____ Peninsula Cooter
_____ Florida Cooter
_____ Florida Red-Bellied Turtle
_____ Smooth Softshell Turtle

Snakes:
_____ Florida Water Snake
_____ Florida Cottonmouth
_____ Red Rat Snake
_____ Yellow Rat Snake
_____ Southern Black Racer

Lizards:
_____ Green Anole
_____ Brown Anole

Toads:
_____ Southern Toad

Frogs:
_____ Bullfrog
_____ Pig Frog
_____ Green Tree Frog
_____ Squirrel Tree Frog
_____ Southern Leopard Frog

Mammals:

_____ River Otter
_____ Virginia Opossom
_____ Nine Banded Armadillo
_____ Raccoon
_____ White Tail Deer
_____ Wild Hog
_____ Marsh Rabbit

RULES AND REGULATIONS

- Please sign in at the Plant Office before entering the site.
- The wetland site is closed between dusk and 7 AM.
- Vehicle Speed Limit is 15 MPH.
- Please keep your vehicle on the improved roadway.
- Do not overtake other vehicles along the roadway.
- Please do not block the roadway.
- Vehicles and bicycles are allowed on the Berm Trail.
- The Berm Trail may be closed to vehicles following heavy rains or for other reasons.
- Firearms, fireworks, fires and alcoholic beverages are prohibited.
- Hunting, fishing, boating, wading and swimming are prohibited.
- Please stay off the Water Control Structures and Pipes.
- Please do not feed the wildlife.
- Harassing the wildlife is prohibited.
- Please keep pets on a leash.
- Please do not litter.

FOR YOUR SAFETY

Please return to the safety of your car if lightning should appear or thunder can be heard. The Observation Decks are closed when thunderstorms are in the area.

PRESERVE WATCH

The Brevard County Water Resources Department strives to keep the Wetland clean and beautiful. However, some park users do violate these rules. Help us protect the wetlands and environment by reporting any abusers to (321)255-4328 in the case of a serious offense.

WETLAND MANAGMENT

THE BREVARD COUNTY SOUTH CENTRAL WETLAND IS MAINTAINED BY THE BREVARD COUNTY WATER RESOURCES DEPARTMENT.

PLANT TOURS CAN BE SCHEDULED WITH THE PLANT SUPERVISOR UPON REQUEST.

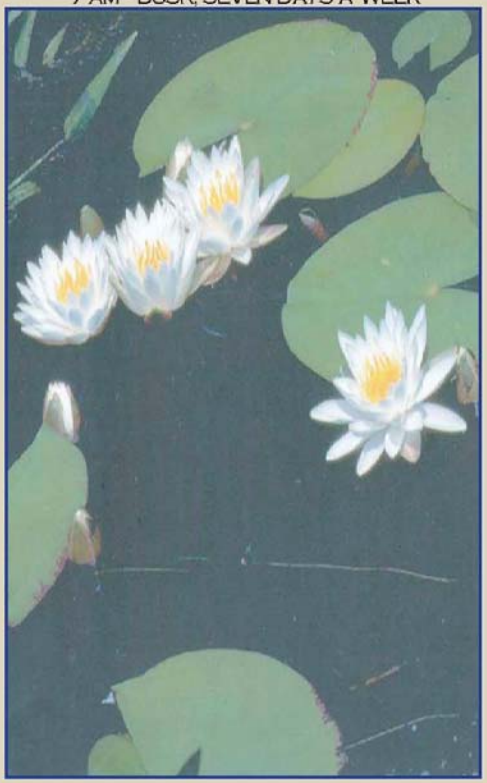
FOR QUESTIONS, COMMENTS OR PROBLEMS PLEASE CONTACT US AT
(321) 255-4328
WWW.BREVARDCOUNTY.US/WATER RESOURCES

BREVARD COUNTY SOUTH CENTRAL WETLAND

BREVARD COUNTY, FLORIDA

WETLAND MAP AND TRAIL SYSTEM

PARK HOURS:
7 AM - DUSK, SEVEN DAYS A WEEK



BREVARD COUNTY
SOUTH CENTRAL WETLAND
BREVARD COUNTY, FLORIDA
WETLANDS MAP AND TRAIL SYSTEM

PARK HOURS:
7 AM - DUSK, SEVEN DAYS A WEEK

Plant Species Checklist

Lake Plantings
_____ Sawgrass
_____ Buttonbush
_____ Pickerelweed
_____ Spikerush
_____ Spatterdock
_____ Fragrant Water Lily
_____ Cordgrass
_____ Softrush

Cells 1 and 2
_____ Fragrant Water Lily
_____ Giant Bulrush
_____ Spatterdock
_____ Soft Stem Bulrush

Cells 3 and 4
_____ Arrowhead
_____ Blue Flag
_____ Bushy Pondweed
_____ Coontail
_____ Duck Potato
_____ Fire Flag
_____ Pickerelweed
_____ Sawgrass
_____ Spikerush
_____ Soft-Stem Bulrush
_____ Wild Rice

Trees and Shrubs
_____ Bald Cypress
_____ Buttonbush
_____ Carolina Ash
_____ Coco Plum
_____ Dahoon Holly
_____ Hackberry
_____ Leather Fern
_____ Loblolly Bay
_____ Red Cedar
_____ Red Maple
_____ Royal Fern
_____ Pond Apple
_____ Pond Pine
_____ Slash Pine
_____ Swamp Tupelo
_____ Sweet Bay
_____ Wild Coffee

ABIRDS AS ART - Wildscape Images
Photographer's Site Guide

Merritt Island NWR & Central FL/Brevard County Series

Canaveral National Seashore

Release 3.0
April 10, 2007

By: Robert J. Amoruso, Wildscape Images

Tidal Pools - Canaveral National Seashore, Playalinda Beach

INTRODUCTION

The following was taken from the NPS Canaveral National Seashore website and is publicly available for download [1]

"Canaveral National Seashore (CANA) was created by an act of Congress on January 3rd, 1975 to "...preserve and protect the outstanding natural, scenic, scientific, ecologic, and historic values of certain lands, shorelines, and waters of the State of Florida and to provide for public outdoor recreation use and enjoyment of the same...".

The park contains 58,000 acres of barrier island, open lagoon, coastal hammock, pine flatwoods and offshore waters along the east central coast of Florida. It represents an excellent example of a relatively stable barrier beach backed by a productive lagoon system.

The park's 24 miles of undeveloped beach is the longest such stretch on the east coast of Florida. Mosquito Lagoon, which comprises over two-thirds of the park, is designated an Outstanding Florida Water and as a part of the 155-mile long Indian River Lagoon (IRL), an Estuary of National Significance. The IRL is considered the most diverse and productive estuary in North America. Mosquito Lagoon supports nationally-recognized commercial and recreational fisheries for finfish, clams, oysters, blue crabs and shrimp. The park provides habitat for 14 federally-listed (Threatened and Endangered) animal species, ranking it second in the entire National Park Service. Three sea turtle species deposit approximately 4000 nests on the beach each year. Large numbers of waterfowl and wading birds utilize the Seashore as a migratory stopover and wintering ground. Located along the "frost line", the park contains a rich and unique mixture of subtropical and temperate plants found nowhere except central Florida.

CANA is superb example of a national park unit where interagency cooperation is paramount. Located at the northernmost end of Kennedy Space Center, approximately two-thirds of the park is owned by NASA and much of that is co-managed with the adjacent Merritt Island National Wildlife Refuge. The park is working with these agencies on numerous projects such as feral hog control, exotic plant removal, restoration of impacted wetlands, long-term monitoring of natural resources and implementation of prescribed fire. Additional partnerships with state and local agencies include sea grass monitoring, mosquito control, water quality monitoring and law enforcement patrols."

[1] Canaveral National Seashore Nature and Science Overview: http://www.nps.gov/cana/naturescience/upload/N&S%20Overview.pdf

About This Guide and its Nomenclature

When you enter Canaveral National Seashore by heading south from the fee booth, you will be traveling on Playalinda Beach Road that pass wetland areas along Mosquito Lagoon on the north side of the road and areas adjacent to the Shuttle launch towers on the south side of the road. Along this portion of the road are 8 pull-offs that provide views of the wetlands and the shuttle launch towers. After approximately 3.5 miles, you come to a sharp left turn, which parallels the seashore and provides access to 13 parking areas. All of the parking areas have boardwalks crossing the dunes to the beach.

The seashore parking areas are numbered and I have duplicated that numbering on my location maps. The access road wetlands pull-offs are not numbered. My numbering is for reference in this guide only.

Key

- **S1, S2, S3, S4** .... Are the wetlands pull-offs on the access road before you reach the shoreline.
- **PL1, PL2, PL3** .... Are the parking lots along the seashore portion of the access road. These lots are numbered.

This Site Guide covers the southern end of Canaveral National Seashore, which includes the wetland areas along Mosquito Lagoon on the north side of the access road and areas adjacent to the Shuttle launch towers on the south side of the road as well as Playalinda Beach on the Atlantic Ocean.

The first section includes images that I have made while at the seashore. The second section includes a set of maps with various locations identified that I discuss.

The Beach

To reach the seashore, drive approximately 3.5 miles through the wetlands from the fee station. Once you make the sharp left at the end of the drive, you are heading north along the dune crossover access road. Thirteen (13) parking areas along this road offer access to the beach. Each contains a permanent restroom facility. There are no other facilities or running water at the seashore so bring food and water with you. Parking areas are numbered.

Parking Area 13 is the furthest most north lot and provides access to the northern portion of the beach know as Klondike Beach. Klondike is primitive, considered backcountry and not generally visited. You will have to hike from Lot 13 if you want to explore it. Be warned that the beaches at Lot 13 are an “unofficial” nude beach. Even though a Brevard County Ordinance exists banning nude bathing, the NPS and the County ignore the nude bathers. You may want to avert your eyes as well as it is not always a pretty sight.

If you do decide to investigate this area, you will have to walk by the nude bathers. You should also know that photographers carrying long lenses might receive scrutiny from them. I am not trying to scare you away from investigating that part of the beach, just making you aware of possible issues.

My favorite part of the beach is between Lots 4 and 5. I will park in one or the other and walk to a point mid-way between them. Generally, as the beach gets busy, most bathers plant themselves within a few feet of the dune crossovers leaving you relatively alone.

My strategy at the beach is:

- arrive at pre-dawn,
- capture slow shutter speed abstracts of the waves,
- photograph the sunrise,
- create silhouettes of the shorebirds as they cross in front of the golden rays on the beaching waves,
- if it is low tide, turn back toward the dunes (which face west) and capture the birds that may be on the beach and illuminated by the rising sun,
- keep an eye open for any other opportunities.

By its nature, the beach is ever changing so I find new and exciting things to photograph each time I go. I cannot remember coming home without at least one great image.

If it is winter, I usually wrap up between 8 or 9 in the morning and head over to MINWR. If it is summer and the water is warm, I shed my shooting clothes, (do not fear as I have my bathing suit on underneath) and head into the water for some great body boarding with my wife. Both of us have grown up on the Atlantic Ocean, love to body board and make this a typical summertime activity – some photography and some water athletics. If body boarding is involved, I generally leave the seashore around 11 am.

In the summer, my longer stays usually result in a new endeavor I started in 2005. One time after a long stretch of boarding, I was relaxing in my beach chair watching the breaking surf. It was probably around 10:30 am. I noticed in the waves the reflections of the sun, which is high in the sky by now resulting in high-contrast. However, the reflections were causing streaks that looked like lighting in the waves. Using my long lens, I set the ISO to 50, chose a very small f/stop to get a slow shutter speed (1/15 to start) and using evaluative metering in TV mode, create blurs and pan blurs of the waves.

The results were surprising and IMO quite beautiful. I have included an example in the images section of the guide. Go to Shooting Techniques guide for a more in-depth discussion on blurs.

Flight photography can be good when you stand on the top of the boardwalks and capture the Brown Pelicans, gulls or terns as they pass close by riding the thermals coming off the dunes. On windy days, this can be quite good but the Pelicans will only be around if there are fish in the ocean for them to pursue. If you get low on the

boardwalk, they may fly right over. If you are standing and their flight path is over you, they will generally veer off to avoid you.

Other things to look for are the Brown Pelicans skimming the surface of the ocean and breaking waves or splashing down to catch a meal. Gulls and terns are constant visitors. The most popular shorebirds that you will see are Willet, Sanderling and Ruddy Turnstone. During migration, Black-bellied Plover is seen. Waders such as White Ibises and Reddish Egrets can be seen and a visit by a Snowy Egret or Great Egret is not unknown. Both species of vultures are also common.

Look for marsh rabbits at the sides of the roads, gopher tortoises near the roads and parking lots as well as snakes sunning on or crossing the pavement.... be careful for them when driving.

Though my favorite locations for photographing are at Lots 4 or 5, the other lots offer similar opportunities and should not be over-looked.

The Wetlands

As you drive towards the beach you will pass eight pull-offs that allow you to view various portions of the wetlands. At **S7** and **S8** you will have a good view of the Space Shuttle launch towers and if the shuttle is on the pad a great photo opportunity (light is better in the afternoon but early morning is A-OK too especially in overcast conditions. You are looking south so frontal lightning is not something you can get either in the morning or in afternoon however.

My strategy at the wetlands is to slow down as I pass the pull-offs (**S1** through **S8**) and look for activity. If you see any interesting subjects close to the pull-off, turn in for a closer look. Occasionally, when I am driving along Playalinda Beach Rd. by the wetlands I have seen groups of waders moving from the wetlands areas on one side of the road to the other. If this is near a pull-off, I will stop and position myself with my back to the sun and photograph flight.

NOTE: You are not allowed to pull-off onto the grass on the side of the road. If you do, the Park Ranger may stop you. Use the pull-offs and walk to the location. The reason driving on the grass is prohibited is Killdeer nest in certain areas along the road and turtles, snakes and Scrub Jays can be found there as well.

As mentioned in the MINWR Guide, Biolab Road exits onto Playalinda Beach Rd. just after **S3** when heading east. Since converting the road to one-way south in 2006, a great access point from the beach that allowed me to get to my favorite places at the south end of Biolab Rd. are no longer easily accessible. I would have to enter at the North end and drive all the way back down to the south end (an additional 10 miles of driving to an area just ¾ of a mile North from the former access point off of Playalinda Beach Road). Check at the fee station during November-February about access to Biolab Rd. from Playalinda Beach Rd, as it may be open from Playalinda on certain hunt days.

Over the past several years, a pair of Black-necked Stilts has chosen to build a nest on the south side of the road at **S7**. In 2006, they abandoned the nest. Unfortunately, getting good light here is a problem unless it is overcast since you are looking south; it is worth checking out though during nesting season.

Images from Canaveral National Seashore

Sanderling | Canaveral National Seashore - Merritt Island, FL | 8/6/05 | 52% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | 1/1000 | f/16 | -1 Eval. Comp. | ISO 400

Sanderlings | Canaveral National Seashore - Merritt Island, FL | 8/13/05 | 45% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 1.4x TC | 1/2000 | f/10 | -1 Exp. Comp. | ISO 640 | Handheld

The above images were created on the seashore between **PL4** and **PL5** in the morning in August of 2005. The beach erosion had created elevated dunes on the beach in front of the main dunes. Photographing with my back to the water/sun, I photographed the Sanderlings in the top image checking me out and caught the Sanderlings in the bottom image as they raced by me in the sand. It looks like a road race. Sanderlings will approach you closely but will run by in that last few feet to get past.

Sanderling | Canaveral National Seashore - Merritt Island, FL | 7/30/05 | 85% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | 1/2500 | f/8 | ISO 800 | -1 Evaluative | -3 Fill Flash Compensation

Sanderling, 10/26/06
Canon 1Ds Mark II, Canon 600mm f/4 IS with 1.4x TC
1/200 sec, f/5.6, Av - Evaluative, Exp comp: +2/3, ISO: 800, Flash: On

Sunrise silhouettes are a common opportunity in the morning on the beach like this backlit images image of the Sanderling above. In the bottom image above, an overcast sky allowed me free movement and positioning to photograph this Sanderling. The Sanderling is aggressively fending off interlopers hence the tense stance. Both were captured at my favorite location between **PL4** and **PL5**.

Sanderling | Canaveral National Seashore - Merritt Island, FL | 8/6/05 | 40% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | 1/1600 | f/8 | -1 Eval. Comp. | -2 1/3 Fill Flash | ISO 500

Another AM sunrise silhouette of a Sanderling captured between **PL4** and **PL5**. To create this type of image, I first find some shorebirds that are moving down the shoreline. I then get ahead of them before they come to the sun's golden rays on the water. I photograph low, work out exposure for the sun-drenched water, and light the bird with flash. Without flash, you will get a silhouette.

To get ahead of the shorebirds in the direction they are heading, pass them well away from the shoreline up near the dunes.

Sanderlings, 8/28/05
Canon 1D Mark II, Canon 500mm f/4 IS with 2x TC
1/4000 sec, f/11, Av - Evaluative, Exp comp: 0, ISO: 800 (which was too fast)

Sanderlings squabbling above, I have observed aggressive tendencies from these small birds on a regular basis so keep a watchful eye out. Photographed between **PL4** and **PL5**.

Ruddy Turnstone, 8/13/05
Canon 1D Mark II, Canon 500mm f/4 IS with 1.4x TC
1/1600 sec, f/10, Av - Evaluative, Exp comp: 0, ISO: 640 (which was too fast)

Ruddy Turnstone shaking its head and sending off a ring of water around the head. Photographed between **PL4** and **PL5**.

Willet | Canaveral National Seashore - Merritt Island, FL | 8/6/05 | 52% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | 1/400 | f/10 | +1 Eval. Exp. Comp. | +3 Fill Flash | ISO 500

The Willet above is discharging a bolus (ball-shaped, non-digested organic structure). Photographed between **PL4** and **PL5**.

Kayaking Fishermen | Canaveral National Seashore - Merritt Island, FL | 8/6/05 | 55% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | 1/640 | f/10 | ISO 500

Other opportunities such as the kayaking anglers above will present themselves. This is a pre-dawn image photographed between **PL4** and **PL5**.

Beach Sunflower | Canaveral National Seashore - Merritt Island, FL | 8/6/05 | 55% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | 1/1600 | f/10 | -1 1/3 Eval. Comp. | +3 Fill Flash | ISO 400

Beach Sunflowers are present much of the year. Macro photographs and environment images are readily made in beautiful sunlight in the morning. Photographed between **PL4** and **PL5**.

Ghost Crab | Canaveral National Seashore - Merritt Island, FL | 7/30/05 | 60% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | 1/400 | f/10 | -2/3 Evaluative | ISO 500 | No Flash

Ghost Crab | Canaveral National Seashore - Merrit Island, FL | 76% of Capture | 8.2 MP
Canon 20D | Canon 500mm f/4 IS with 1.4x TC | 1/1600 @ f/13 | ISO 400 | AV Evaluative at -1 Exp. Comp. | HS Flash Synch at -1 Exp. Comp.

Ghost Crabs are common on the beach. You will have to photograph them at their level for impact so see the Shooting Techniques guide for more details. Photographed between **PL4** and **PL5**.

Snowy Egret, 9/25/05
Canon 1D Mark II, Canon 500mm f/4 IS with 2x TC
1/800 sec, f/10, Av - Evaluative, Exp comp: 0, ISO: 400, Flash exp comp: -3

The Snowy Egret in heavy surf above was never something I thought I would see. He would dart out of the water each time a big wave came in and then chase the beached fish back into the water. On some occasions, a big wave would get him. To make this image I got in the surf as well and risked getting the equipment wet.

Dragonflies are common visitors to the seashore and can be found in the dunes areas.

Willet | Canaveral National Seashore - Merritt Island, FL | 8/14/05 | 52% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | NSN Skimmer w/Wimberley Head
1/640 | f/11 | +1/3 Eval. Comp. | ISO 1000

Above is a Willet silhouette that originally had a lot of detail in the bird, In post processing I brought down the bird's colors to produce a more pleasing effect.

On the following two pages are samples of the wave abstracts I create at the seashore. Currently, I am experimenting with two techniques. The first is photographing the waves rushing onto the shore in the pre-dawn at slow shutter speeds handholding the camera. My favorite lens for this is the Canon 300mm f/2.8 IS but I also use the Canon 28-135mm IS. I will also vary from a small aperture to get depth of field to a large aperture to minimize it. ISO is 800 and I will shoot in evaluative metering, Av mode +1. *Wave Abstract 1* demonstrates this technique. In *Wave Abstract 3,* I liked the shallow tidal ponds on the beach and chose to go to a small aperture for better DOF. Photographing handheld, I framed different scenes. During editing, I found I did not like any of them except this one, which I really love. I will try this again at low tide.

Wave Abstract 2 demonstrates my second technique of photographing in late morning the intense reflection of the sun on the waves using a tripod and long lens (600mm) and panning with the wave as it breaks. I find that I vary the shutter speed from 1/2 to 1/20 of a second using Av mode. I alternate between Av and Tv and because of the changing reflective values as the wave breaks, exposure compensation yields

unpredictable results as does trying to use manual settings. It is a crapshoot getting an image and I delete 100's of bad ones. Its fun and when it works, it's great. I am still trying to find settings that yield predictable results but that may just not be possible with the dynamic, varying light aspects of the wave's movement.

For images like those in *Wave Abstract 1*, I am looking for a pleasing pattern in the viewfinder as the wave recedes back into the water. I am not just photographing willy-nilly but trying to compose a pleasing image.

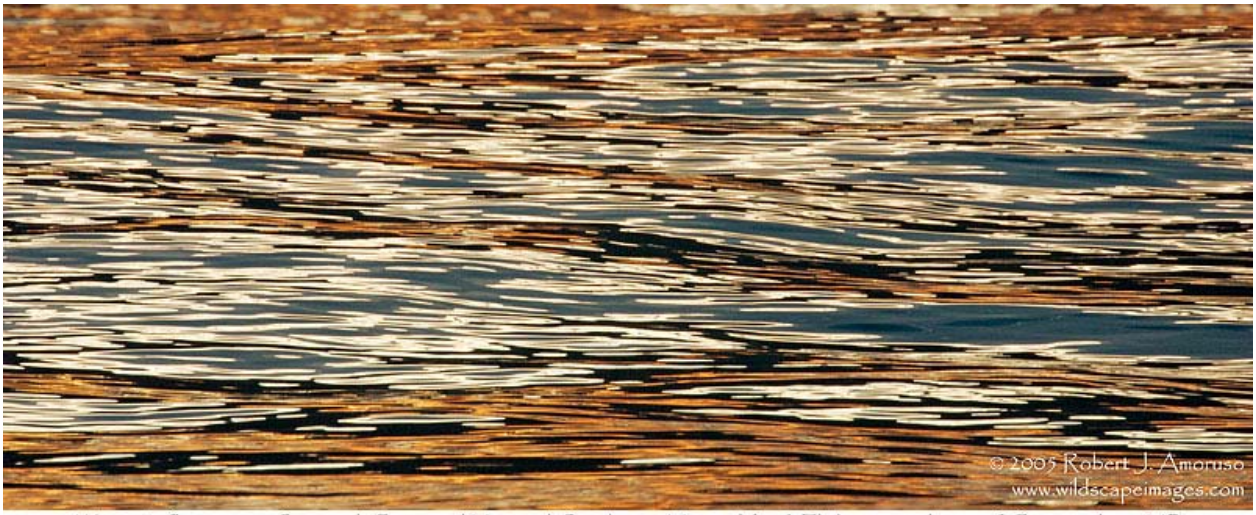
Wave Abstract 2 is a bit harder as the breaking wave leaves little time to compose. Therefore, besides the problem with exposure, composition is problematic. If you try these, expect to delete a bunch of images.

If you were to ask me what delineates a good image from a bad one, I would not be able to tell you. When I see that good image during editing, I know it. It is subjective. The feeling and emotion in an image may make it a success.

Wave Abstract 1, 10/22/06
Canon EOS 5D, EF300mm f/2.8L IS USM
1.3 sec, f/6.3, Mode: Av, Metering: Evaluative, Exp comp: +1, ISO: 800, Handheld

Wave Abstract 2, 7/15/06
Canon EOS 5D, EF600mm f/4L IS USM +1.4x
1/6 sec, f/7.1, Mode: Av, Metering: Evaluative, ISO: 50

Wave Abstract 3, 10/22/06
EOS 5D, 28-135mm IS @ 65mm
0.8 sec, f/20, Mode: Av, Metering: Evaluative, Exp comp: +1, ISO: 800, Handheld



Water Reflections at Sunrise | Canaveral National Seashore - Merritt Island, FL | 8/6/05 | 60% of Capture | 8.2 MP
Canon 1DM2 | Canon 500mm f/4 IS | 2x TC | 1/500 | f/18 | Evaluative | ISO 500

Ocean Reflections 1, 8/6/05

Another abstract that I experiment with are ocean reflections like that above. Under certain conditions, the sunrise reflections on the water present the photographer with varying patterns of gold and yellows, blues and grays, and other combinations. Other times, the water reflects the predominate color of the sun in gold, orange or yellow like that shown in Brown Pelicans at Sunrise.

When I see the multitude of patterns like that above, I will stop down the aperture to a small f/stop to gain Depth of Field and isolate a part of the scene using a long telephoto lens. In the final image, I will crop that into a panoramic image to maintain a reasonable level of sharpness from foreground (FG) to background (BG) using that portion of the image that is sharp. In the image above, the FG is a bit soft. When I captured this, I used 45-point AF on the EOS 1 camera. Subsequently I have started to use a bottom central sensor, focus on that portion of the water I like the pattern in and photograph making the FG sharp. You could also use hyper-focal distance (1/3 in front of point of focus & 2/3 behind point of focus will be reasonably sharp) to chose a focusing point. With a long lens, you will still not have FG to BG sharpness for the full height of the image hence the crop into a panoramic.

On the next page are two avianscape images at sunrise of Brown Pelicans. The image at the bottom of the page produced a neat looking graduation of colors around the sun that I liked so I left it as is.

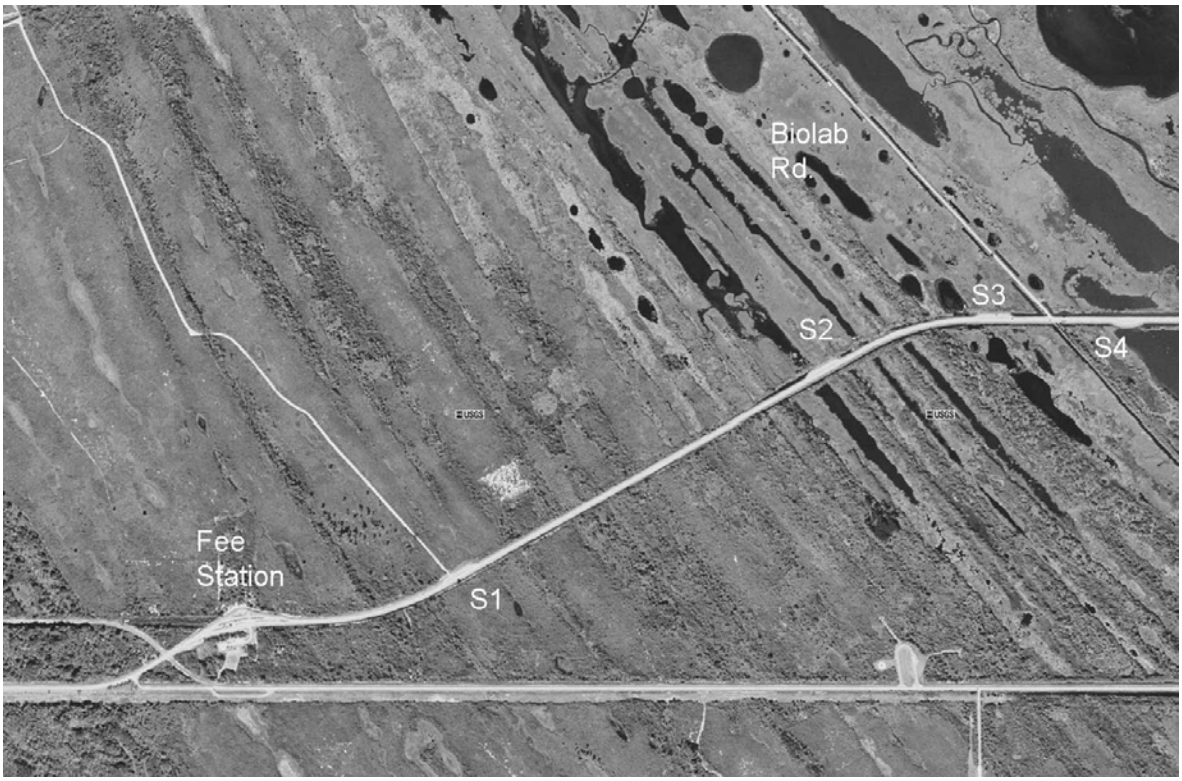
The final image below called *Brown Pelicans – Morning Cloud Bank* and similar images made during this special morning at the seashore are among my favorites from CANA. It was relatively clear and then this thick fog/cloud bankrolled in darkening the sky to an almost twilight condition. Here, I panned with the Pelicans and captured the image as they entered the path of the sun's rays.

Brown Pelicans at Sunrise, 8/12/06
EOS 5D, Canon 600mm f/4 IS
1/8000 sec, f/10, Mode: Av, Metering: Evaluative, Exp comp: +1, ISO: 400

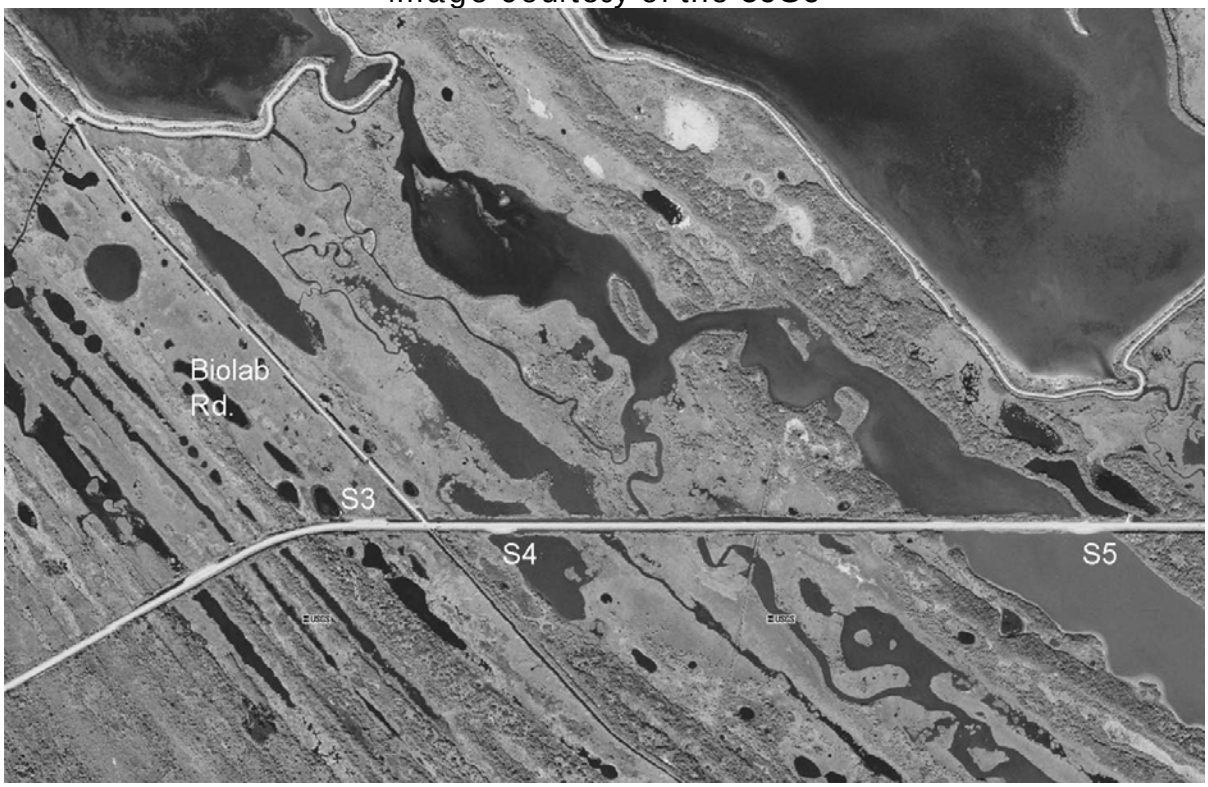
Brown Pelican at Sunrise, 8/12/06
EOS 5D, Canon 600mm f/4 IS
1/2000 sec, f/18, Mode: Av, Metering: Evaluative, ISO: 400

Brown Pelicans – Morning Cloud Bank, 9/2/06
EOS 5D, Canon 70-200mm F/2.8 IS with 2x TC @ 140mm
1/8000 sec, f/14, Av - Evaluative, Exp comp: -2, ISO: 400

Maps from Canaveral National Seashore



"Image courtesy of the USGS"



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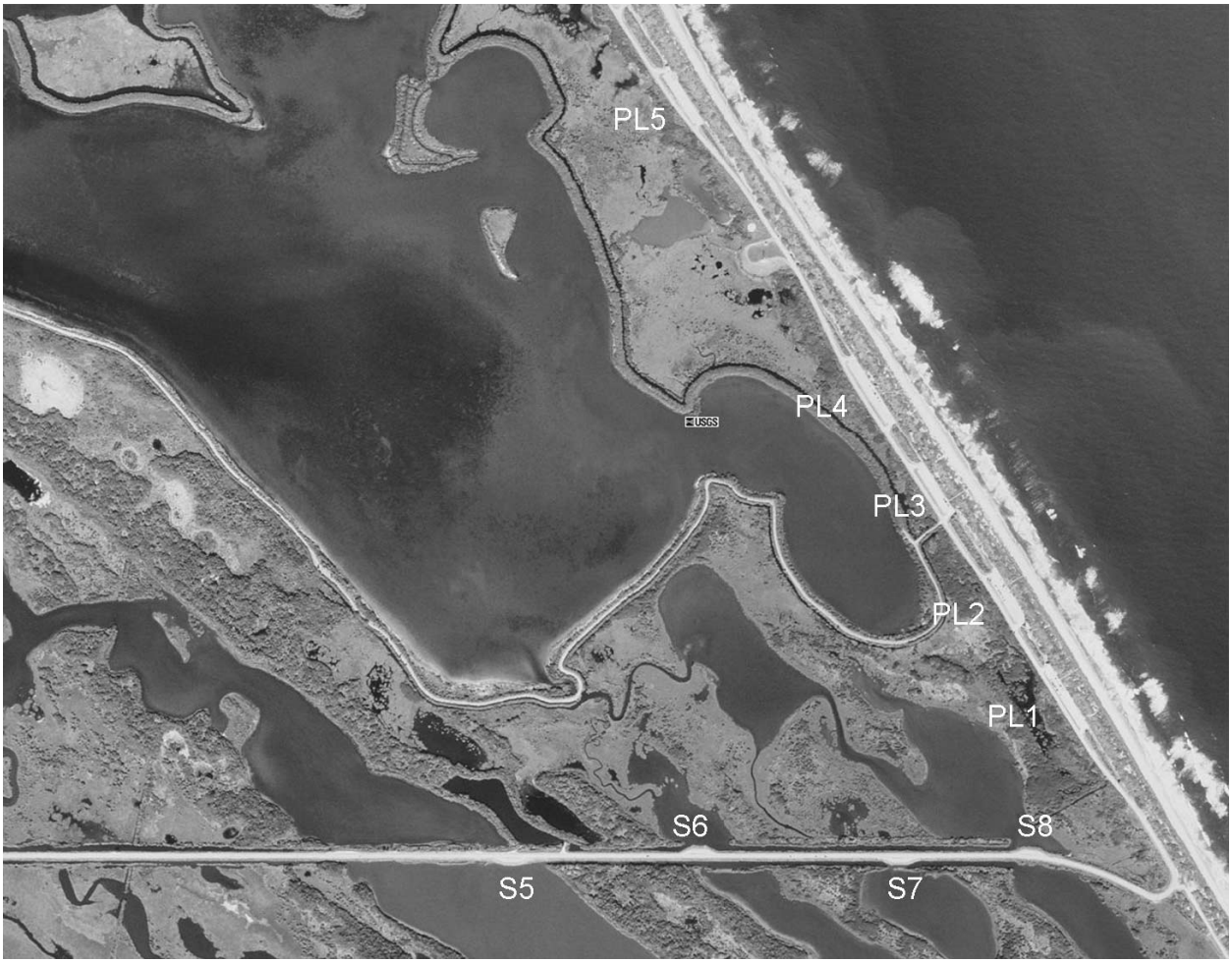

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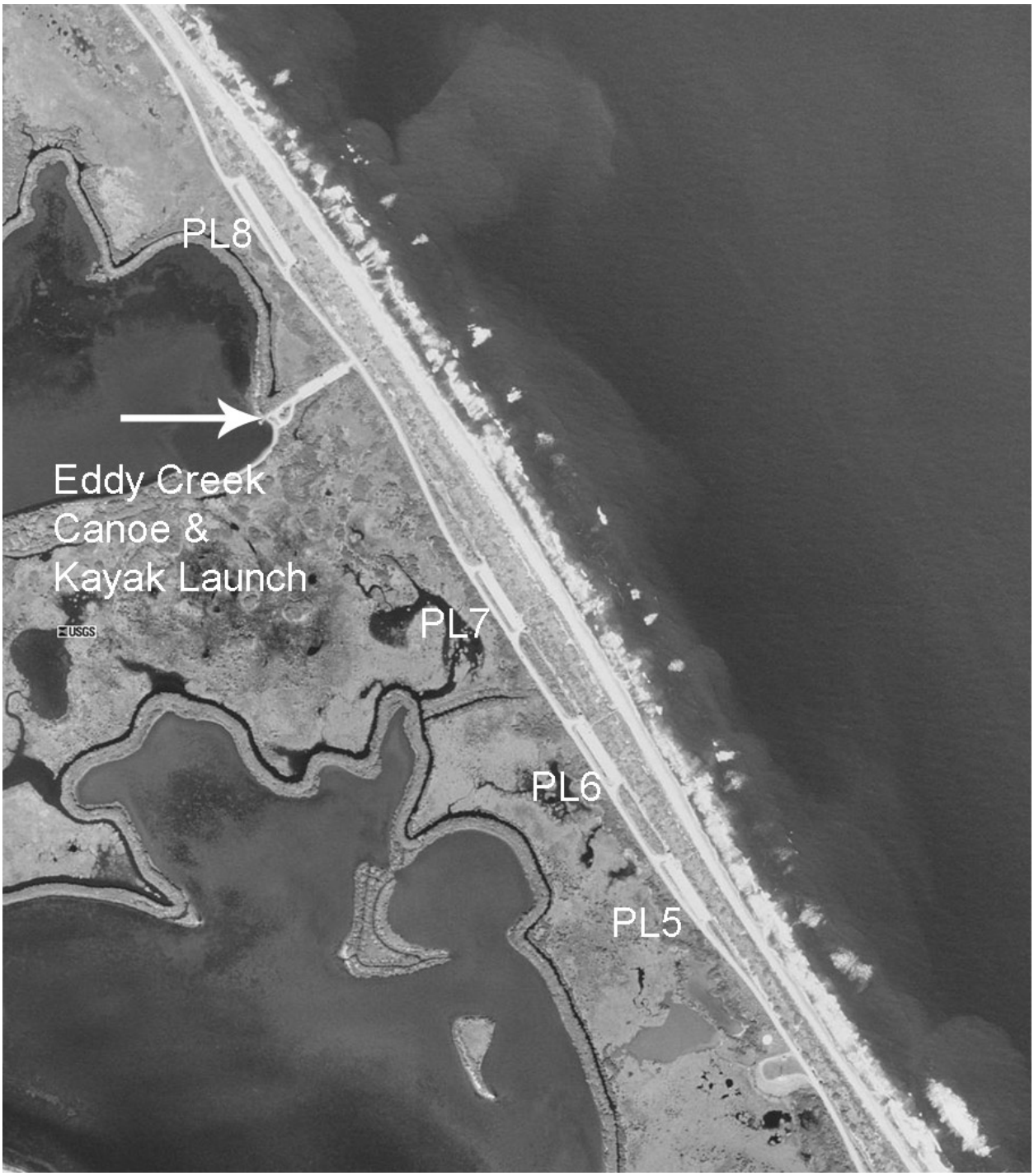

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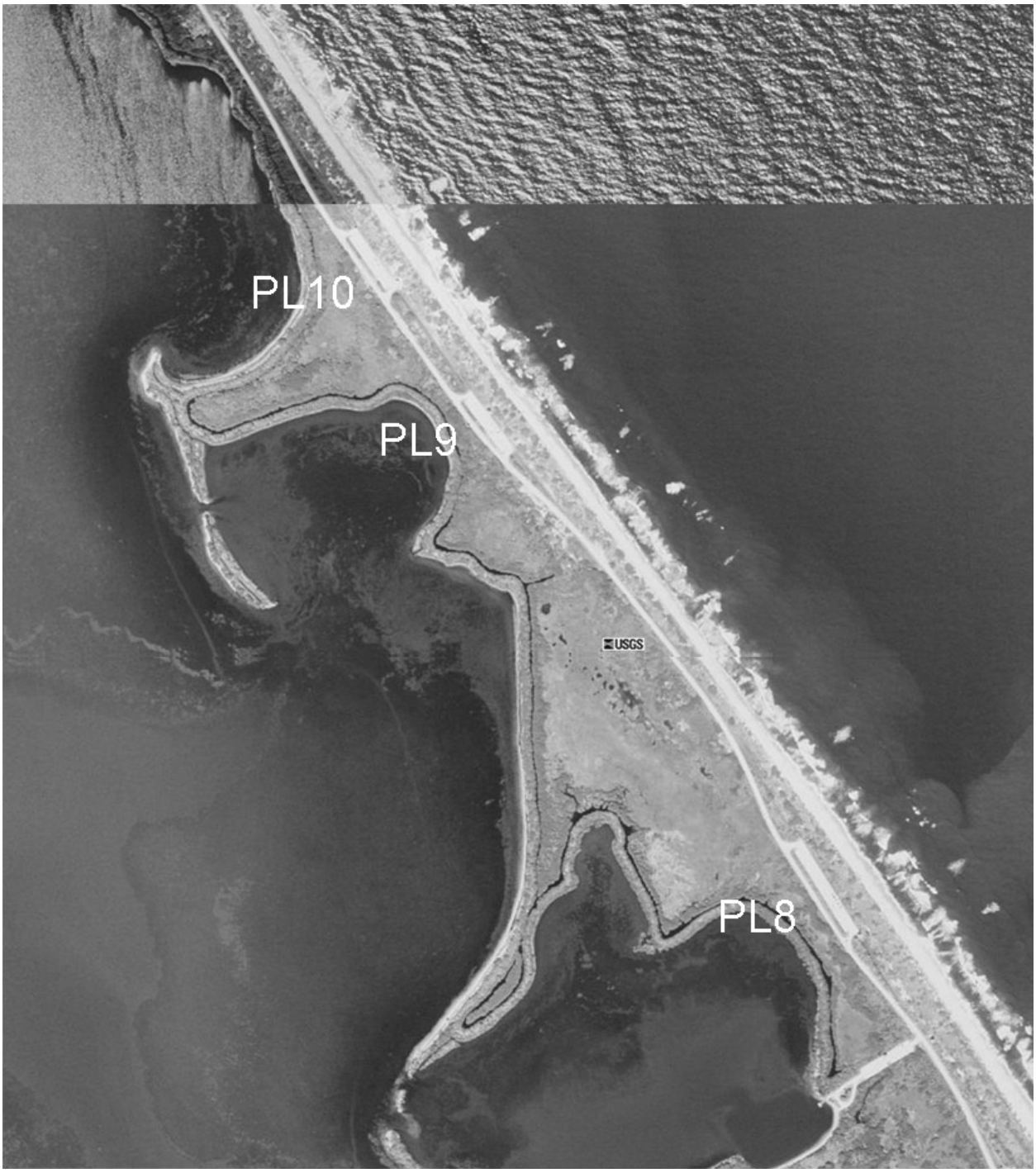
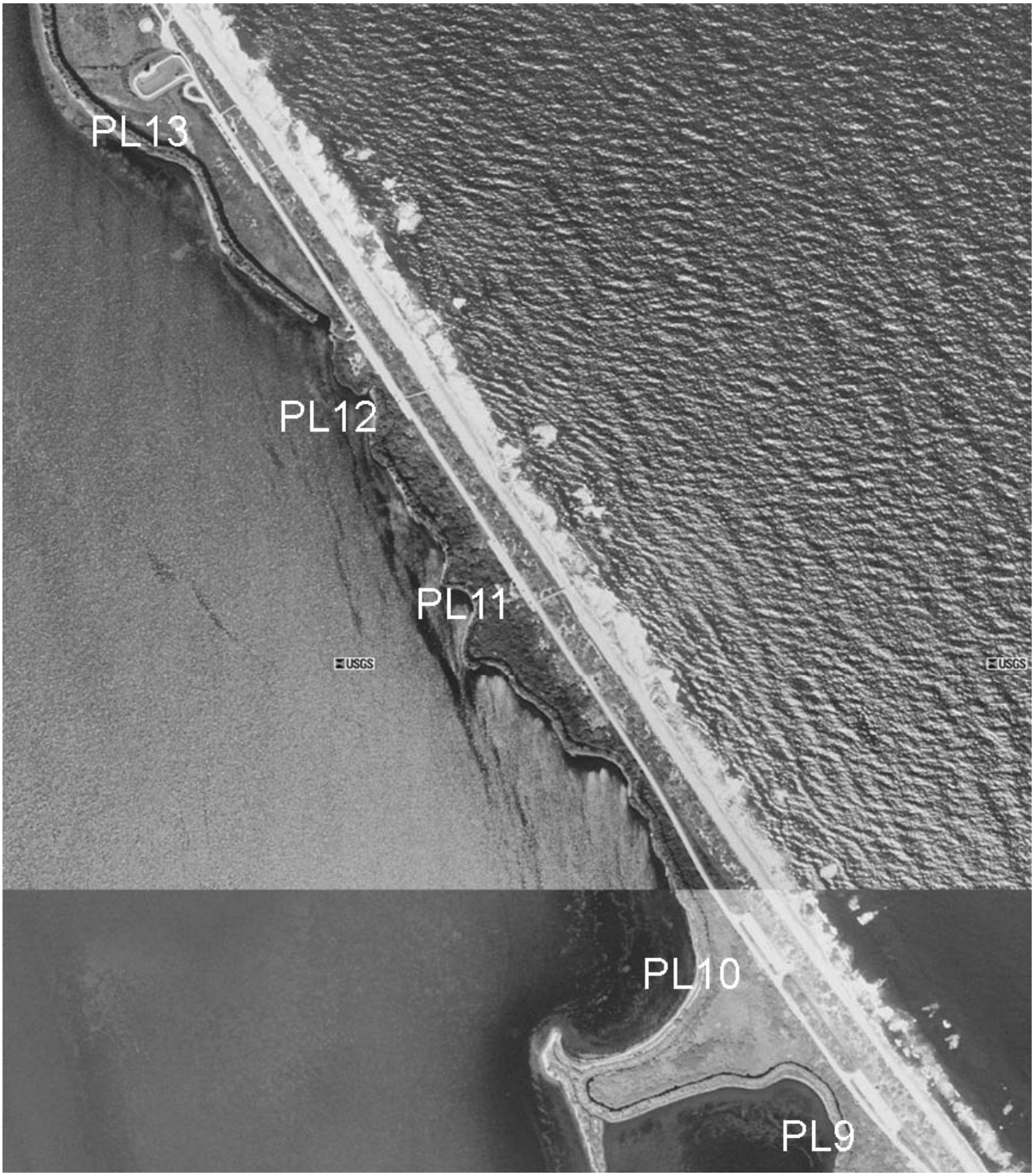


"Image courtesy of the USGS"



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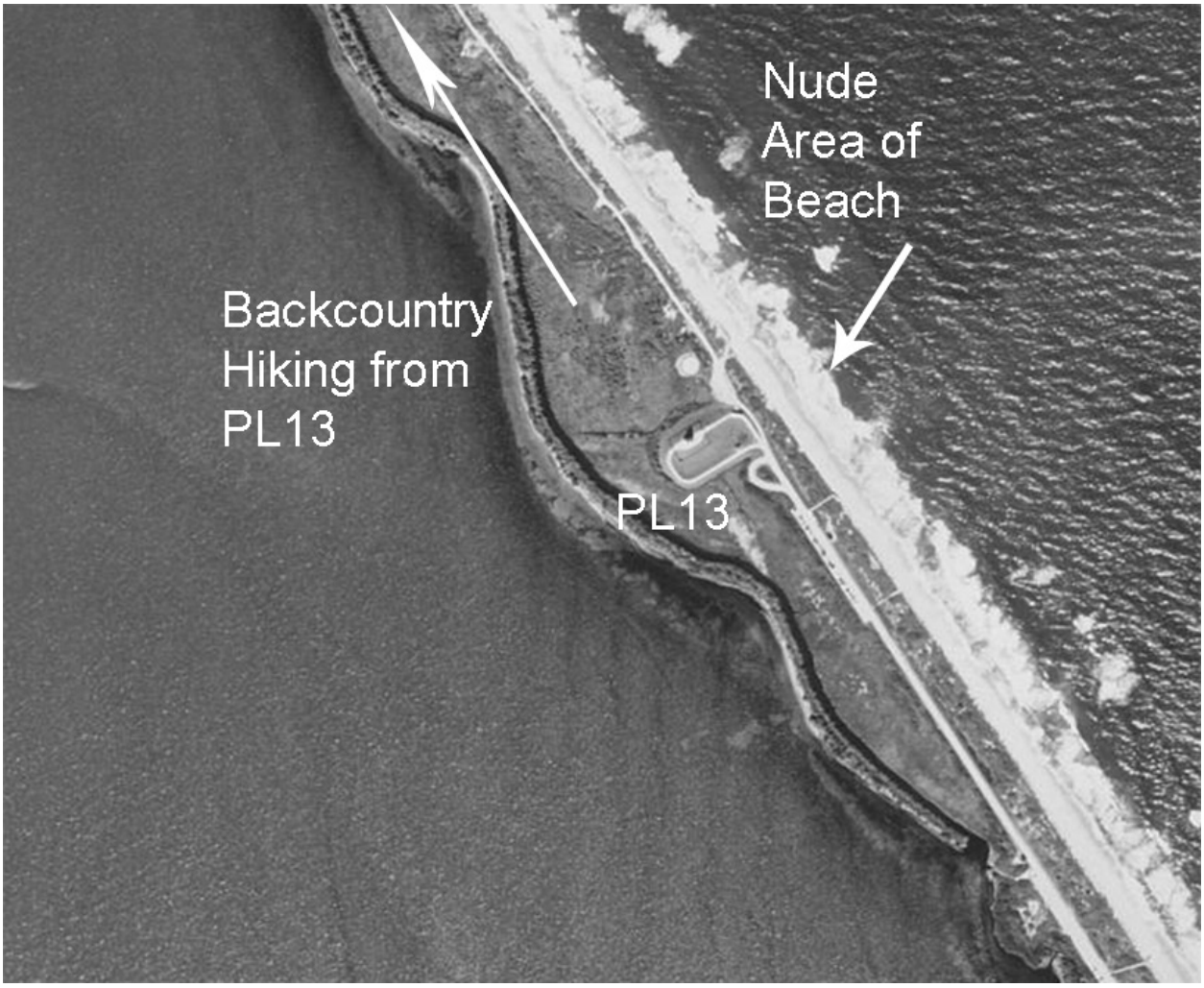

"Image courtesy of the USGS"

A BIRDS AS ART - Wildscape Images
Photographer's Site Guide

Shooting Techniques

Release 3.0
April 11, 2007

By: Robert J. Amoruso, Wildscape Images
With special excerpt from Arthur Morris'
The Art of Bird Photography II

Robert Amoruso getting down and dirty, Sanibel, FL

Techniques

Specific techniques that you may want to use while shooting at areas discussed in the photographer site guide include:

- Intentional blurs.
- Shooting low.
- Shooting from your vehicle.
- Long lens technique.
- Leveling the camera and/or sensor plane.
- Advanced Compositional Techniques (a special excerpt from Arthur Morris' *The Art of Bird Photography II*).

Intentional Blurs

An intentional blur is blurring of a moving subject by intentionally using a slow shutter speed to impart motion. Blurs may be created in both low light and daylight. However, in daylight the resulting aperture setting may be so small (f/22, etc.) that sensor dust, if you are using a DSLR, is quite evident. I will discuss some ways to get around that in a minute.

In low light conditions such as pre-dawn, a low shutter speed may be your only option to create images until the sun comes up. You could use a high ISO such as 3200 but I generally find those images too noisy to be pleasing so I opt for intentional blurs using the following settings.

1. AE Exposure

    a. Use a shutter speed from 1/8 to 1/15 second.
    b. Set the camera to shutter-priority.
    c. If the background is foliage or ground, I usually start out with zero or +1/3 exposure compensation. If the background is white sky, I will use +1-1/2 to +2 exposure compensation. If the background is gray sky, start with +1 exposure compensation.
    d. Set ISO to yield an aperture of, say, f/5.6. Try to maintain an ISO at or lower than 1000 so noise is acceptable.
    e. How you vary your aperture and ISO is really at your discretion based on personal preferences as they relate to noise (high ISO) and aperture (lens performance and depth of field).

2. Manual Exposure

    a. Use a shutter speed from 1/8 to 1/15 second.
    b. Set the camera to manual.
    c. If the background is foliage or ground I usually start out with zero or +1/3 exposure compensation. If the background is white sky, I will use +1-1/2 to

d. You may have noticed that my exposure recommendations are the same for AE vs. Manual Mode. The amount of correction the camera's evaluative meter needs don't change. What does change is how you set it.
    i. Meter off the ground or sky and adjust the settings to provide more light as suggested above.
    ii. In manual you still are using the camera's built in evaluative meter to adjust the shutter speed, aperture and ISO.
    iii. You can take a reading off the sky and using the camera's "Exposure Compensation Scale" along the bottom or side of the viewfinder set the shutter speed, aperture and ISO so that you obtain a +1 to +2 exposure compensation.
    iv. Similarly, for a dark colored background adjust settings so that the scale reads no compensation to +1/3 exposure compensation as needed.
e. Set ISO to yield an aperture of, say, f/5.6. Try to maintain an ISO at or lower than 1000 so noise is acceptable.

If using automatic exposure, I will use Shutter Priority (TV mode in Canon) when creating blurs. If I am going to be panning from dark background to light background, I will set the exposure compensation to +1 as a compromise though it is best to pick either dark or light background and set exposure compensation for that instance and than photograph for those conditions. Your other option here is to use manual so that the exposure settings are not changing as you pan with the bird(s). When using manual, panning from a light to dark to light background will not affect the exposure as you will have set the correct exposure and do not have to worry about the influence the background would have on an automatic exposure (Av, Tv, etc.)

Another option you have and I recommend that you use is flash and the Better Beamer which is available from BIRDS AS ART. The "beamer" will increase the distance your flash illuminates to (i.e., higher Guide Number). Normally I have the flash set-up as follows.

1. AE Exposure

    a. Set the flash to ETTL-II mode, which is the Automatic mode for Canon.
    b. Set the flash exposure compensation at the following:
        i. Dark bird such as an Anhinga, +1 exp. comp.
        ii. Middle toned bird such as Sandhill Crane, 0 exp. comp.
        iii. White bird such as Great Egret, -1 exp. comp.
    c. These are starting points to experiment with so try a few test shots to see what the results will be.
    d. The white bird reflects more light so you need less flash. The dark bird reflects less light so you need more flash.

2. Manual Exposure

    a. Set the flash to Manual mode.
    b. Set the ambient to flash ratio at 1:1 (full flash). This will probably be too much, but try it out and see.
    c. This is a starting point to experiment with so try a few test shots of the birds when they are on the ground to see what the results will be for both dark birds and white birds and adjust accordingly.
        i. For white birds, you may have to back off a 1:1 the setting. Try 1:4 too start.
        ii. For dark birds, you will probably be able to shoot at the 1:1 setting.

If all this exposure talk is Latin to you, I suggest that you purchase Arthur Morris' *The Art of Bird Photography* and *The Art of Bird Photography II*. Both are available from Artie at www.birdsasart.com. The first book is paperback and Artie will send you a signed copy. The second book is available as in Adobe Acrobat Portable Document Format (PDF) on a CDROM. Coming in at 937 pages, when combined with the first book, you will have the "Tour de Force" on how to photograph birds.

Any time of the day is acceptable for creating intentional blurs. However, when creating them in daylight conditions and even at the camera's lowest ISO (usually 50 or 100), you will be using f/stops in the f/22, f/32 and even smaller range. Remember that you are setting your shutter speeds low to produce a motion blur.

If your sensor is not perfectly clean; and it probably is not; you will have sensor dust spots on the final capture. This translates into more time in Photoshop removing them.

The solution is Neutral Density or ND Filters. These filters are color independent whose sole purpose is to reduce the amount of light reaching the frame. For the Canon lenses with drop-in 52mm filter holders, you would need to purchase a threaded holder and the ND filters. I generally use 3-stop and 6-stop ND Filters. I also have a 9-stop filter that I use for my mid-day wave abstracts (see the Canaveral National Seashore Site Guide). With the wave abstracts, the bright sun on the waves is so intense, that even at 9 stops you can see it. When you put a ND filter on a camera, the viewfinder will be dimmer. I have each filter in its own drop-in holder ready to go. However, for 90% of your blurs the 3-stop ND filter and one drop-in holder is all you need. If you are using a lens with a front element screw mount, purchase the appropriate size filter for that.

Arthur Morris checking histogram, Sanibel Fishing Pier, Sanibel, FL
Image courtesy of and copyright 2007: Robert Amoruso

The blur of the Coots below from Viera Wetlands is not strictly a pan blur (if you panned with the flying/running coots that would be a pan blur); it demonstrates that blur images do not have to be panned.

Here I used an ambient light exposure compensation of +2/3 because of the brightness on the water and a flash exposure compensation of -1 2/3. I also upped the shutter speed to 1/100 of a second to provide relative sharpness to the Coots not flying and to impart motion in the wings and forward acceleration of those blasting off.

Coots, 2/7/06
Canon 1D MKIIn w/500mm,
1/100 sec, f/4, Mode: Av, Metering: Evaluative, ISO: 800
Exposure comp: +2/3, Flash exp comp: -1 2/3

Shooting Low

By getting low, you change your perspective of the subject and create a more dynamic "eye-level" view. To get low to the subject, you want to lower the overall elevation of the camera/lens as it relates to your subject. You do this by lowering your tripod's legs, extending the legs of the tripod out perpendicular to the camera/lens or by using a ground pod device.

1. Lowering the tripod's legs.
    a. Just about any tripod will allow you to lower its legs.
    b. With most tripods, you can shorten the leg extensions to lower it. Beware that if the legs do not allow you to span them out from the center, the tripod will become unstable.
    c. Gitzo tripods, and I am sure many others, also allow you to span the legs out at angles greater than the default full height stance. If you wondering what I mean here, I am referring to opening the legs up so that the tripod will stand erect.

2. Extending (spanning) the legs out perpendicular to the camera/lens axis.
    a. Many Gitzo and other tripods have a release at the head of the tripod to allow the legs to swing out to two or more additional positions.
    b. When you do this, you will generally combine it with shortening the legs. Remember that if you collapse the tripod to the ground by spanning the legs out, you are placing the legs in bending which increases the stress in the leg and could cause it to break (problem with carbon fiber).

3. Ground pods.

Many popular ground pods that support the camera/lens at the tripod collar's lens plate are available and include the Walt Anderson Panning Ground Pod pictured at right with a Canon 500mm lens sold by BIRDS AS ART.

© Arthur Morris

4. Bean bags are another option (see shooting from vehicle).

Robert Amoruso Shooting Low on Tripod, © Cynthia Amoruso

Note that I am shooting with stacked teleconverters (a 1.4x and 2x). The EOS 1 cameras will focus, albeit grudgingly with this combination. Here I am relaxing my left arm but I will have that arm tight around the Wimberley Head, pulling down on the front of the lens when shooting. I counterbalance that by pulling down on the camera. This dampens the camera shake. Hold your breath and release the shutter. See Long Lens Technique for more details.

Robert Amoruso getting down and dirty, Sanibel, FL
Image Copyright 2007: Arthur Morris BIRDS AS ART

This image of me above was taken by Artie during the December 2006 Southwest Florida IPT. I have my 600mm lens and camera mounted on a ground pod

I placed myself at the water's edge and collapsed the tripod legs to the second lowest setting, leveled the sensor plane and created the image below. Lowering my camera, I changed the perspective of the image by getting eye-to-eye with the gator.

Alligator, 8/26/06, Canon 1Ds Mark II and 600mm f/4 IS w/2xTC
1/400 sec, f/8, Mode: Manual, Meeting: Evaluative, ISO: 400

Shooting From Your Vehicle

Many birds are approachable on foot if you do it slowly. Ducks are skittish and at Viera, MINWR and other locations, I will first photograph from the car before I decide to try an approach on foot.

I recommend two devices for shooting from your vehicle, a bean bag or a window-pod. I use the following:


© Arthur Morris

1. The BIRDS AS ART Big Lens Ultimate Bean Bag (BLUBB) shown at right (http://www.birdsasart.com/blubb.htm). This **IS** the ultimate bean bag and I highly recommend it. Consider combining it with the Walt Anderson Panning Ground Pod available from BIRDS AS ART. By placing the ground pod on the bean bag, you can pan the lens. It also allows me to have my Wimberley flash bracket attached to my lens plate without it hitting the bean bag causing the camera to list to the side. Forget the others; this is the bean bag to buy.

2. A window-mount support. If I am going to be shooting for a while in the same location or driving a short distance, I'll use the window mount so I don't have to hold the camera on the bean bag for long periods.

Amoruso's BLUBB in Action, © 2006 Cynthia Amoruso

Amoruso's BLUBB in Action – Up Close, © 2006 Cynthia Amoruso

Amoruso's Window Mount Set-Up, © 2006 Cynthia Amoruso

Amoruso's Window Mount Set-Up, © 2006 Cynthia Amoruso

Long Lens Technique

- USE A TRIPOD.

  Chose a tripod that will handle the weight of the equipment you are using. Also, think ahead and step-up to a tripod now that may exceed your immediate needs but will allow you to use a 500mm or 600mm if you purchase one in the future.

  Carbon fiber tripods are sturdy and lightweight but carry a premium price when compared to an equivalent aluminum tripod. However, they are easier to carry and will last longer when used in water.

- USE A TRIPOD HEAD THAT MEETS YOUR NEEDS

  Wimberley Tripod heads, which I use, are Gimbal mount heads that allow you to balance a camera with a long lens effortlessly and don't have to be "locked-down" when you're not holding it (you do have to balance the lens when you first attach it – not a big deal).

Ball heads include the Arca Swiss B1 and the Really Right Stuff BH-55 Ballhead to name two popular models. I now use the RRS BH-55, which has received many great reviews.

A ball head may meet the weight requirements, but if you don't lock it down, the lens will flop over. That's why most nature photographers, especially those shooting birds use some type of gimbal design such as the Wimberley.

- IMAGE STABILIZATION (IS)

  If the lens you are using is a Canon and it has Image Stabilization (IS) [Vibration Reduction (VR) for Nikon] - use it! Be warned that not all IS/VR lenses are tripod compatible. Check to be sure first. For Canon lenses, the following lenses CAN be used on a tripod. Set the IS Mode to "2" when them on a tripod.
  - EF 300 mm f/2.8 USM L IS
  - EF 400 mm f/2.8 USM L IS
  - EF 400 mm f/4 USM DO IS
  - EF 500 mm f/4 USM L IS
  - EF 600 mm f/4 USM L IS
  - EF 70-200 mm f/2.8 USM L IS
  - EF 28-300/3.5-5.6 L IS
  - EF 70-300/4.5-5.6 DO IS

- TIGHTEN DOWN

  Unless you are photographing flight, tighten down the knobs. The added tension will help to dampen movement and will help you to "cinch-up" the rig as discussed below.

- CINCH-IT-UP

  Use you your body to dampen the movement of the camera and lenses. Though you might think the mirror lock-up and a remote trigger would be better, it is not.

  First, place you left arm over the top of the lens (see images in this section). When I am using the Wimberley Head, I will lock the crook of my arm into the vertical portion of the head. I then apply some downward pressure. Grasping the camera in the right hand, press down on the camera body to balance the downwards load on the front of the camera. Place your eye snugly up against the eyecup, hold your breath and release the shutter gently.

  Be careful not to manually change the focus with that left hand on top of the lens. When I have students in the field, I advise them to orient the Wimberley so that the controls are on the left side of the camera. This places the vertical column of the head to the left allowing you to cinch in the crook of your arm around that column. This also keeps your right hand free to manipulate the camera controls and shutter.

The images below were created with a 600mm f/4 IS Canon telephoto lens with stacked 2x and 1.4x teleconverters. Even with this combination, Canon EOS-1 cameras will focus grudgingly and using good long-lens technical as discussed above, sharp images are possible. Getting low also helps to heighten the impact of the images. In this case, I was seated on the bank at the edge of the water.

Black-necked Stilt with two chicks (one is under the wing), 6/11/06
Canon 1D Mark II n and 600mm f/4 IS w/2xTC + 1.4xTC
1/400 sec, f/8, Mode: Manual, Metering: Evaluative, ISO: 400

Black-necked Stilt on remaining egg, 6/11/06
Canon 1D Mark II n and 600mm f/4 IS w/2xTC + 1.4xTC
1/500 sec, f/8, Mode: AV, Meeting: Evaluative -2/3, ISO: 400

Black-necked Stilt chick, 6/11/06
Canon 1D Mark II n and 600mm f/4 IS w/2xTC + 1.4xTC
1/250 sec, f/8, Mode: Manual, Meeting: Evaluative, ISO: 800

Leveling the Camera or Sensor Plane

If your tripod has a leveling bubble, use it. If not you can purchase a leveling bubble that attaches to the hot shoe of the camera from www.birdsasart.com. Another option to level the camera if you are using the Gitzo tripods is the G1321 Leveling Base. It will fit the 1325 and 1548 and other tripod sizes. Make sure it fits your tripod before you buy one.

Leveling the camera with the G1321 is a 5-second affair. It has a built-in leveling bubble. You loosen it using a vertical shaft that extends 6" below the base of the head. You then tilt the head around until the bubble indicates it's level. Tighten the shaft and you're done; no more fussing with the leg extensions. The base has a 20-degree adjustment tolerance so the tripod needs to be relatively level to begin with.

If you are using a tripod and a camera with a lens collar, a static image can be leveled by rotating the lens in the collar. Use a hot shoe mounted level to aid you. Alternatively, you can use an even line of sensors in the camera's viewfinder to level the camera by site looking through the viewfinder and aligning the AF sensors with the horizon.

Advanced Compositional Techniques

The following is written and copyrighted 2003 by Arthur Morris, BIRDS AS ART (taken from BAA Bulletin No. 123 at http://www.birdsasart.com/bn123.htm)

Understanding Light-Angle, Subject-to-Film Plane Orientation, and Head-Angle

At this point you may be thinking, "This guy is nuts: how can he offer us an entire chapter comprised of only 2203 words of text?" The answer is a simple one: the failure to understand the importance of how light-angle and head-angle relate to both Subject-to-Film-Plane orientation and to the quality of the final image ruins more bird photographs than all other artistic and design factors combined. I'd say that at least three-quarters of the images of birds presented for critiquing on BIRDS AS ART Instructional Photo-Tour critiquing sessions or on the various Internet nature photography sites suffer from improper light angle, improper head-angle, or both. As you approach a bird or a flock of birds, your primary consideration in nearly all cases will be Light-Angle, so that is where we shall begin.

Light-Angle

I am a huge (one could say obsessed) fan of direct frontal lighting. And surely all IPT participants would tell you that I am—among all natural history photography instructors—its biggest proponent. Except when creating silhouettes or working in other backlit situations, *I want my shadow pointed directly at the bird in almost all cases*. I simply do not like many side-lit images of birds—expose for the highlight side and the shadowed side loses all detail. The concept is a simple one. I want the bird in front of me with the sun coming right over the top of my head. It bears repeating: I want my shadow pointed right at the subject. (In low light situations, you almost never want to have your shadow fall either partially or completely *upon* the subject. In these instances, work off-angle to the light just enough so that your shadow does not appear anywhere in the image.) Ideally, connecting the dots between the light source (the sun), the photographer, and the subject will yield a straight line. With birds, and many other natural history subjects as well, utilizing this direct frontal lighting will yield images of subjects that are evenly and pleasingly lit. There will be no shadows cast by parts of the bird falling on the bird itself...

Realize also that when making backlit or silhouetted images, the most dramatic results will be possible when the subject is on the line drawn between the photographer and the light source; in other words, you need to position yourself so that the subject is precisely between you and the sun.

Subject-to-Film Plane Orientation

The subject-to-film-plane orientation is an important consideration in the basic design of an image. In many of the images that I make—especially those stationary birds, I usually strive to position myself so that the bird is either parallel to—or roughly parallel to—the film plane. The resulting "side" or "field guide" portrait reveals much of a bird's

beauty and since you are seeing exactly one-half of the bird, images of this type hide nothing. This parallel-to-the-film-plane orientation is an especially attractive choice when working in horizontal format.

While photographing birds when their flight path is exactly parallel to the film plane, the nicest images almost always feature the bird with its wings in the full upstroke or the full downstroke position. If someone tells you that capturing such images is a matter of skill and they are using a digital camera, see if you can entice them to place a series of wagers with you… You will clean them out in short order. At one time, I thought that it was possible to determine wing position by timing the release of the shutter, but once I switched to digital I learned that I was badly mistaken. I would think, "Got that one with its wings up," only to see that the image had been made while the bird's wings were in the full downstroke position… The best way to ensure making a few images that feature ideal wing position is to use a camera with a fast frame rate and, once the bird enters the ideal image-making zone, keep the hammer down, that is, depress the shutter button until the bird is past your position or until you are no longer able to maintain autofocus. Images made from the side with the bird's wings edge-on to your position pretty much never succeed; you would not want to photograph a pancake from the side!

A second option is to feature a bird that is angled towards the film plane. The bird may be angled just a bit towards you, nearly facing you, or anywhere in between. These types of orientations work well with both horizontal and vertical compositions, and are especially effective when the bird opens its mouth to yawn or to call—the better to look down your throat, my dear! The same can be said in instances where the subject is facing directly at the camera. These types of images, especially when the bird is staring right down the barrel of the lens, can have high emotional impact; avian subjects can—depending on the species or family—look serious, comical, threatening, irritated, puzzled, inquisitive, belligerent, or studious among others. Perhaps it is when birds are looking right at us that they appear most human… Either of the facing forward orientations (angled or direct) works well with flying birds. And if the bird is angled only slightly towards your position, even the wings edge-on position can yield some pleasing compositions.

The most difficult orientation to deal with occurs when a bird is facing directly away from the film plane (and from you). When attempting to pull off these extremely difficult types of images, it is almost always best to work in vertical format and to maximize depth of field as much as possible, the latter because an out-of-focus tail coming right at the viewer will always be a sure image killer. (Note: there are two head-angle options available here.) The traditional approach is to make the image when the bird has its head turned 90 degrees back towards the camera, that is, when the head is parallel to the film plane. A less frequently used strategy here is to create the image when the subject is looking directly away; this may work well when there is a particularly striking pattern on the bird's back or hind neck.

Do understand that in almost all cases, subject-to-film-plane orientation will be determined by wind direction. Unless it is dead calm (or close to it), or your subjects are in a sheltered area, most birds will face directly into the wind. And this holds true not

only for birds in flight, but for birds resting on an open beach, for birds perched in a tree or on a wire, or for birds sitting on a clean perch at your feeding set-up. It is important to understand that the very best light angle/wind direction combination for flight will usually not be best for working a group of roosting terns and skimmers.

Here are the basics.

1- Wind and sun together, that is, from the same direction: ideal for flight, good for birds on the ground or perched.
2- Wind and sun direction roughly 90 degrees from each other, good to very good for flight photography, excellent for stationary subjects; the perfect conditions for making images of birds parallel to the film plane. As a general rule, I will photograph as much as ten to fifteen degrees off of the light angle to ensure that the subject is parallel to the film plane, but will wait until the bird turns its head *back into the light* before making an image.
3- Wind against sun: generally poor for all types of bird photography unless you can find subjects in sheltered areas. (Note: in all difficult conditions, try to allow yourself to think way outside of the box.)

Consider the following scenario. It is 5am on the first morning of a Southwest Florida BIRDS AS ART/Instructional Photo Tour when I meet the car-pooling group in the parking lot to exchange pleasantries. We are headed for one of my favorite spots on the planet, the Venice Rookery. Lots of folks, seeing a clear night sky filled with bright stars, remark that it will surely be a great morning. Noting that a cold front had passed through during the night and feeling a chilly northwest wind on my cheek, I inform them that despite the bright sunny conditions that we will encounter, we will have a difficult morning that will offer very little in the way of good flight photography. "How can you possibly know that?" several ask almost in unison. "It's easy," I respond. "The sun rises in the south/south east. With the wind from the northwest the birds will be flying and landing away from us so that they can land into the wind. And even the birds at the nests will tend to face into the wind (and again, away from the light) as they perform their age-old courtship rituals and feed their chicks. Things will be better this afternoon at our White Pelican spot as the wind will most likely switch to the west. With the sun setting in the south/southwest, the huge, white birds will be flying, landing, and even standing facing into the wind and into the light."

For flight photography, winds from the south or those with an easterly component in the morning are ideal as such conditions will find the birds flying and landing into the wind as you have the sun behind you (with your shadow pointed almost directly at your incoming subjects). Likewise, winds from the south or those with a westerly component will yield excellent conditions for flight photography on sunny afternoons. Strong southeast winds in morning or strong southwest winds in the afternoon are perfect for those wishing to make images of birds braking in flight while coming in with their landing gear down.

Northwest winds in the morning and northeast winds in the afternoons are generally the kiss of death for flight photography, but never give up; try thinking outside of the box while letting your creative vision expand when conditions appear to be bleak. Here are

some of the ways that I have come up with to save the day when the wind against sun combination made things difficult:

1- Utilize direct backlighting to photograph birds in flight or landing. Light shining through the wings of a Snow or Ross' Goose or any of the egrets or terns can be a beautiful thing. Add flash if needed (but remember to be careful when pointing your Better Beamer anywhere near the sun lest you melt a big hole in your flash…)
2- Look for diving groups of Brown Pelicans. While the pelicans will make their approaches into the wind (and thus, away from the light), just before they dive they turn so that when they are in full dive the sun lights their backs directly. I actually prefer these top-shots of diving birds to the images that show the bird's undersides.
3- If the wind is not quite opposite the sun, you may be able to capture a nice over-the-shoulder pose or to make some nice images of banking birds.

Head-Angle

Understanding the importance of the angle of the bird's head relative to both the light-angle and the film plane is crucial to those striving to produce powerful, appealing images on a consistent basis. Images of birds facing slightly or well away from the camera are rarely successful. Ideally, when the *subject* is roughly parallel to the film plane, the *bird's head* should be parallel to the film plane, or—better yet in most cases—just a bit inside of parallel, that is, turned two or three degrees *towards* the film plane. Assuming a perfect light-angle, I actually prefer the latter for several reasons. With the subject's head turned slightly towards the film plane, the tip of the bill will generally be on the same plane as the eye, so even when one is working at wide open apertures the image will appear sharper overall than in an image where the bird's head is precisely parallel to the film plane. Furthermore, when the bird's head is cocked slightly towards you and the sun is directly behind you, the face will be illuminated immaculately and the image will almost always feature a catch-light in the eye.

With birds facing to some degree *towards* the camera, it is usually best to make the photograph either when the bird is looking directly at the camera or when its head is aligned naturally with its body. Having the bird's head parallel to the film plane when the subject's body is angled towards the film plane usually looks a bit unnatural. When the body is angled partially or totally away from the film plane, it is—as noted above--almost imperative that the bird's head be parallel to the film plane. At times, it is possible to get a bird to turn its head towards you by making a sharp raspy "queek" sound (though at times this may scare the subject away). Often it is best to simply wait (and pray) for the bird to turn its head…

About Advanced Compositional Techniques by Robert Amoruso

If you find the advanced compositional techniques above helpful as well as intriguing and I am sure you do, I recommend you purchase Arthur Morris' *The Art of Bird Photography* and *The Art of Bird Photography II*. Both are available from Artie at www.birdsasart.com. The first book is paperback and Artie will send you a signed copy. The second book is available as in Adobe Acrobat Portable Document Format (PDF) on a CDROM.

The excerpt from the book above is just a small sample of all the knowledge, experience and advice that Artie has packed into these books. It is a worthwhile investment.

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Map Reference

1. Annotated map images used in the site guide provided by USGS at http://terraserver.microsoft.com/. From the TerraServer website FAQ: The images are from the U.S. Geological Survey, and are freely available for you to download, use and re-distribute. The TerraServer team and the USGS appreciate credit for their work on this project by displaying the message "Image courtesy of the USGS".

Brevard County Site Location Reports

For regular updates on site conditions in Brevard County as well as other areas I visit, go to my blog at wildscapeimages.blog.com I also publish a newsletter about once a month. To join my email list and receive the newsletter, send me an email at wildscapeimages@adelphia.net.

Wildscape Images Photo Workshops

I conduct Personalized Photographic Instructional Workshops (PPIW) in Central Florida's Brevard and Orange Counties and other areas on request. I can help you find the birds, show you the techniques needed to capture pleasing images of them and tutor you in processing those images. My PPIW's are designed for one to four persons and are personalized to provide close one-on-one instruction. Besides catering to your learning needs, I am sensitive to your physical needs as well. The tours are primarily conducted to locations by vehicle and in most instances little walking is needed. Contact me as follows:

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To Arthur Morris who was and continues to be my teacher and mentor in bird photography and who I also consider a friend. Though I photographed for over thirty years, I only seriously began bird photography in 2003 after attending one of Artie's Titusville Space Coast Birding & Wildlife Festival workshops. Artie brought me further, faster and better than I could have ever imagined. As a co-leader on his BIRDS AS ART Instructional Photo Tours, I continue to learn from him as I help our workshop participants. At the 2007 Titusville Space Coast Birding & Wildlife Festival workshop, I hosted my own workshops. I have come full circle at least in that regard since first starting down this path.

Moreover, to my wife Cynthia for putting up with what has become an obsession. Artie's professionalism causes you to drive yourself to ever-higher accomplishments. That pursuit places many demands on a relationship and Cynthia has been a willing partner in helping me to learn, putting up with my long hours and trips away from home. She also accompanies me on most of my private Florida travel to photograph and it is this shared love of nature that we have always had together that puts the joy into making images. I will always love her.

Robert J. Amoruso, April 2007

Attachment 1 – Miscellaneous Locations

Appendix List

1. Blue Heron Water Reclamation Facility, City of Titusville Wetland Visitation Policies

References

1. Annotated map images used in the site guide provided by USGS at http://terraserver.microsoft.com/. From the TerraServer website FAQ: The images are from the U.S. Geological Survey, and are freely available for you to download, use and re-distribute. The TerraServer team and the USGS appreciate credit for their work on this project by displaying the message "Image courtesy of the USGS".

CITY OF TITUSVILLE, FL
WETLAND VISITATION POLICIES

- The Wetlands will be open to the public from seven to three-thirty Monday-Friday and weekend by appointment.
- All visitors must sign in and check out at the administration building.
- A vehicle pass will be issued upon signing in. This is to be visibly displayed on the vehicle and returned when exiting.
- People who wish to walk or jog the Wetlands will be issued a smaller version of the vehicle pass.
- Visitors will follow the signs through the plant to the Wetlands. Do not stray from this route, as this is an operational facility with many potential hazards.
- Vehicle traffic is limited to the Wetland perimeter berms. All berms are open to foot traffic.
- There is to be no planting, trapping, fishing, hunting, boating, or swimming within the confines of the Wetlands.
- Feeding and/or harassing any form of wildlife is illegal and will not be tolerated. Violators will be turned over to the proper authorities.
- The City of Titusville reserves the right to remove visitors from the Wetlands if necessary.
- On occasion, areas of the Wetlands will be off limits. Do not enter these areas for your personal safety.
- Literature is available for your viewing and safety concerns. If you do not wish to keep the literature, return it upon checking out.
- Please use the comment form at the administration building if you have any concerns, suggestions, or opinions.

The Staff and Management of the Water Reclamation Department wish you a safe and educational visit.

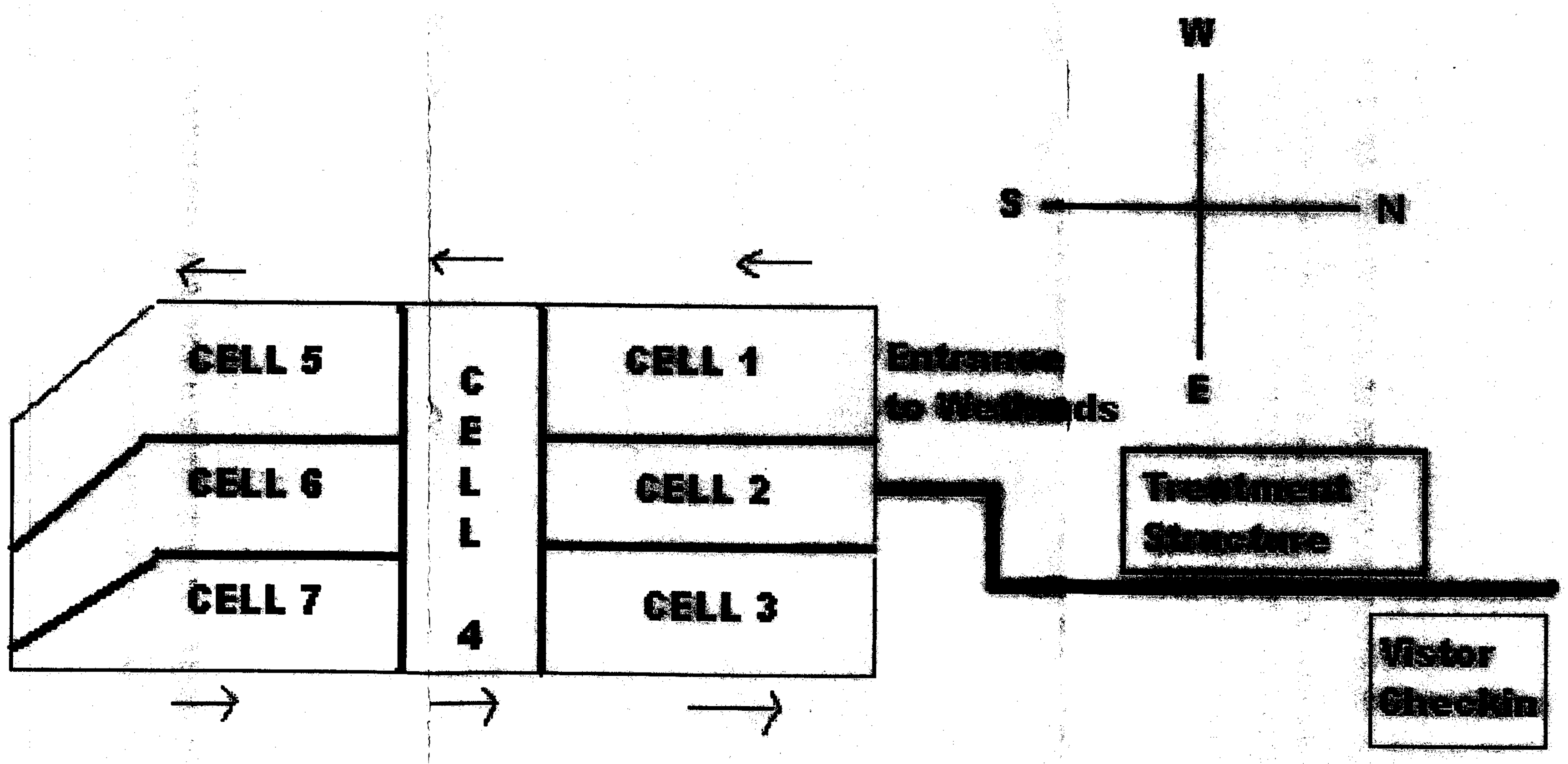
COME BACK AND SEE US AGAIN!

APPENDIX 1

APPENDIX 1

CITY OF TITUSVILLE

BLUE HERON
WETLAND TREATMENT SYSTEM



Attachment 2 – Merritt Island National Wildlife Refuge (MINWR)

Links & Info

US FWS Website for MINWR: http://www.fws.gov/merrittisland

MINWR Ranger Nancy Corona contact at 321-861-0668 or at nancy_corona@fws.gov

Trails & Drive Maps: http://www.fws.gov/merrittisland/Maps-DrivesTrails/index.html

US FWS Southeast Region website:

- Main Website: http://www.fws.gov/southeast/
- Florida Website: http://www.fws.gov/southeast/maps/fl.html
- Planning (CCP Docs): http://www.fws.gov/southeast/planning
- Invasive Species Info: http://www.nwrinvasives.com/refuge_data.asp?org=41570
- Florida Scrub Jays: http://www.fws.gov/northflorida/Species-Accounts/Fla-Scrub-Jay-2005.htm
- Maps of the drives and trails in the Merritt Island National Wildlife Refuge, Steve Davidson, 11/16/06: http://www.fws.gov/merrittisland/Maps-DrivesTrails/

Merritt Island National Wildlife Refuge Visitor Center: State Road 402, Titusville. Visitor information center hours: 8 a.m. to 4:30 p.m. weekdays, 9 a.m. to 5 p.m. Saturdays, except for major federal holidays.

The refuge may be closed up to 3 days before a Space Shuttle launch and 1 day before a Shuttle landing. Call ahead to check

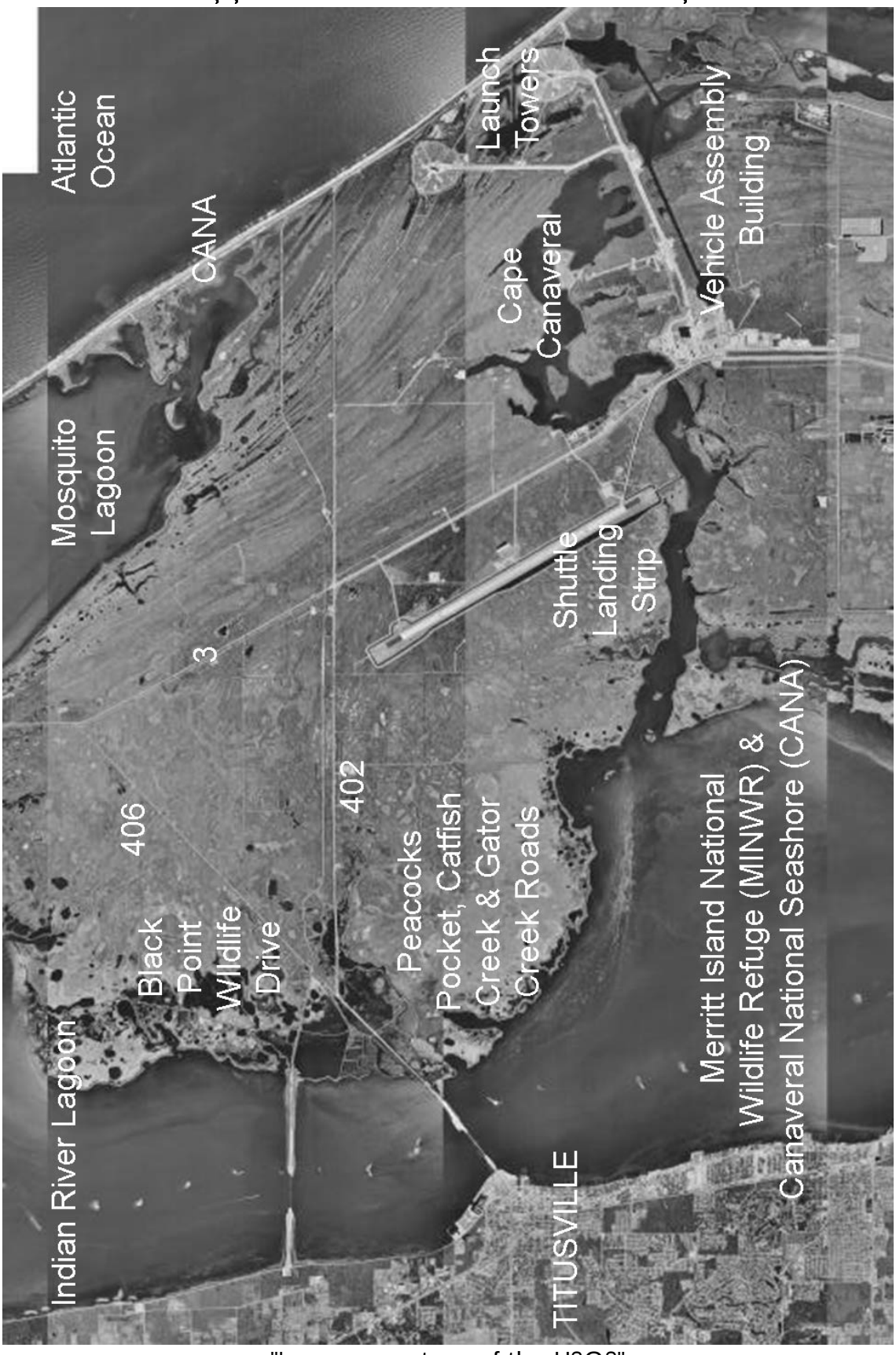
Appendix List

1. MINWR Aerial Map (USGS – Reference 2) and MINWR FWS prepared maps (see Reference 1)
2. MINWR Bird Checklist
3. MINWR- Black Point Wildlife Drive Tour Brochure

References

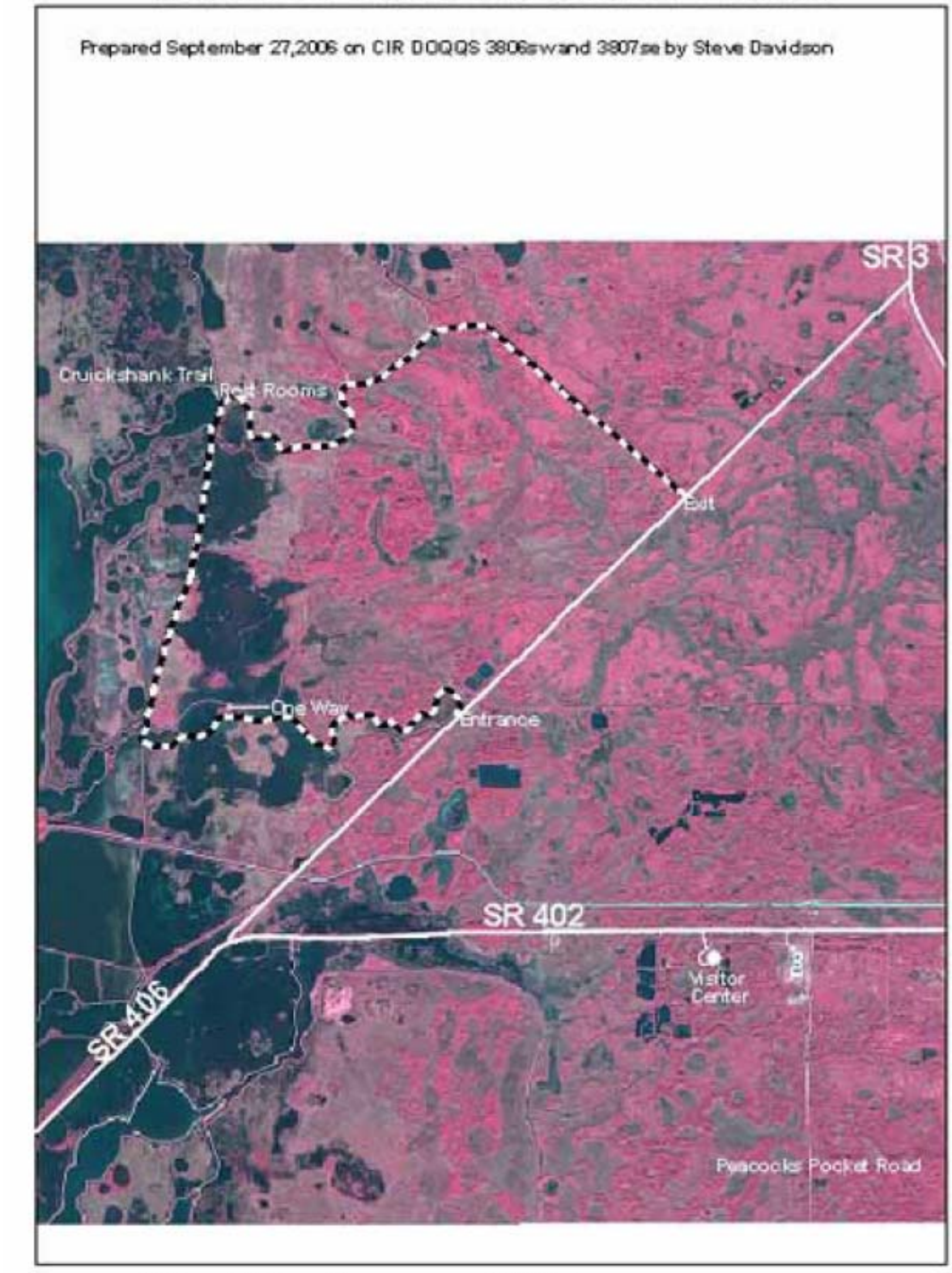
1. Maps of the drives and trails in the Merritt Island National Wildlife Refuge, Steve Davidson, 11/16/06: http://www.fws.gov/merrittisland/Maps-DrivesTrails/
2. Annotated map images used in the site guide provided by USGS at http://terraserver.microsoft.com/. From the TerraServer website FAQ: The images are from the U.S. Geological Survey, and are freely available for you to download, use and re-distribute. The TerraServer team and the USGS appreciate credit for their work on this project by displaying the message "Image courtesy of the USGS".

Appendix 1 – MINWR Aerial Maps

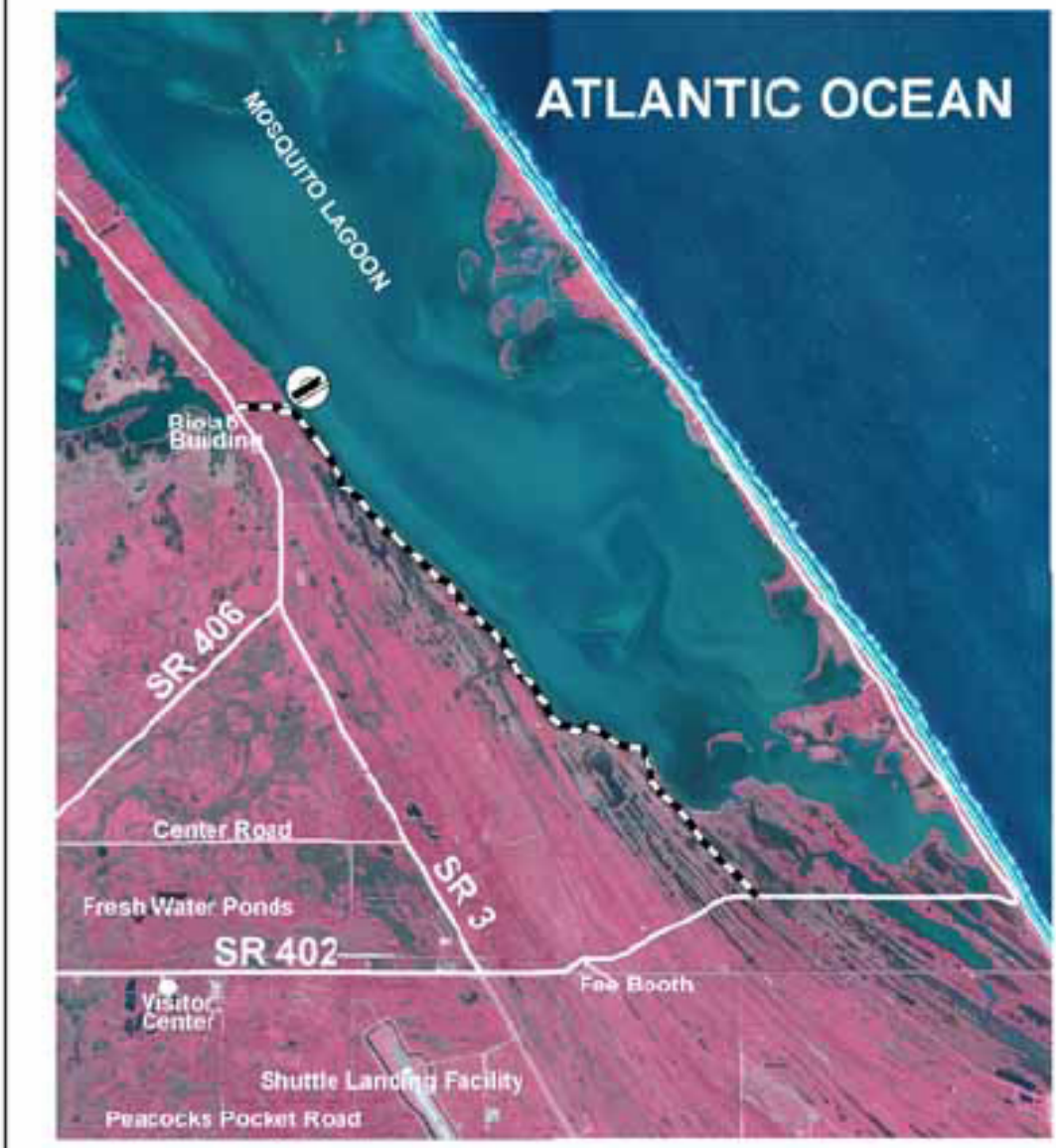


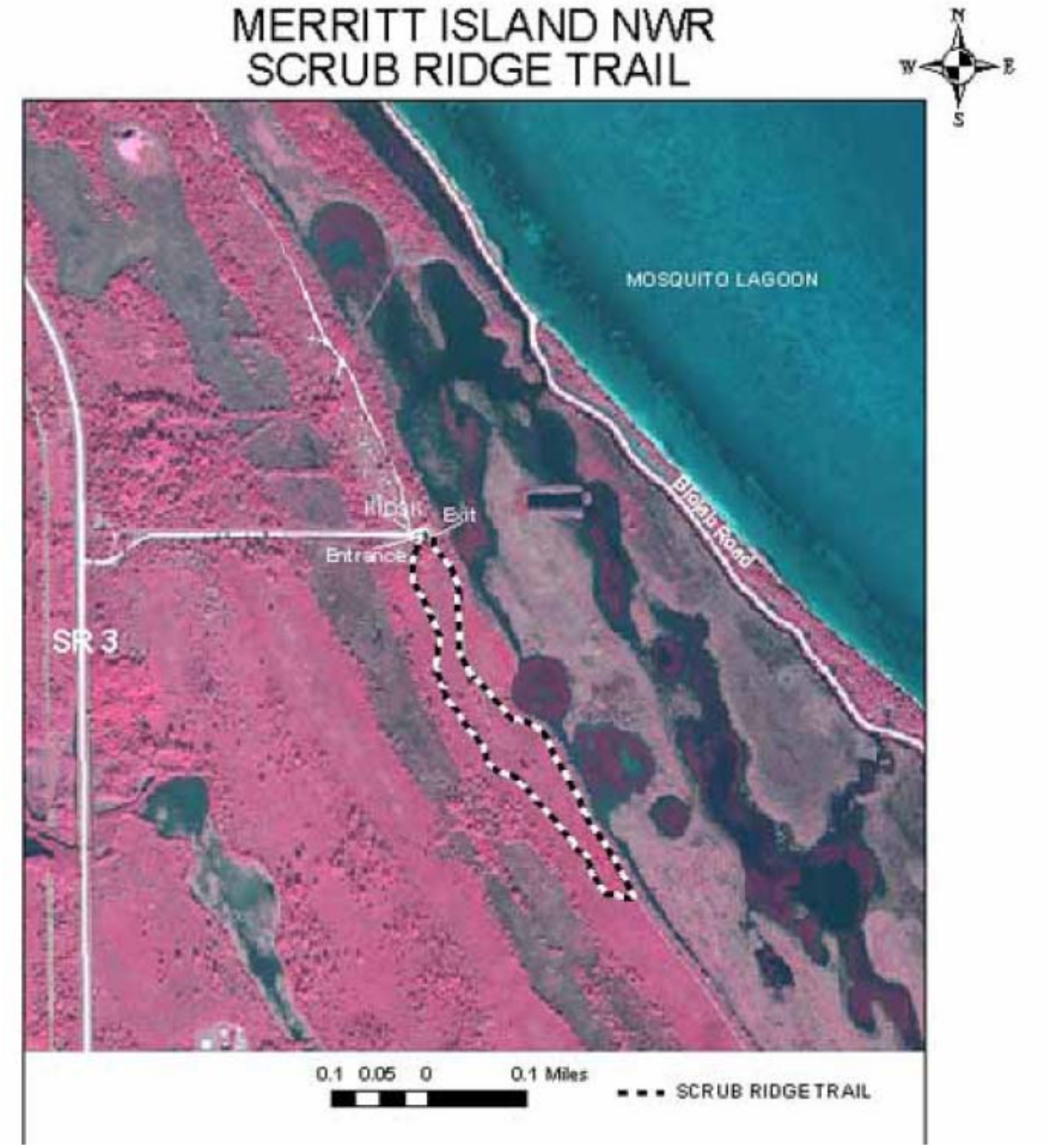
"Image courtesy of the USGS"

MERRITT ISLAND NWR
BLACK POINT WILDLIFE DRIVE



MERRIT ISLAND NWR
BIOLAB ROAD




MERRITT ISLAND NWR
SCRUB RIDGE TRAIL
N
W
E
S
MOSQUITO LAGOON
Exit
Entrance
SR 3
0.1 0.05 0
0.1 Miles
SCRUB RIDGE TRAIL

MERRITT ISLAND NWR
GATOR CREEK ROAD

red October 6 2006 on 2004 CIR DOQQS 3707ne and 3807se by Steve Davidson

MERRITT ISLAND NWR
EAST GATOR CREEK ROAD

MERRITT ISLAND NWR
WEST GATOR CREEK ROAD

MERRITT ISLAND NWR
CATFISH CREEK LOOP ROAD

MERRITT ISLAND NWR
PEACOCKS POCKET ROAD

red September 29,2006 on CIR DOQQS 3707ne,3706nw,3806sw,3807se by Steve Davidson

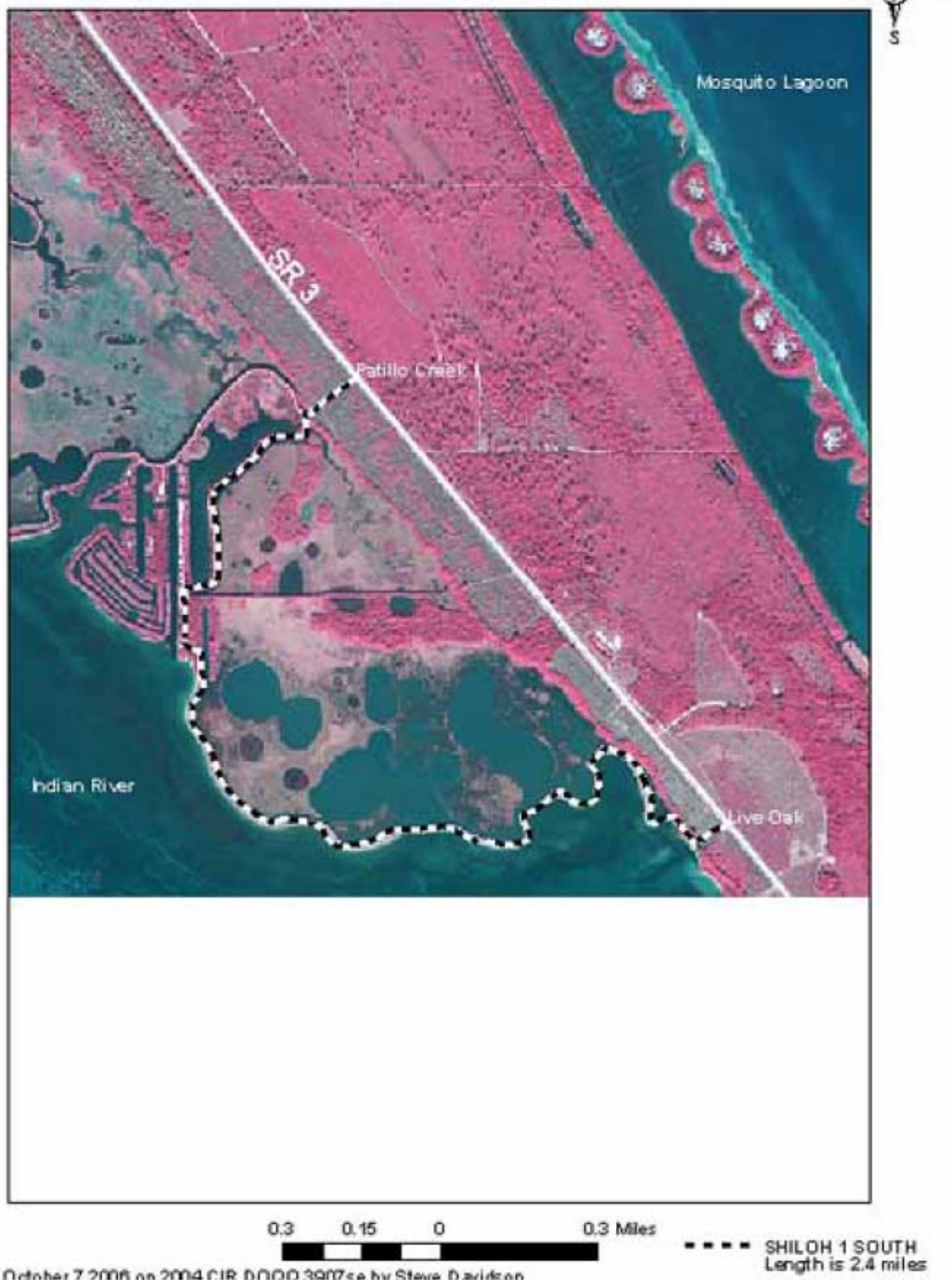

MERRITT ISLAND NWR
SHILOH MARSH ROAD
N
W
E
S
ATLANTIC
OCEAN
MOSQUITO LAGOON
US 1
SR 3
Entrance at
Live Oak
INDIAN RIVER LAGOON
1 0.5 0 1 Miles
SHILOH MARSH ROAD
Length is 12.6 miles


MERRITT ISLAND NWR
SHILOH 5
N
W
E
S
ATLANTIC OCEAN
US 1
SR 3
Entrance
Indian River Lagoon
1
0.5
0
1 Miles
SHILOH 5
LENGTH IS 5.7 MILES

MERRITT ISLAND NWR
SHILOH 3


MERRITT ISLAND NWR
SHILOH 1 NORTH
N
W
E
S
SR 3
Indian River Lagoon
0.4
0.2
0
0.4 Miles
SHILOH 1 NORTH
Length is 5.3 miles

MERRITT ISLAND NWR
SHILOH 1 SOUTH



MERRITT ISLAND NWR
CRUICKSHANK TRAIL


MERRITT ISLAND NWR
L POND ROAD
N
W
E
S
Summit Cove
Sendler Education Outpost
SR 3
Black Point Wildlife Drive
SR 406
0.5 0.25 0 0.5 Miles
LPOND ROAD
Length is 5 miles

CANAVERAL NATIONAL SEASHORE
EDDY CREEK CANOE/KAYAK LAUNCH

MERRITT ISLAND NWR
DUMMIT COVE CANOE/KAYAK LAUNCH

APPENDIX 2 - MINWR & CANA Birding Checklist

Northern Prairie Wildlife Research Center

Bird Checklists of the United States

Merritt Island National Wildlife Refuge

Titusville, Florida

Merritt Island National Wildlife Refuge, located just east of Titusville, Florida, shares a common boundary with the John F. Kennedy Space Center. Its coastal location, tropic-like climate, and wide variety of habitat types contribute to Merritt Island's diverse bird population. To date, 310 bird species have been identified on the refuge.

Of special interest are the breeding populations of southern bald eagles, brown pelicans, wood storks and mottled ducks. Spectacular migration of passerine birds, especially warblers, occurs during spring and fall. Winter peak concentrations of waterfowl often exceed 100,000. Eight species of herons and egrets are commonly observed year-round.

Tips On Birding

A good field guide and binoculars provide the basic tools useful in the observation and identification of birds. While the marshes and shallow impoundments are the most popular birding areas, mangrove-rimmed shorelines, cabbage palm and hardwood hammocks, palmetto and pine uplands, and the beach are all excellent places to find a variety of different bird species. The cool weather months (October-April) are generally the best times of year for birding. The best time of day is early morning and late afternoon.

Using This List

The check list is arranged taxonomically by order (solid line) and family (screened line). Representatives from 18 orders and 62 families have been identified on the refuge.

The word family is a classification term that places birds of similar appearance and habits into one group. Closely related families make up an order. All birds in the same order have some common characteristics. Learning to recognize families and orders can help in identifying new birds you may encounter at Merritt Island Refuge.

The bird list is in accordance with the American Ornithologists' Union "Check-List of North American Birds" as revised in 1982. Season and abundance are coded as follows:

Seasonal Occurrence

S - Spring - March to May
s - Summer - June to August
F - Fall - September to November
W - Winter - December to February

You may see some species outside the seasons indicated on the check list. This phenomenom is quite common for many birds. However, the check list is designed to indicate the general trend of migration and seasonal abundance for each species and therefore, does not account for unsual occurrence.

Abundance Designation

c - common: These birds are present in large numbers, are widespread, and should be seen if you look in the right habitat.

u - uncommon: These are present, but because of their low numbers, behavior, habitat, or distribution, they are not usually seen. However, an average bird watcher should be able to find them by looking in the right places at the right time.

o - occasional: These birds are present in low numbers and are not expected to be seen without a special effort to find them. At least a few are seen each year.

r - rare: These birds are not expected to be seen every year. They occur in low numbers, may also be secretive or hard to identify, and may be unreported for several years.

* - breeds on the refuge

LOONS	S	s	F	W
___ Common Loon	u	-	o	c
___ Red-throated Loon	-	-	-	r

GREBES	S	s	F	W
___ Horned Grebe	o	-	c	c
___ Pied-billed Grebe*	c	u	c	c

SHEARWATER, STORM-PETREL	S	s	F	W
___ Greater Shearwater	-	r	r	-
___ Audubon's Shearwater	-	r	r	r
___ Wilson's Storm-Petrel	r	r	r	-

PELICANS, GANNET, CORMORANT	S	s	F	W
___ American White Pelican	c	o	o	c
___ Brown Pelican*	c	c	c	c
___ Northern Gannet	o	-	r	u
___ Double-crested Cormorant*	c	c	c	c
___ Anhinga*	c	c	c	c
___ Magnificent Frigatebird	r	r	r	r

HERONS, EGRETS, IBIS, SPOONBILL	S	s	F	W
___ Great Blue Heron*	c	c	c	c
___ Green-backed Heron*	c	c	c	c
___ Little Blue Heron*	c	c	c	c
___ Cattle Egret*	c	c	c	u
___ Reddish Egret*	o	o	u	u
___ Great Egret*	c	c	c	c
___ Snowy Egret*	c	c	c	c
___ Tri-colored Heron*	c	c	c	c
___ Black-crowned Night-Heron*	u	u	u	u
___ Yellow-crowned Night-Heron	o	o	o	o
___ Least Bittern*	u	u	u	u
___ American Bittern	-	-	o	o
___ Wood Stork*	c	c	c	c
___ Glossy Ibis*	c	c	c	c
___ White Ibis*	c	c	c	c
___ Roseate Spoonbill	u	c	o	r
___ Greater Flamingo	o	o	o	o

GEESE, DUCKS	S	s	F	W
___ Canada Goose	-	-	-	r
___ Brant	r	-	-	r
___ Snow Goose	-	-	r	o
___ Fulvous Whistling-Duck	o	-	o	o
___ Mallard	r	-	o	o
___ American Black Duck	r	-	o	o
___ Mottled Duck*	c	c	c	c
___ Gadwall	u	-	u	u
___ Northern Pintail	u	-	c	c
___ Green-winged Teal	u	-	c	c

___ Blue-winged Teal	c	o	c	c
___ American Wigeon	c	r	c	c
___ European Wigeon	r	-	r	r
___ Northern Shoveler	c	r	c	c
___ Wood Duck*	o	r	o	o
___ Canvasback	u	r	u	u
___ Redhead	u	r	u	u
___ Ring-necked Duck	o	-	c	c
___ Greater Scaup	r	-	o	o
___ Lesser Scaup	c	o	c	c
___ Common Goldeneye	-	-	r	r
___ Bufflehead	r	-	o	o
___ Oldsquaw	-	-	r	r
___ White-winged Scoter	r	-	-	o
___ Surf Scoter	r	-	-	r
___ Black Scoter	r	r	r	o
___ Ruddy Duck	o	-	c	c
___ Hooded Merganser	o	-	c	c
___ Red-breasted Merganser	u	r	c	c

VULTURES, HAWKS, FALCONS, OSPREY	S	s	F	W
___ Turkey Vulture*	c	c	c	c
___ Black Vulture*	c	c	c	c
___ American Swallow-tailed Kite	o	o	-	-
___ Sharp-shinned Hawk	o	-	u	u
___ Cooper's Hawk	o	o	o	o
___ Red-tailed Hawk*	c	c	c	c
___ Red-shouldered Hawk*	u	u	u	u
___ Broad-winged Hawk	r	-	o	r
___ Swainson's Hawk	-	-	r	r
___ Bald Eagle*	u	u	u	u
___ Northern Harrier	u	-	c	c
___ Osprey*	c	c	c	c
___ Peregrine Falcon	r	-	o	o
___ Merlin	o	-	o	o
___ American Kestrel	u	r	c	c

QUAIL, TURKEY	S	s	F	W
___ Northern Bobwhite*	c	c	c	c
___ Wild Turkey*	o	o	o	o

LIMPKINS, RAILS, GALLINULE, COOT	S	s	F	W
___ Limpkin	r	-	-	r
___ King Rail*	o	o	o	o
___ Clapper Rail*	o	o	o	o
___ Virginia Rail	r	-	o	o
___ Sora	o	-	u	u
___ Black Rail*	r	r	r	r
___ Common Moorhen*	c	c	c	c
___ American Coot	c	o	c	c

PLOVERS, SANDPIPERS, GULLS, TERNS	S	s	F	W
___ American Oystercatcher*	o	o	o	r
___ Semipalmated Plover	o	r	o	c
___ Piping Plover	o	-	o	o
___ Wilson Plover*	o	o	o	r
___ Killdeer*	c	c	c	c
___ Black-bellied Plover	u	o	c	c
___ Ruddy Turnstone	c	o	c	c
___ American Woodcock	-	-	r	r
___ Common Snipe	o	-	u	u
___ Long-billed Curlew	r	-	r	r
___ Whimbrel	o	-	o	o
___ Upland Sandpiper	r	-	r	-
___ Spotted Sandpiper	u	o	u	u
___ Solitary Sandpiper	o	-	o	r
___ Willet*	c	c	c	c
___ Greater Yellowlegs	c	o	c	c
___ Lesser Yellowlegs	c	o	c	c

___ Red Knot	o	o	o	o
___ Pectoral Sandpiper	o	r	o	r
___ White-rumped Sandpiper	o	r	o	r
___ Least Sandpiper	c	o	c	c
___ Dunlin	c	o	c	c
___ Short-billed Dowitcher	u	o	c	c
___ Stilt Sandpiper	o	r	o	o
___ Semipalmated Sandpiper	c	o	c	-
___ Western Sandpiper	c	u	c	c
___ Marbled Godwit	o	-	o	o
___ Sanderling	c	u	c	c
___ American Avocet	o	o	c	c
___ Black-necked Stilt*	u	u	u	-
___ Wilson's Phalarope	-	r	r	-
___ Northern Phalarope	r	r	-	-
___ Pomarine Jaeger	r	-	o	o
___ Parasitic Jaeger	r	-	r	r
___ Great Black-backed Gull	o	o	o	o
___ Herring Gull	c	o	c	c
___ Ring-billed Gull	c	o	c	c
___ Laughing Gull*	c	c	c	c
___ Bonaparte's Gull	o	-	u	c
___ Black-legged Kittiwake	-	-	-	r
___ Gull-billed Tern*	o	u	o	r
___ Forster's Tern	c	o	c	c
___ Common Tern	r	-	r	r
___ Roseate Tern	r	-	r	-
___ Sooty Tern	-	r	r	-
___ Bridled Tern	r	r	r	-
___ Least Tern*	c	c	c	-
___ Royal Tern*	c	c	c	c
___ Sandwich Tern	o	r	o	o
___ Caspian Tern*	u	o	c	c
___ Black Tern	o	-	u	-
___ Black Skimmer*	c	c	c	c

DOVES	S	s	F	W
___ Rock Dove	u	u	u	u
___ Mourning Dove*	c	c	c	c
___ Common Ground-Dove*	c	c	c	c

CUCKOOS, ANIS	S	s	F	W
___ Yellow-billed Cuckoo*	o	o	o	-
___ Black-billed Cuckoo	r	-	r	-
___ Smooth-billed Ani	r	r	r	r

OWLS	S	s	F	W
___ Common Barn Owl*	o	o	o	o
___ Screech-Owl	c	u	c	c
___ Great Horned Owl*	u	u	u	u
___ Barred Owl*	o	o	o	o
___ Short-eared Owl	-	-	o	o

GOATSUCKERS	S	s	F	W
___ Chuck-will's-widow	c	c	c	o
___ Whip-poor-will	r	-	r	r
___ Common Nighthawk*	c	c	u	r

SWIFTS, HUMMINGBIRD	S	s	F	W
___ Chimney Swift*	u	u	u	-
___ Ruby-throated Hummingbird	o	r	o	r

KINGFISHERS	S	s	F	W
___ Belted Kingfisher*	c	o	c	c

WOODPECKERS	S	s	F	W
___ Northern Flicker*	u	u	u	u
___ Pileated Woodpecker*	u	u	u	u
___ Red-bellied Woodpecker*	c	c	c	c
___ Red-headed Woodpecker	r	r	r	r
___ Yellow-bellied Sapsucker	u	-	u	u
___ Hairy Woodpecker	r	-	r	r
___ Downy Woodpecker*	u	u	u	u

FLYCATCHERS, SWALLOWS, WRENS, THRUSHES, WARBLERS, SPARROWS	S	s	F	W
___ Eastern Kingbird*	u	u	u	-
___ Gray Kingbird	o	o	o	-
___ Western Kingbird	-	-	r	r
___ Great Crested Flycatcher*	u	u	o	r
___ Eastern Phoebe	o	-	c	c
___ Acadian Flycatcher	r	-	r	-
___ Alder Flycatcher	-	-	r	-
___ Least Flycatcher	-	-	r	-
___ Tree Swallow	c	r	c	c
___ Bank Swallow	o	r	o	-
___ Northern Rough-winged Swallow	o	r	o	-
___ Barn Swallow	c	r	c	r
___ Cliff Swallow	o	-	o	-
___ Purple Martin*	u	u	r	-
___ Blue Jay*	c	c	c	c
___ Scrub Jay*	c	c	c	c
___ Fish Crow *	c	c	c	c
___ Tufted Titmouse	o	o	o	o
___ House Wren	o	-	c	c
___ Carolina Wren*	c	c	c	c
___ Marsh Wren	o	-	r	o
___ Sedge Wren	u	-	o	u
___ Northern Mockingbird*	c	c	c	c
___ Gray Catbird	c	-	c	c
___ Brown Thrasher*	o	o	o	o
___ American Robin	c	-	c	c
___ Wood Thrush	r	-	r	-
___ Hermit Thrush	o	-	o	o
___ Swainson's Thrush	o	-	o	-
___ Gray-cheeked Thrush	o	-	o	-
___ Veery	o	-	o	-
___ Blue-gray Gnatcatcher*	o	o	u	c
___ Ruby-crowned Kinglet	o	-	o	u
___ Water Pipit	r	-	r	r
___ Cedar Waxwing	o	-	o	c
___ Loggerhead Shrike*	u	u	u	u
___ European Starling*	c	c	c	c
___ White-eyed Vireo*	c	c	c	c
___ Yellow-throated Vireo	u	-	u	r
___ Solitary Vireo	o	-	o	o
___ Black-whiskered Vireo*	o	u	r	-
___ Red-eyed Vireo	o	o	o	-
___ Black-and-white Warbler	c	-	c	u
___ Prothonotary Warbler	o	-	o	-
___ Swainson's Warbler	r	-	r	-
___ Worm-eating Warbler	r	-	o	-
___ Blue-winged Warbler	r	-	o	-
___ Golden-winged Warbler	-	-	r	-
___ Tennessee Warbler	o	-	o	r
___ Orange-crowned Warbler	o	-	o	u
___ Nashville Warbler	r	-	r	-
___ Northern Parula	o	o	o	r
___ Yellow Warbler	o	-	o	r
___ Magnolia Warbler	o	-	o	-
___ Cape May Warbler	u	-	u	r
___ Black-throated Blue Warbler	u	-	u	r
___ Yellow-rumped Warbler	u	-	c	c
___ Black-throated Green Warbler	r	-	o	-
___ Blackburnian Warbler	o	-	o	o
___ Yellow-throated Warbler	o	-	o	o
___ Chestnut-sided Warbler	r	-	o	-
___ Bay-breasted Warbler	r	-	u	r
___ Blackpoll Warbler	u	-	o	-

___ Pine Warbler*	o	o	o	o
___ Prairie Warbler*	u	u	u	u
___ Palm Warbler	u	-	c	c
___ Ovenbird	u	-	u	o
___ Northern Waterthrush	u	-	u	r
___ Louisiana Waterthrush	r	-	r	-
___ Kentucky Warbler	r	-	r	-
___ Connecticut Warbler	r	-	r	-
___ Common Yellowthroat*	c	c	c	c
___ Yellow-breasted Chat*	r	r	r	r
___ Hooded Warbler	o	-	o	-
___ Wilsons's Warbler	-	-	r	-
___ American Redstart	u	-	c	r
___ House Sparrow*	c	c	c	c
___ Bobolink	u	-	o	-
___ Eastern Meadowlark*	c	c	c	c
___ Red-winged Blackbird*	c	c	c	c
___ Orchard Oriole	r	-	r	-
___ Northern Oriole	o	-	o	-
___ Rusty Blackbird	r	-	r	r
___ Boat-tailed Grackle*	c	c	c	c
___ Common Grackle*	c	c	c	c
___ Brown-headed Cowbird	u	o	u	u
___ Scarlet Tanager	o	-	o	-
___ Summer Tanager*	o	o	o	-
___ Northern Cardinal*	c	c	c	c
___ Rose-breasted Grosbeak	o	-	o	-
___ Blue Grosbeak*	o	o	r	-
___ Indigo Bunting*	o	o	o	o
___ Painted Bunting*	o	o	o	o
___ Dickcissel	r	-	r	r
___ Pine Siskin	-	-	r	r
___ American Goldfinch	r	-	u	u
___ Rufous-sided Towhee*	c	c	c	c
___ Savannah Sparrow	c	-	c	c
___ Grasshopper Sparrow	o	-	o	o
___ Henslow's Sparrow	-	-	r	r
___ Sharp-tailed Sparrow	o	-	o	o
___ Seaside Sparrow	-	-	o	o
___ Vesper Sparrow	r	-	r	o
___ Lark Sparrow	-	-	r	r
___ Bachman's Sparrow*	r	r	r	r
___ Chipping Sparrow	o	-	o	o
___ Field Sparrow	r	-	r	o
___ White-throated Sparrow	-	-	r	r
___ Fox sparrow	-	-	r	r
___ Swamp Sparrow	o	-	c	c
___ Song Sparrow	r	-	o	o
___ Lincoln's Sparrow	-	-	r	r

Since the refuge is situated along the coast, it is on a major migration corridor, is subject to violent storms, and is frequented by many experienced birdwatchers, the list of accidental species is quite large. The following species have been seen less than 5 times on the refuge or have not been seen at all since 1972. Where known, the year the bird was last observed is provided:

Red-necked Grebe	1977
Eared Grebe	1976
Western Grebe	1978
White-tailed Tropicbird	1981
Blue-faced Booby	1978
Brown Booby	1990
Great Cormorant	1979
Whistling Swan	1973
White-cheeked Pintail	1990
Cinnamon Teal	1989
Harlequin Duck	1960
Mississippi Kite	1992
Sandhill Crane	1992
Purple Gallinule	1989
Yellow Rail	1989
Lesser Golden-Plover	1988
Purple Sandpiper	1980
Buff-breasted Sandpiper	1988
Hudsonian Godwit	1958
Black-tailed Godwit	1981
Ruff	1989
Red Phalarope	

Glaucous Gull	
Sabine's Gull	1963
Noddy Tern	
Burrowing Owl	1976
Red-cockaded Woodpecker	1976
Scissor-tailed Flycatcher	1969
Olive-sided Flycatcher	1974
Horned Lark	1951
American Crow	1976
Brown-headed Nuthatch	
Brown Creeper	
Golden-crowned Kinglet	1991
Western Meadowlark	1972
Purple Finch	
Dark-eyed Junco	1977
White-crowned Sparrow	1990
Lapland Longspur	1988
Franklin's Gull	1987
Common Black-headed Gull	1991
Black-shouldered Kite	1991
L. Black-backed Gull	1992
Warbling Vireo	1989
Snail Kite	1990

For additional information contact:

Refuge Manager
Merritt Island NWR
P.O. Box 6504
Titusville, Florida 32782
Telephone: 321/861-0667

or visit the Merritt Island NWR website at: ***http://merrittisland.fws.gov***

This resource is based on the following source:

U.S. Fish and Wildlife Service. No date. Merritt Island National Wildlife Refuge birds. U.S. Fish and Wildlife Service. Unpaginated.

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URL: http://www.npwrc.usgs.gov/resource/birds/chekbird/r4/merritt.htm
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Page Last Modified: August 3, 2006

LISTED SPECIES OF THE MERRITT ISLAND NATIONAL WILDLIFE REFUGE

Compiled by: Marc Epstein, and Gary Popotnik, Refuge Biologists
US Fish and Wildlife Service
Merritt Island National Wildlife Refuge

Updated October 23, 2002

LISTED SPECIES OF THE MERRITT ISLAND NATIONAL WILDLIFE REFUGE

Listed species are plants or animals that have been "listed" by a State and/or Federal agency with special protection or conservation designations, however, some may be listed by a non-governmental agency that do not have regulatory protection. Those species with regulatory protection, such as State and Federal Endangered and Threatened species, are protected by law. State Species of Special Concern (SSC) are afforded special protection, recognition, or consideration (Florida Administrative Code 39-1.004). Nongame Birds of Management Concern are those bird species that are being considered for listing by the US Fish and Wildlife Service (Office of Migratory Bird Management 1995).

Updated : October 23, 2002

Types of Designations

Agencies Listing Species

Florida Fish & Wildlife Conservation Commission **(FWC)**
Florida Department of Agriculture and Consumer Services **(FDA)**
US Fish & Wildlife Service **(FWS)**

Listing Designation

Endangered (E) means "without special management efforts, these species are considered rare enough to become extinct." (Federal and State)

Threatened (T) means "without special management efforts, these species may become endangered of becoming extinct. (Federal and State)

Species of Special Concern (SSC) means that the species warrants special protection because of concern that it could become threatened. (State)

Nongame Birds of Management Concern (SMC) is similar to SSC, in that without additional conservation action, they are likely to becomes candidates of listing under the Endangered Species Act. This designation promotes management actions for the species and is not a regulatory designation. (Federal).

Former FWS Candidate Species (UR) are species that were previously listed as candidates of becoming formally listed as Threatened or Endangered by the US Fish and Wildlife Service.

FNAI means that the species has been ranked by the Florida Natural Areas Inventory.

CITES means that the species is listed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

FCREPA means the species is listed by Florida Committee on Rare and Endangered Plants and Animals.

Based the listing designations, there are presently 20 State and Federally Listed Threatened or Endangered animals on the Merritt Island NWR. There are an additional 41 animal species designated as species of "Special Concern" by State or Federal agencies. There are 31 plant species listed by the State as Threatened, Endangered, or commercially exploited (5 species), however, there are no known Federally listed plant species on Merritt Island NWR. Included in the list are 17 additional plant species that have special designations (e.g., UR, FNAI, CITES, or FCREPA). Some plant species may have both a State and special designation.

A total of 109 species are listed here including: 1 fish, 1 amphibian, 10 reptiles, 45 birds, 4 mammals, and 48 plants. There may be species in Florida that are protected but not listed here because the species either has not been confirmed or has been extirpated.

Number of plants and animals at Merritt Island NWR by special designation category.

	Federal			State			
Animal Spp.	E	T	SSC	E	T	SSC	Other Designation
Fishes	0	0	0	0	0	1	na
Amphibians	0	0	0	0	0	1	na
Reptiles	4	4	0	4	3	3	na
Birds	2	4	30	3	6	10	na
Mammals	1	1	0	1	2	1	na
Plants	0	0	10[1]	15	11	5	40 [2]
TOTAL	7	9	40	23	22	21	40

[1] Former FWS Candidate Species (UR)

[2] FNAI, CITES, or FCREPA

Listed Species of the Merritt Island National Wildlife Refuge

Scientific Names	Common Names	Agency Status FWC	FWS
Fish			
Centropomus undecimalis	Common snook	SSC	
Amphibians			
Rana capito	Gopher (=crawfish) frog	SSC	
Reptiles			
Alligator mississippiensis	American alligator [1]	SSC	T(S/A)[1]
Caretta caretta	Atlantic loggerhead turtle	T	T
Chelonia mydas mydas	Atlantic green turtle	E	E
Dermochelys coriacea	Leatherback (=leathery) turtle	E	E
Drymarchon corais couperi	Eastern indigo snake	T	T
Lepidochelys kempi	Atlantic ridley turtle [3]	E	E

Scientific Names	Common Names	Agency Status FWC	FWS
Eretmochelys imbriccata imbratica	Atlantic hawksbill turtle [3]	E	E
Gopherus polyphemus	Gopher tortoise	SSC	
Pituophis melanoleucus mugitus	Florida Pine Snake [4]	SSC	
Nerodia fasciata taeniata	Atlantic salt marsh snake [2]	T	T

1 (S/A) means species was listed due to "similarity of appearance" with the American crocodile.

2 Within species home range, not officially recorded (Moler 1992, Blihovde 1996, Seigel and Seigel 2000).

3 Ehrhart 1983.

4 R. Seigel (personel communication)

Birds

Spizella pusilla	Field sparrow		SMC
Ammodramus henslowii	Henslow's sparrow		SMC
Aimophila aestivalis	Bachman's sparrow		SMC
Passerina ciris	Painted bunting		SMC
Sturnella magna	Eastern meadowlark		SMC
Dolichonyx oryzivorus	Bobolink		SMC
Dendroica discolor	Prairie warbler		SMC
Dendroica pensylvanica	Chestnut-sided warbler		SMC
Lymnothylpis swainsonii	Swainson's warbler		SMC
Vireo altiloguus	Black-whiskered Vireo		SMC
Lanius ludovicianus	Loggerhead Shrike		SMC
Cistothorus platenis	Sedge wren		SMC
Hylocichla mustelina	Wood thrush		SMC
Catharus fuscescens	Veery		SMC
Colaptes auratus	Northern Flicker		SMC
Columbina passerina	Ground dove		SMC
Aphelocoma coerulescens	Florida scrub-jay	T	T
Aramus guarauna	Limpkin	SSC	SMC
Charadrius melodus	Piping plover	T	T
Charadrius wilsonia	Wilson's Plover		SMC
Ajaia ajaja	Roseate spoonbill	SSC	
Botaurus lentiginosus	American Bittern		SMC
Ixobrychus exilis	Least Bittern		SMC
Egretta caerulea	Little blue heron	SSC	
Egretta rufescens	Reddish egret	SSC	SMC
Egretta thula	Snowy egret	SSC	
Egretta tricolor	Tricolored (=Louisiana) heron	SSC	
Eudocimus albus	White ibis	SSC	

Scientific Names	Common Names	FWC	FWS
Falco peregrinus tundrius	Arctic peregrine falcon	E	
Elanoides forficatus	Swallow-tailed kite		SMC
Rosthrhramus sociabilis	Snail kite	E	E
Circus cyaneus	Northern Harrier		SMC
Grus canadensis pratensis	Florida sandhill crane	T	
Haematopus palliatus	American oystercatcher	SSC	
Mycteria americana	Wood stork	E	E
Gavia immer	Common Loon		SMC
Pelecanus occidentalis	Brown pelican	SSC	SMC
Laterallus jamaicensis	Black rail		SMC
Rynchops niger	Black skimmer	SSC	
Sterna antillarum	Least tern	T	SMC
Sterna dougallii	Roseate tern	T	T
Chlidonias niger	Black tern		SMC
Tyto alba	Barn owl		SMC
Asio flammeus	Short-eared Owl		SMC
Haliaeetus leucocephalus	Bald eagle	T	T

Mammals

Peromyscus polionotus niveiventris	Southeastern beach mouse	T	T
Podomys floridanus	Florida mouse	SSC	
Trichechus manatus	West Indian (=Florida) manatee	E	E
Ursus americanus floridanus	Florida black bear	T	

PLANTS [1]

GENUS	SPECIES	COMMON NAME	FDA	FWS	OTHER
Amyris	*balsamifera*	Balsam torchwood			FNAI
Asclepias	*curtissii*	Curtiss milkweed	E		FNAI
Avicennia	*germinans*	Black mangrove			FCREPA
Calamovilfa	*curtissii*	Curtiss reedgrass	T	UR	FNAI
Calopogon	*barbatus*	Grass pink (unnamed)			CITES
Calopogon	*multiflorus*	Many-flowered grass pink	E		CITES
Calopogon	*tuberosus*	Grass pink (unnamed)			CITES
Cereus	*gracilis, var. simpsonii*	Prickly apple			CITES
Cereus	*undatus*	Night-blooming cereus			CITES
Chamaesyce	*cumulicola*	Sand dune spurge	E	UR	FNAI
Chrysophyllum	*oliviforme*	Stainleaf	T		
Encyclia	*tampensis*	Butterfly orchid	C [2]		CITES
Epidendrum	*canopseum*	Greenfly orchid	C [2]		CITES

GENUS	SPECIES	COMMON NAME	FDA	FWS	OTHER
Eulophia	*ecristata*	False coco	T		CITES, FNAI
Habenaria	*repens*	Water spider orchid			CITES
Harrisella	*filiformis*	Orchid (unnamed)	T		CITES
Hexalectris	*spicata*	Crested coralroot			CITES
Lantana	*depressa var. floridana*	East coast lantana	E	UR	FNAI
Lechea	*cernua*	Nodding pinweed	T	UR	FNAI
Lechea	*divaricata*	Pine pinweed	E	UR	FNAI
Lilium	*catesbaei*	Catesby lily	T		FNAI
Malaxis	*spicata*	Florida malaxis			CITES
Myrcianthes	*fragrans*	Nakedwood	T	UR	FANI
Ophioglossum	*palmatum*	Adder's tongue fern (unnamed)	E		FCREPA, FNAI
Opuntia	*compressa*	Prickly pear cactus (unnamed)			CITES
Opuntia	*stricta*	Prickly pear cactus (unnamed)	T		CITES
Osmunda	*cinnamomea*	Cinnamon fern	C [2]		
Osmunda	*regalis, var. spectabilis*	Royal fern	C [2]		
Pavonia	*spinifex*	Yellow Hibiscus			FNAI
Peperomia	*humilis*	Pepper (unnamed)	E		FNAI
Peperomia	*obtusifolia*	Florida peperomia	E		FNAI
Pereskia	*aculeata*	Lemon vine			CITES
Persea	*humilis*	Scrub bay			FNAI
Pogonia	*ophioglossoides*	Rose pogonia	T		CITES
Polypodium	*plumula*	Polypody fern (unnamed)	E		
Ponthieva	*racemosa*	Shadow witch			CITES
Remirea	*maritima*	Beach-star	E		
Rhizophora	*mangle*	Red mangrove			FCREPA
Rhynchosia	*cinerea*	Brown-haired snoutbean		UR	
Scaevola	*plumieri*	Scaevola	T		
Sophora	*tomentosa*	Necklace pod			FNAI
Spiranthes	*laciniata*	Lace-lip ladies'-tresses; lace-lip spiral orchid	T		CITES
Tephrosia	*angustissima. var. curtissii*	Narrow-leaved hoary pea; coastal hoary pea	E	UR	FNAI
Tillandsia	*utriculata*	Giant wild pine; giant air plant	E		
Tournefortia	*gnaphalodes*	Sea lavander	E		FCREPA, FNAI
Verbena	*maritima*	Coastal vervain	E	UR	FNAI
Verbena	*tampensis*	Tampa vervain	E	UR	FNAI
Zamia	*pumila*	East coast coontie	C [2]		CITES, FCREPA

[1] Mostly from Schmalzer and Hinkle 1990; and, P. Schmalzer, personal communication

[2] "C" means commercially exploited.

References:

Blihovde, William Boyd. 1996. Distribution of the *Nerodia clarkii* Complex in Volusia, Brevard, and Indian River Counties, Merritt Island National Wildlife Refuge Complex and Canaveral National Seashore. UnPubl. Report to Merritt Island NWR.

Ehrhart, Llewellyn M.. 1983. Marine Turtles of the Indian River Lagoon System. Florida Scientist, Vol 46.

Florida Fish and Wildlife Commission. 1997. Florida's endangered species, threatened species and species of special concern: official list. Florida Game and Fresh Water Fish Commission.

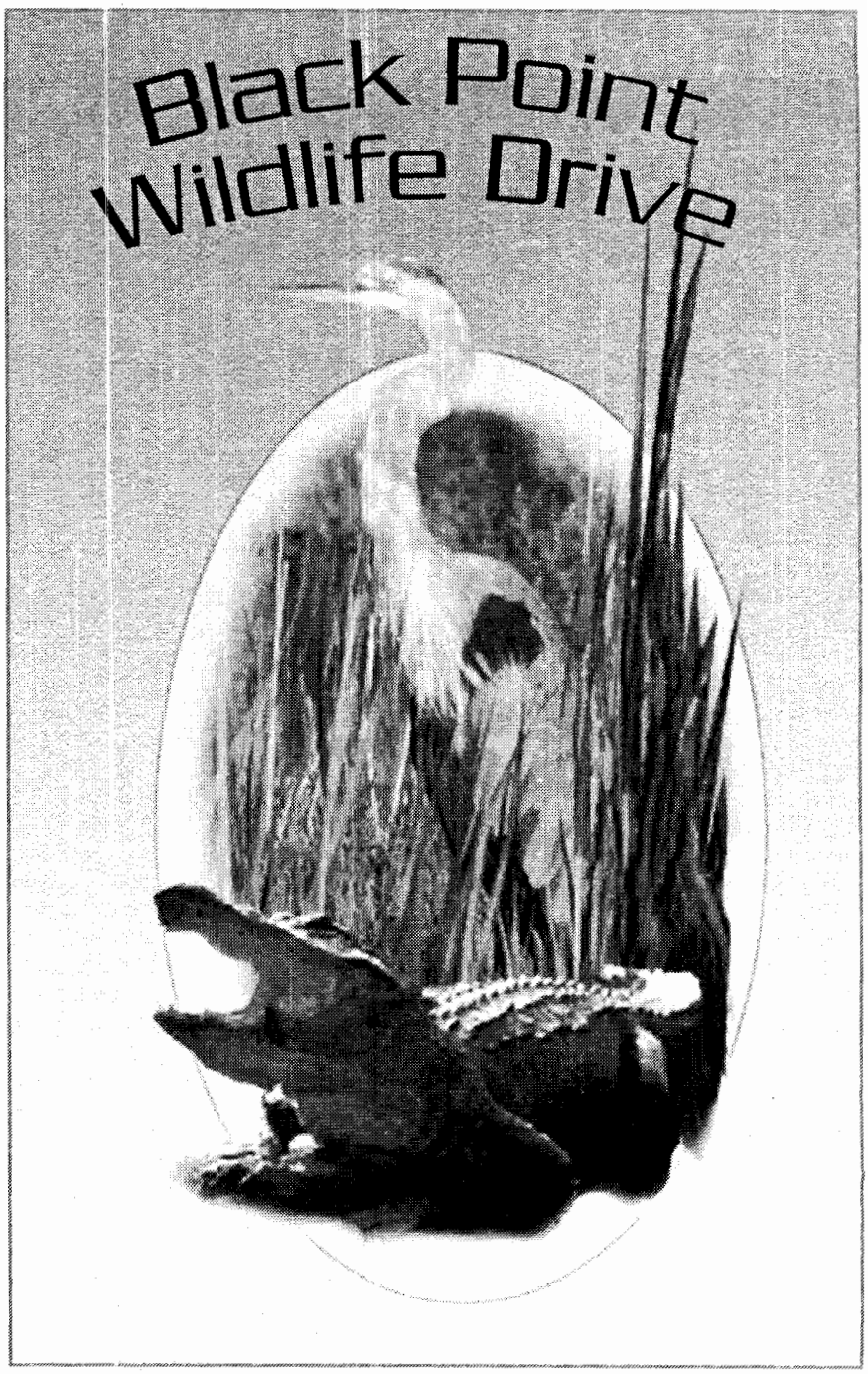
Humphrey, S. R. (Editor). 1992. Rare and endangered biota of Florida: Vol. I. Mammals. Univ. Press Fl., Gainesville, 392pp.

Moler, P. E. (Editor). 1992. Rare and endangered biota of Florida: Vol. III. Amphibians and reptiles. Univ. Press Fl., Gainesville, 291pp.

Office of Migratory Bird Management. 1995. Migratory nongame birds of management concern in the United States: the 1995 list. USFWS, Washington, DC. 22pp.

Schmalzer, P. A. and C. R. Hinkle. 1990. Flora and threatened and endangered plants of John F. Kennedy Space Center, Fl. NASA Tech. Memo. 102791. 68pp.

Seigel, Richard A., and Nadia A. Seigel. 2000. Inventory and Monitoring of Herpetological Communities on the Kennedy Space Center/Merritt Island National Wildlife Refuge/Canaveral National Seashore: Annual Report. Southeastern Louisiana University. UnPubl. Report to Merritt Island NWR.


Black Point
Wildlife Drive
Merritt Island National Wildlife Refuge

Black Point Wildlife Drive

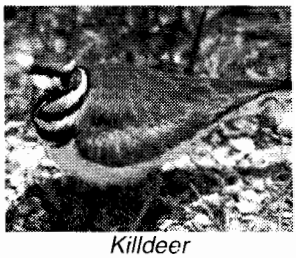
Merritt Island National Wildlife Refuge

Welcome

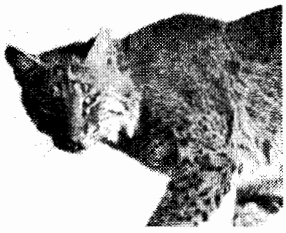
Merritt Island National Wildlife Refuge, a premier wildlife location, welcomes you to Black Point Wildlife Drive, a 7-mile auto tour through one of our best wildlife viewing areas. This brochure serves as a guide to each of the drive's 12 stops. Refuge staff would like to offer a few suggestions to enhance your visit and keep you and the wildlife safe.

- Bring your field guides and binoculars to help identify plants and animals you may see.
- Visit when wildlife are most active in early morning or late afternoon. Also, plan your visit during peak wildlife season from October - March.
- Wild animals can be elusive. Every bush and turn may provide a viewing opportunity. Wildlife are accustomed to quiet, slow-moving vehicles. Drive slowly and look carefully.
- Merritt Island National Wildlife Refuge is a place set aside for animals and plants. Please respect them. Don't approach or feed wildlife.
- Volunteers frequent the drive to assist visitors and locate wildlife viewing opportunities. Please take a moment to chat with these knowledgeable guides.

The Merritt Island Wildlife Association operates a nature store, located in the Refuge Visitor Information Center that sells, rents and loans certain items such as binoculars, field guides, insect repellent and water.



Killdeer

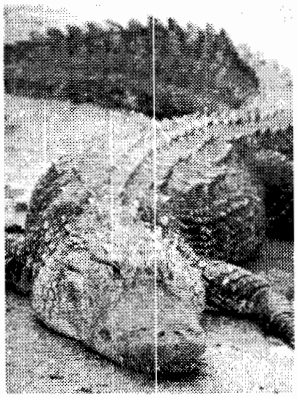


Florida Bobcat

Birds feed in an impoundment.

American Robin

White Pelicans



American Alligator

Drive Information

Black Point Wildlife Drive is open year-round from sunup to sundown, but is subject to closure during NASA shuttle launch operations.

There is no fishing, crabbing or boat launching on the drive.

Please follow the posted speed limits and pull completely off the road when stopping to allow others to pass. Please watch for pedestrians and wildlife and stay in your vehicles to lower wildlife disturbance.

Vehicles over 29 feet and 2.5 tons are prohibited on the drive. Buses are not allowed.

Gated roads are open to foot traffic only.

Do not let animals out of the car and keep barking to a minimum to prevent disturbing wildlife and other visitors. Pets are allowed on Cruickshank trail, but must be kept on a six foot or shorter leash and be under voice command at all times.

An audio book for the drive is available for rent or purchase at the refuge bookstore.

Background

Merritt Island National Wildlife Refuge was established in 1963 when NASA created Kennedy Space Center. The refuge provides a buffer for space operations while also protecting key habitat such as wetland, hardwood hammock and scrub. This refuge is just one link in a chain of refuges numbering over 540 across the country that preserve habitat for wildlife. Many of these refuges are located along key migratory routes, while others preserve habitat for federally listed species. Merritt Island NWR provides both habitats for

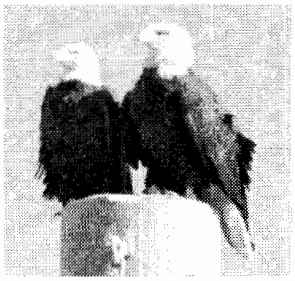
wildlife. Black Point Wildlife Drive and Cruikshank trail provide excellent viewing opportunities for migratory birds. Some of these birds are federally listed, and you may also have the chance to see other listed species such as the American alligator.

Bald Eagles Nesting

Stop 1

The Bald Eagle

What is habitat? Habitat is a list of ingredients a species needs in order to survive. Humans and wildlife need the same things for survival - food, water, shelter and space. These four items in sufficient quantity and quality create habitat. The southern bald eagle has specific habitat requirements. Bald eagles nest in tall pine trees like those to your left, and fish in wetlands and marshes like those in front of you.

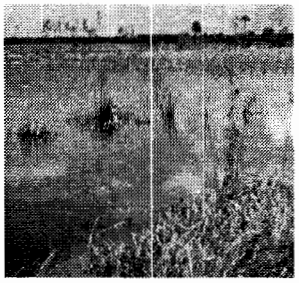


Southern Bald Eagles

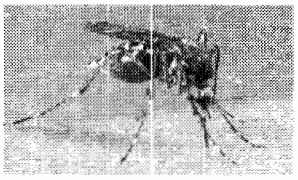
Merritt Island National Wildlife Refuge provides the quality habitat bald eagles require. The refuge manages uplands for the growth of nesting trees and the marsh for fish and waterfowl, the eagles' preferred food. Bald eagles require large plots of minimally disturbed land. Residential, agricultural and industrial development take valuable habitat away from bald eagles. Combined with pesticide use, this resulted in a frightening drop in bald eagle populations in the mid-1900's. Land conservation and restricted pesticide use over the last few decades increased bald eagle numbers, and in 1999 a proposal for the delisting of this national symbol was submitted by the U.S. Fish and Wildlife Service.

Osprey

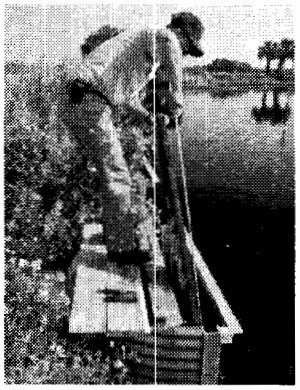
Look through the Nest Finder to spot an eagle's nest in the distance. Also look at the nesting platform to your right for perched bald eagles or osprey. Bald eagles have a white head, white tail and brown body. Osprey are smaller and have a white head with a brown eye-band, white chest, and brown tail.



Salt Marsh



Mosquito



Refuge staff use water control structures to manage habitat for wildlife.

Stop 2

Small Critters, Big Influence

Until the 1950's, salt marsh covered much of Merritt Island. The marshes were occasionally flooded by wind tides from the nearby brackish Indian River Lagoon. The fluctuating water levels of the marsh created ideal breeding habitat for the salt marsh mosquito. When NASA acquired the land that is now the refuge, local cities began to grow and an effective mosquito control program was needed. Impounding water behind a series of dikes maintained flooded conditions during peak mosquito breeding season (May - September), curtailing mosquito populations.

Maintained flooding over a number of years gradually changed the salt march habitat, like that to your left, to the more open, shallow water habitat ahead. The dikes had altered the marsh from an open system that had free exchange with the river to a closed system. While this controlled mosquito populations, it changed the marsh. Water control structures were installed to manage water levels and control mosquito populations, while also creating important habitat for migratory birds. In some areas, the marsh was restored to its natural state for fisheries management. The refuge feels all habitat types are important and strives to provide habitat for a variety of wildlife.

Salt marsh habitat is ideal for hiding. Look closely for egrets, herons and American alligators.

Stop 3

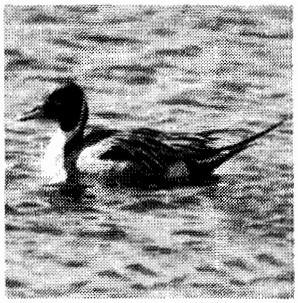
Habitat Diversity

Look in all directions from this spot - how many different types of habitat do you see? Salt marsh,

mud flats, palm hammocks and pine flatwoods in the distance combine to create habitat diversity. Habitat diversity is simply a collection of different habitat types in a small area. Habitat diversity is important because different groups of animals use each habitat.

Otter

More than 500 species of wildlife use the refuge, and while nature has provided a blueprint that is difficult to improve upon, the refuge can manage its lands and waters in ways that benefit wildlife. This may include regulating water levels to meet the needs of different fish and birds. Or it could mean using prescribed fire to open up areas of dense vegetation for feeding and nesting habitat. Using many management techniques to preserve, improve and create wildlife diversity is one of the most important tools to managing wildlife.

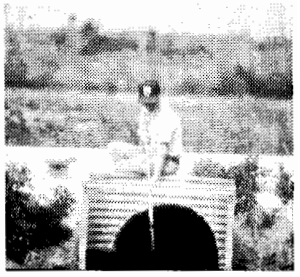


Pintail

Stop 4

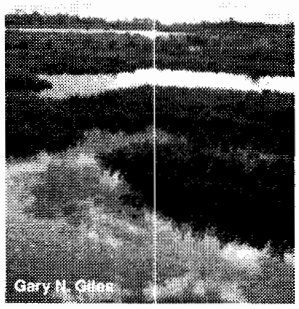
Water Level Management

By the time the refuge was established in 1963, the area around Black Point Wildlife Drive had been impounded behind a series of dikes to help control mosquito populations. These impoundments are now managed to benefit a variety of wildlife, particularly waterfowl, shorebirds and wading birds. Some impoundment water levels are kept high for species such as diving ducks, while others are kept low for shorebirds or wading birds.

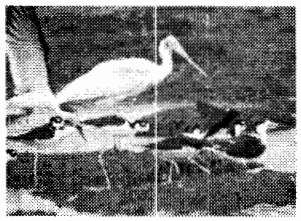


Impoundment Management

Water levels are managed by water control structures. Water control structures are pipes located in dikes that separate the impoundment from the lagoon. Boards can be installed on the ends of the pipes to hold more water in the impoundment or can be removed to drain it. Water control structures play an important role in



Refuge Impoundment


Mud Flat


Black-necked Stilt

managing our waters for wildlife. By raising and lowering water levels, we can attract certain species during certain seasons.

Wetlands provide many benefits with little cost to us. Wetlands control flooding by storing excess water and act as filters for silt and chemicals, thereby reducing pollution in our water supply.

Stop 5

Flooded Marsh

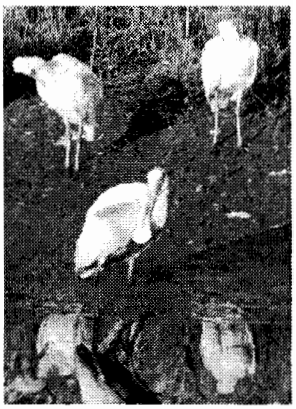
The area to your left is managed differently than those you've viewed so far. This marsh is kept open to the Indian River Lagoon year-round to allow free exchange of lagoon waters. As a result, the water levels fluctuate with the lagoon, flooding it seasonally in fall and spring creating habitat for shorebirds and wading birds. When the water recedes, it creates mud flats suitable for shorebirds. This naturally fluctuating marsh provides diversity and attracts different species of wildlife.

Stop 6

Mud Flat Cafe

Thousands of people migrate to Florida every winter from the northern chill to soak up Florida's warm sun and clear skies. Some folks come for a brief visit, while others spend the entire winter here. But another population boom occurs here every year as well. That is the migration into Florida of thousands of shorebirds, wading birds, raptors and songbirds. Some species use the area as a rest stop on their way further south for their winter stay, while others winter here before returning north in the spring to breed. The refuge serves as the perfect place to stock up on food and rest for both migratory bird visitors.

The mud flats to your left provide optimum habitat for shorebirds, as it is teaming with various worms, clams, snails and crabs buried underneath a blanket of moist mud that provides a smorgasbord of food. Most shorebirds feed by sense of touch, using their sensitive bills to probe for and gather food. Overhead, you can also spot gulls, terns, skimmers and kingfishers scoping the area for fish stranded in isolated water pockets.



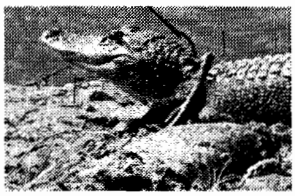
Roseate Spoonbills

Stop 7

Food Chain Interactions

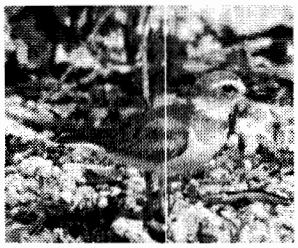
Water level management is an important factor in managing the refuge for wildlife. The impoundment to your right is managed at a water depth of 2 - 18 inches, which benefits the widest range of species. Hidden within this impoundment is an intricate food chain that supports this system. Sunlight creates the base of the chain, penetrating the shallow water, allowing submerged plants to flourish. These plants provide food for waterfowl and habitat for fish and other aquatic species. Micro-organisms feed and grow on the plants, that are in turn grazed on by one-celled animals, which are eaten by shrimp, small fish, crabs and others. These become food for larger fish that are finally eaten by animals at the top of the food chain like wading birds, raptors, alligators and man.

Great Egret



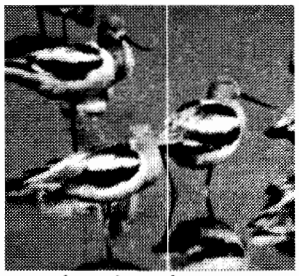
American Alligator

Refuge biologists keep water levels in some impoundments high, some low, some salty and some fresh. At times, water levels are either drawn down or raised to provide habitat for a certain species. This management system keeps impoundments productive by providing food, water and shelter for thousands of species in this food web.



Semi-palmated Plover

Blue-winged Teal



American Avocets

Stop 8

Seasonal Rhythms

Each winter, thousands of waterfowl fill the Florida sky and gracefully set down at Merritt Island National Wildlife Refuge. Many of these birds have traveled thousands of miles from the tundra of Alaska and Canada to arrive at these wintering grounds, where they feed and rest until their journey north again in spring. The U.S. Fish and Wildlife Service has established a chain of National Wildlife Refuges along historic migratory routes in the United States. These refuges provide feeding areas, rest stops and over-wintering grounds for the millions of waterfowl, marsh birds, shorebirds, raptors and songbirds that migrate every year using these important skyways.

This refuge is a key wintering area in Florida, supporting winter populations of 50,000-70,000 puddle ducks, 70,000 - 200,000 diving ducks, 100,000 coots, 12,000-14,000 gulls and terns, 2,000 raptors and an enormous number of songbirds. Winter is the best time to visit. Look for migratory arrivals as early as September, with peak populations occurring in January or February. The migration north usually begins in March, but varies for different species.

Stop 9

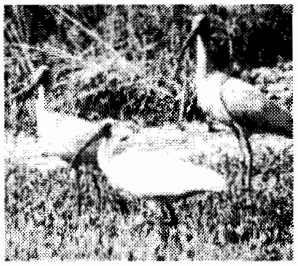
Cruikshank Trail

Allan D. Cruikshank was a famous wildlife photographer, writer and naturalist who was instrumental in the establishment of Merritt Island National Wildlife Refuge. As a bird enthusiast, he visited the area often. Park in the lot provided and walk all or part of the five mile trail established in his honor. An observation tower is located a few

minutes from the parking lot for wildlife viewing and photographic opportunities.

In winter, look for roseate spoonbills, white pelicans, wood storks, white ibis, blue-winged teal, or pintail. In spring and summer, look for tri-colored herons, great egrets, white ibis, black-necked stilts, anhingas, or kingfishers. Frequent sightings include American alligators, river otters, turtles and snakes.

Please use caution when walking this trail - take plenty of water with you as well as insect repellent, sunscreen, and rain gear. Alligators frequent this area and may be seen sunning themselves close by. Please do not feed or approach them.



White Ibis

Wood Storks

Wetland Meets Uplands

Stop 10

Restored Marsh

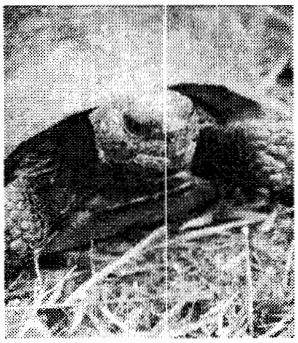
The grassland to your left is probably what the area around Black Point looked like before mosquito control. In 1969, the refuge began removing some dikes on the refuge to restore the natural salt marsh. Today, this marsh serves its natural purpose - acting as a filter for coastal waters, absorbing wave energy from storms and protecting the upland. Preserving and managing natural habitat is an objective for the National Wildlife Refuge System.

Stop 11

On the Edge

As you drive, you'll notice the wetlands in front of you meeting patches of pine trees in the distance. The area where two different habitats meet is called an edge, or ecotone. Many species inhabit these areas because they can use more than one type

Black-necked Stilt Nesting



Gopher Tortoise

Prescribed Fire

of habitat without traveling long distances. Some habitats provide cover, while others provide feeding grounds or nesting sites. For instance pine flatwood habitat provides bald eagles with a place to perch or nest, while adjacent water pockets provide a place to hunt prey. This patchwork quilt of edges contributes to the 500 species of wildlife the refuge supports. Each habitat provides a different value and function for different species.

As you travel from stop 11 to stop 12, you'll notice a habitat transition from marshes to uplands. Different habitats require different management styles. Marshes are managed primarily by seasonally varying impoundment water levels. Can you guess what technique the refuge uses to manage the uplands ahead of you?

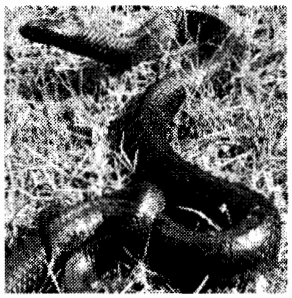
Stop 12

Fire as a Management Tool

Refuge uplands are principally managed with prescribed fire, also called controlled burning. A prescribed fire is deliberately set by habitat managers to attain planned resource management objectives. For the last portion of the drive, you'll pass four fire units on your left. These units are rotationally burned every year to provide habitat diversity for wildlife species such as bald eagles, indigo snakes, and gopher tortoises.

Many think of fire as an unwanted destructive force, but in Florida ecosystems, fire is necessary for the continued survival of many plant and animal species. Some plants depend on and grow best under conditions created by fire - an open area with abundant sunlight, increased nutrients in the soil and reduced litter on the forest floor. Fire also releases nutrients and minerals into the soil that's

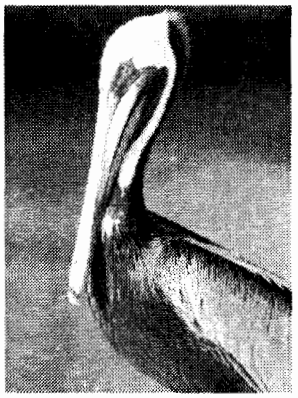
recycled back into new native plant growth. Without fire in the ecosystem, accumulated ground litter, or fuel, would create volatile conditions favorable to wildfires, much more destructive and unpredictable than prescribed fires. This is particularly important around areas such as Kennedy Space Center, where protection of buildings, facilities and personnel is paramount.



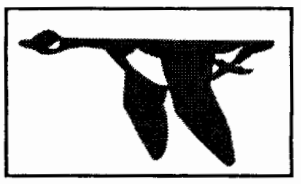
Eastern Indigo Snake

National Wildlife Refuge System

The National Wildlife Refuge System celebrated its 100th birthday in 2003. Created from the tiny five-acre Pelican Island on Florida's east coast, the System now encompasses over 540 refuges on over 95 million acres of land and is administered by the U.S. Fish and Wildlife Service within the Department of the Interior. National Wildlife Refuges are places where wildlife come first, and the lands are managed to conserve and restore fish and wildlife habitat. Consequently, many refuges are established to benefit threatened and endangered species. More than 700 species of birds call refuges home, millions of them using refuges as stepping stones to rest as they migrate thousands of miles south for the winter and return north for the summer. Many refuges, like Merritt Island, are also places for the public to enjoy wildlife and wild places through hunting, fishing, photography and educational opportunities.

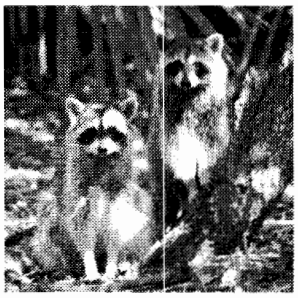


Brown Pelican



This blue goose, designed by J.N. "Ding" Darling, has become a symbol of the National Wildlife Refuge System.

Florida Manatees

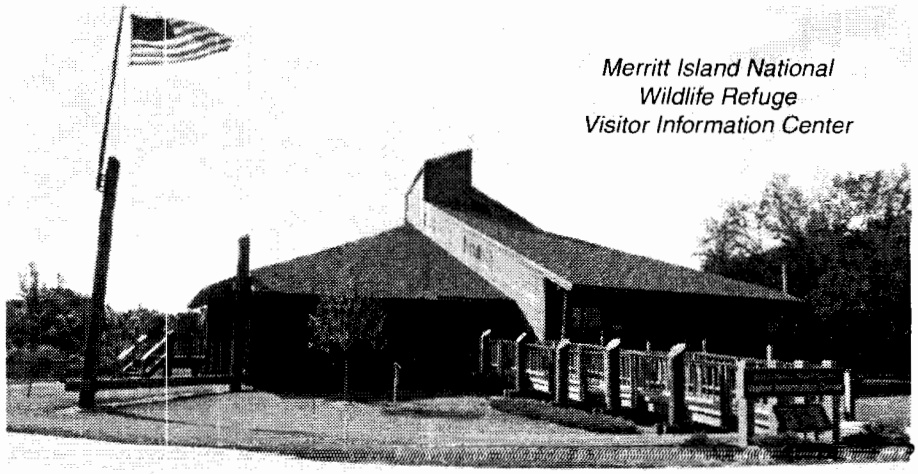


Racoons

Thanks for visiting

Thank you for visiting Merritt Island National Wildlife Refuge's Black Point Wildlife Drive. Through conservation and careful management, the refuge has remained a good place for wildlife to live. Whether through controlled burning, managing water levels or merely planting native species, we seek to insure quality habitat will always be available for wildlife and for you and future generations of Americans to enjoy.

You are welcome to take this trail guide with you or you may recycle it by returning it to the brochure box located at the end of the drive. There are many other wildlife recreation opportunities available on the refuge such as trails, a manatee observation deck, fishing and hunting. Please stop by the Visitor Information Center for more information. The Center provides interpretive exhibits, a refuge video, sales area, bookstore, and a 1/4 mile boardwalk. The Center is open from 8am - 4:30pm Monday - Friday and 9am - 5pm on weekends. The Center is closed Sundays from April - October. The Center is located 5 miles east of US1 in Titusville on SR402.
321/861-0667 or **http://merrittisland.fws.gov.**

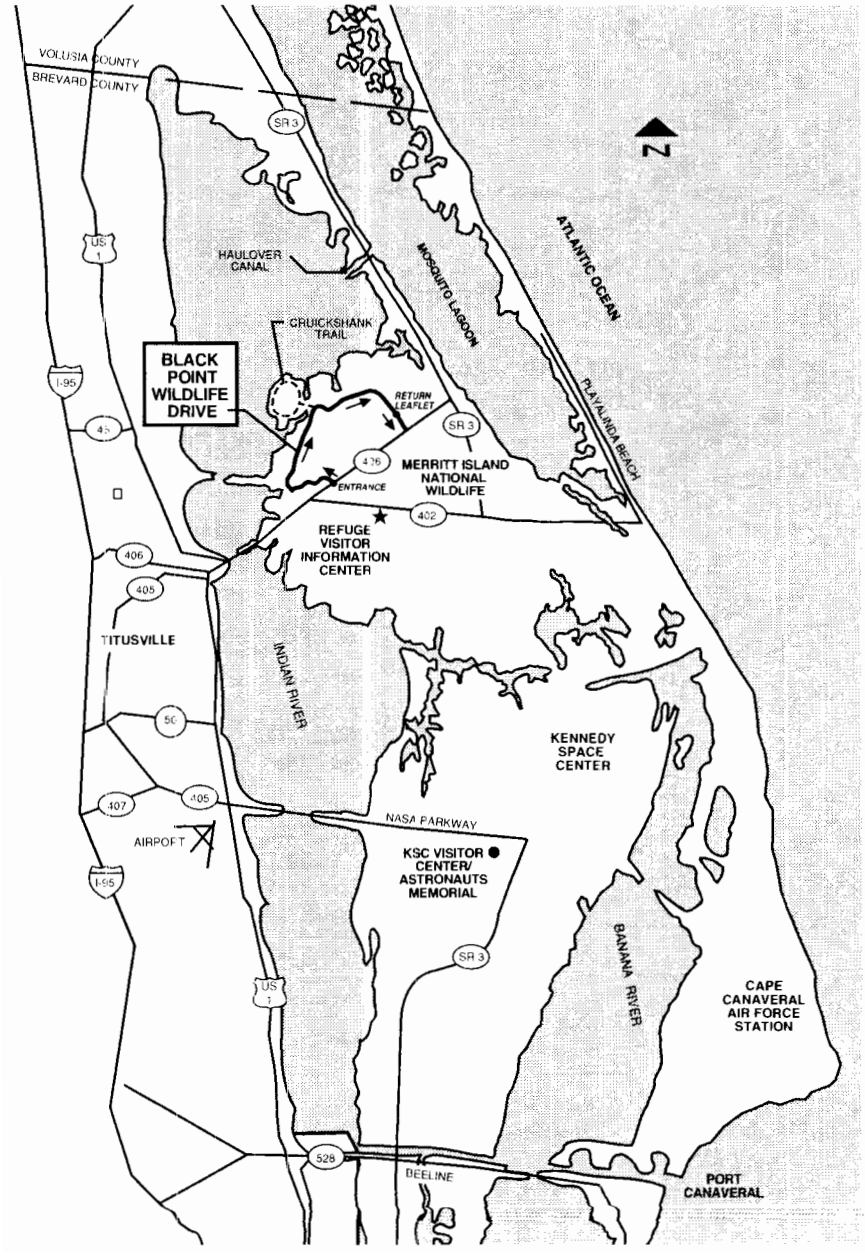


Merritt Island National Wildlife Refuge Visitor Information Center

Black Point Wildlife Drive

Merritt Island National Wildlife Refuge

Some areas of the refuge may be closed to public access. Please call for more information at 321/861-0667.



Attachment 3 – Viera Wetlands

Appendix List

1. Viera Wetlands Map (Reference1)
2. Bird & Wildlife Species Checklist (Reference 2)

References

1. The Brevard County South Central Wetland map is provided by the Brevard County Water Resources Department and available at the following site: http://countygovt.brevard.fl.us/usd/documents/Wetlands%20Map.pdf and http://countygovt.brevard.fl.us/usd/documents/Wetlands%20Brochure.pdf. These maps are included with this site guide for information only.

2. Brevard County's Natural Resources Management Office, Bird & Wildlife Species Checklist.

3. Annotated map images used in the site guide provided by USGS at http://terraserver.microsoft.com/. From the TerraServer website FAQ: The images are from the U.S. Geological Survey, and are freely available for you to download, use and re-distribute. The TerraServer team and the USGS appreciate credit for their work on this project by displaying the message "Image courtesy of the USGS".

ANIMAL SPECIES CHECKLIST

Birds:

_____ Bald Eagle
_____ Great Blue Heron
_____ Crested Caracara
_____ Snowy Egret
_____ Great Egret
_____ Little Blue Heron
_____ Green Heron
_____ Blue-Winged Teal
_____ Mottled Duck
_____ Common Coot
_____ Marsh Hen

Reptiles:

Alligators:
_____ American Alligator

Turtles:
_____ Peninsula Cooter
_____ Florida Cooter
_____ Florida Red-Bellied Turtle
_____ Smooth Softshell Turtle

Snakes:
_____ Florida Water Snake
_____ Florida Cottonmouth
_____ Red Rat Snake
_____ Yellow Rat Snake
_____ Southern Black Racer

Lizards:
_____ Green Anole
_____ Brown Anole

Toads:
_____ Southern Toad

Frogs:
_____ Bullfrog
_____ Pig Frog
_____ Green Tree Frog
_____ Squirrel Tree Frog
_____ Southern Leopard Frog

Mammals:

_____ River Otter
_____ Virginia Opossom
_____ Nine Banded Armadillo
_____ Raccoon
_____ White Tail Deer
_____ Wild Hog
_____ Marsh Rabbit

RULES AND REGULATIONS

- Please sign in at the Plant Office before entering the site.
- The wetland site is closed between dusk and 7 AM.
- Vehicle Speed Limit is 15 MPH.
- Please keep your vehicle on the improved roadway.
- Do not overtake other vehicles along the roadway.
- Please do not block the roadway.
- Vehicles and bicycles are allowed on the Berm Trail.
- The Berm Trail may be closed to vehicles following heavy rains or for other reasons.
- Firearms, fireworks, fires and alcoholic beverages are prohibited.
- Hunting, fishing, boating, wading and swimming are prohibited.
- Please stay off the Water Control Structures and Pipes.
- Please do not feed the wildlife.
- Harassing the wildlife is prohibited.
- Please keep pets on a leash.
- Please do not litter.

FOR YOUR SAFETY

Please return to the safety of your car if lightning should appear or thunder can be heard. The Observation Decks are closed when thunderstorms are in the area.

PRESERVE WATCH

The Brevard County Water Resources Department strives to keep the Wetland clean and beautiful. However, some park users do violate these rules. Help us protect the wetlands and environment by reporting any abusers to (321)255-4328 in the case of a serious offense.

WETLAND MANAGMENT

THE BREVARD COUNTY SOUTH CENTRAL WETLAND IS MAINTAINED BY THE BREVARD COUNTY WATER RESOURCES DEPARTMENT.

PLANT TOURS CAN BE SCHEDULED WITH THE PLANT SUPERVISOR UPON REQUEST.

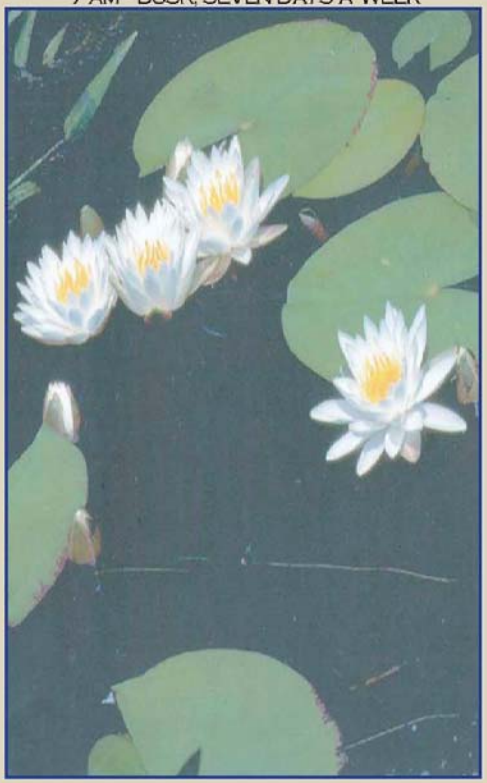
FOR QUESTIONS, COMMENTS OR PROBLEMS PLEASE CONTACT US AT
(321) 255-4328
WWW.BREVARDCOUNTY.US/WATER RESOURCES

BREVARD COUNTY SOUTH CENTRAL WETLAND

BREVARD COUNTY, FLORIDA

WETLAND MAP AND TRAIL SYSTEM

PARK HOURS:
7 AM - DUSK, SEVEN DAYS A WEEK



Appendix 1 - Viera Wetlands Map

BREVARD COUNTY
SOUTH CENTRAL WETLAND
BREVARD COUNTY, FLORIDA
WETLANDS MAP AND TRAIL SYSTEM

PARK HOURS:
7 AM - DUSK, SEVEN DAYS A WEEK

Plant Species Checklist

Lake Plantings
_____ Sawgrass
_____ Buttonbush
_____ Pickerelweed
_____ Spikerush
_____ Spatterdock
_____ Fragrant Water Lily
_____ Cordgrass
_____ Softrush

Cells 1 and 2
_____ Fragrant Water Lily
_____ Giant Bulrush
_____ Spatterdock
_____ Soft Stem Bulrush

Cells 3 and 4
_____ Arrowhead
_____ Blue Flag
_____ Bushy Pondweed
_____ Coontail
_____ Duck Potato
_____ Fire Flag
_____ Pickerelweed
_____ Sawgrass
_____ Spikerush
_____ Soft-Stem Bulrush
_____ Wild Rice

Trees and Shrubs
_____ Bald Cypress
_____ Buttonbush
_____ Carolina Ash
_____ Coco Plum
_____ Dahoon Holly
_____ Hackberry
_____ Leather Fern
_____ Loblolly Bay
_____ Red Cedar
_____ Red Maple
_____ Royal Fern
_____ Pond Apple
_____ Pond Pine
_____ Slash Pine
_____ Swamp Tupelo
_____ Sweet Bay
_____ Wild Coffee

Appendix 2

Birds		1	2	3	4	5	6	7	8	9	10	11	12
Common Name	***Scientific Name***	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
GREBES													
Horned Grebe	*Podiceps auritus*											x	x
Eared Grebe	*Podiceps nigricollis*	x	x										x
Pied-billed Grebe	*Podilymbus podiceps*	x	x	x	x	x	x	x	x	x	x	x	x
PELICANS, CORMORANTS, ANHINGA													
Anhinga	*Anhinga anhinga*	x	x	x	x	x	x	x	x	x	x	x	x
Brown Pelican	*Pelecanus occidentalis*	x											x
White Pelican	*Pelecanus eryrohynchos*	x			x		x	x	x				
Double-crested Cormorant	*Phalacrocorax auritus*	x	x	x	x	x	x	x	x	x	x	x	x
HERONS, EGRETS, BITTERNS, IBIS, SPOONBILL, STORK, VULTURES													
Roseate Spoonbill	*Ajaia ajaja*			x		x	x	x	x	x	x	x	x
Great Egret	*Ardea alba*	x	x	x	x	x	x	x	x	x	x	x	x
Great Blue Heron	*Ardea herodias*	x	x	x	x	x	x	x	x	x	x	x	x
American Bittern	*Botaurus lentiginosus*	x	x	x	x	x	x	x	x	x	x	x	x
Cattle Egret	*Bubulcus ibis*	x	x	x	x	x	x	x	x			x	x
Green Heron	*Butorides virescens*	x	x	x	x	x	x	x	x	x	x	x	x
Turkey Vulture	*Cathartes aura*	x	x	x	x	x	x	x	x	x	x	x	x
Black Vulture	*Coragyps atratus*	x	x	x	x	x	x	x	x	x	x	x	x
Little Blue Heron	*Egretta caerulea*	x	x	x	x	x	x	x	x	x	x	x	x
Reddish Egret	*Egretta rufescens*											x	
Snowy Egret	*Egretta thula*	x	x	x	x	x	x	x	x	x	x	x	x
Tricolored Heron	*Egretta tricolor*	x	x	x	x		x	x	x	x	x	x	x
White Ibis	*Eudocimus albus*	x	x	x	x	x	x	x	x	x	x	x	x
Scarlet Ibis	*Eudocimus ruber*	x											
Least Bittern	*Ixobrychus exilis*	x	x	x	x	x	x	x	x	x	x	x	x
Wood Stork	*Mycteria americana*	x	x	x	x	x	x	x	x	x	x	x	x
Yellow-crowned Night-Heron	*Nyctanassa violacea*		x						x				
Black-crowned Night-Heron	*Nycticorax nycticorax*	x	x	x	x	x	x	x	x	x	x		x
White-faced Ibis (unverified)	*Plegadis chihi*					x							
Glossy Ibis	*Plegadis falcinellus*	x	x	x	x	x	x	x	x	x	x	x	x
DUCKS, GEESE, SWAN													
Wood Duck	*Aix sponsa*	x										x	x
Northern Pintail	*Anas acuta*	x	x									x	
American Wigeon	*Anas americana*	x	x									x	x
Northern Shoveler	*Anas clypeata*	x	x	x						x	x	x	x
Green-winged Teal	*Anas crecca*	x	x							x		x	x
Cinnamon Teal	*Anas cyanoptera*	x								x	x		
Blue-winged Teal	*Anas discors*	x	x	x	x	x	x	x	x	x	x	x	x
Mottled Duck	*Anas fulvigula*	x	x	x		x	x	x	x	x	x	x	x
Mallard Duck	*Anas plalyrhynchos*	x		x	x	x	x	x	x	x	x	x	x
Gadwall	*Anas strepera*		x									x	
Greater White-fronted Goose	*Anser albifrons*					x						x	
Lesser Scaup	*Aythya affinis*	x	x									x	x
Redhead Duck	*Aythya americana*	x										x	x
Ring-necked Duck	*Aythya collaris*	x	x	x	x	x	x	x	x		x	x	x
Greater Scaup	*Aythya marila*				x								
Canvasback Duck	*Aythya valisineria*	x										x	x
Canada Goose	*Branta canadensis*	x	x										
Bufflehead	*Bucephala albeola*	x											x
Snow Goose (blue phase)	*Chen caerulescens*	x										x	x
Black-bellied Whistling-Duck	*Dendrocygna autumnalis*			x	x	x	x	x	x	x	x	x	x
Fulvous Whistling-Duck	*Dendrocygna bicolor*						x	x				x	
Hooded Merganser	*Lophodytes cucullatus*	x	x	x			x					x	x
Black Scoter	*Melanitta nigra*	x		x									
Red-breasted Merganser	*Mergus serrator*			x	x							x	
Masked Duck	*Nomonyx dominicus*			x								x	
Ruddy Duck	*Oxyura jamaicensis*	x						x	x		x	x	x
HAWKS, KITES, EAGLE, FALCONS													
Cooper's Hawk	*Accipiter cooperii*											x	x
Sharp-shinned Hawk	*Accipiter striatus*											x	
Red-tailed Hawk	*Buteo jamaicensis*	x	x		x	x				x	x	x	x
Red-shouldered Hawk	*Buteo lineatus*	x	x	x	x	x	x	x	x	x	x	x	x

Birds		1	2	3	4	5	6	7	8	9	10	11	12
Common Name	***Scientific Name***	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
HAWKS, KITES, EAGLE, FALCONS													
Broad-winged Hawk	*Buteo platypterus*	x						x			x	x	x
Crested Caracara	*Carcara plancus audubonii*	x	x	x	x	x	x	x	x	x	x	x	x
Northern Harrier	*Circus cyaneus*	x	x	x	x					x	x	x	x
Swallow-tailed Kite	*Elanoides forficatus*					x	x		x	x			
Merlin	*Falco columbarius*	x	x	x						x		x	x
Peregrine Falcon	*Falco peregrinus*	x								x	x	x	x
American Kestrel	*Falco sparverius*	x	x	x	x	x			x		x	x	x
Bald Eagle	*Haliaeetus leucocephalus*	x	x	x	x	x	x		x	x	x	x	x
Osprey	*Pandion haliaetus*	x	x	x	x	x	x	x	x	x	x	x	x
Snail Kite	*Rostrhamus sociabilis*							x				x	
					x								
TURKEY, BOBWHITE, PHEASANT													
Northern Bobwhite	*Colinus virginianus*			x		x	x	x	x				
White Pheasant (blue-eyed)	*Phasianus colchicus*				x	x	x	x					
RAILS, GALLINULES, COOTS, LIMPKIN, CRANES													
Limpkin	*Aramus guarauna*	x		x	x	x	x	x	x	x	x	x	x
American Coot	*Fulica americana*	x	x	x	x	x	x	x	x	x	x	x	x
Common Moorhen	*Gallinula chloropus*	x	x	x	x	x	x	x	x	x	x	x	x
Sandhill Crane	*Grus canadensis*	x	x	x	x	x	x	x	x	x	x	x	x
Purple Gallinule	*Porphyrula martinica*	x		x	x	x	x	x	x	x	x		x
Sora	*Porzana carolina*		x									x	
King Rail	*Rallus elegans*										x		
Virginia Rail	*Rallus limicola*											x	
PLOVERS, OYSTERCATCHER, STILT, AVOCET, SANDPIPERS													
Spotted Sandpiper	*Actitis macularia*				x	x	x	x		x		x	
Upland Sandpiper	*Bartramia longicauda*								x	x			
Least Sandpiper	*Calidris minuitilla*	x	x	x	x	x	x	x	x			x	x
Sanderling	*Calidris alba*				x	x	x		x	x			x
Dunlin	*Calidris alpina*						x						
Red Knot	*Calidris canutus*										x		
White-rumped Sandpiper	*Calidris fuscicollis*					x	x			x			
Stilt Sandpiper	*Calidris himantopus*		x			x				x			
Western Sandpiper	*Calidris mauri*		x		x	x		x	x				
Pectoral Sandpiper	*Calidris melanotos*							x	x	x	x		
Semipalmated Sandpiper	*Calidris pusilla*					x	x	x	x				
Willet	*Catoptrophorus semipalmatus*								x			x	
Semipalmated Plover	*Charadrius semipalmatus*		x			x	x					x	
Killdeer	*Charadrius vociferus*	x	x	x	x	x	x	x	x	x	x		x
Common Snipe	*Gallinago gallinago*	x	x	x	x	x					x	x	x
Black-necked Stilt	*Himantopus mexicanus*	x	x	x	x	x	x	x	x	x		x	x
Short-billed Dowitcher	*Limnodromus griseus*							x					
Long-billed Dowitcher	*Limnodromus scolopaceus*	x	x				x	x	x	x	x	x	x
Whimbrel	*Numenius phaeopus*								x				
Wilson's Phalarope	*Phalaropus tricolor*								x	x	x		
American Golden Plover	*Pluvialis dominica*								x	x	x	x	x
Black-bellied Plover	*Pluvialis squatarola*	x					x		x	x		x	x
American Avocet	*Recurvirostra americana*											x	x
Lesser Yellowlegs	*Tringa flavipes*	x		x		x	x	x	x	x		x	x
Greater Yellowlegs	*Tringa melanoleuca*	x	x	x	x	x	x	x	x	x		x	x
Solitary Sandpiper	*Tringa solitaria*		x		x	x				x			
Buff-breasted Sandpiper	*Tryngites subruficollis*									x	x		
JAEGERS, GULLS, TERNS, SKIMMERS													
Black Tern	*Chlidonias niger*				x	x	x	x	x	x	x		
Bonaparte's Gull	*Larus philadelphia*	x	x			x	x					x	x
Bridled Tern	*Sterna anaethetus*									x			
Least Tern	*Sterna antillarum*				x	x	x	x					
Caspian Tern	*Sterna caspia*				x						x	x	

X – Documented sightings by MONTH

Species with ALL blank months have been recorded in the wetlands as presence/absence.

Birds		1	2	3	4	5	6	7	8	9	10	11	12
Common Name	***Scientific Name***	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
JAEGERS, GULLS, TERNS, SKIMMERS - continued													
Gull-billed Tern	*Sterna nilotica*	x	x	x		x	x			x	x		x
Sandwich Tern	*Sterna sandvicensis*								x	x	x		
DOVES													
Rock Dove	*Columba livia*												
Common Ground-Dove	*Columbina passerina*				x	x		x					
Eurasian Collared-Dove	*Streptopelia decaocto*				x	x	x	x	x	x	x		
White-winged Dove	*Zenaida asiatica*												
Mourning Dove	*Zenaida macroura*	x	x	x	x	x		x	x	x	x	x	x
OWLS													
Great Horned Owl	*Bubo virginianus*	x					x	x				x	x
Barred Owl	*Strix varia*			x	x	x	x	x	x	x	x		
NIGHTHAWKS, NIGHTJARS													
Common Nighthawk	*Chordeiles minor*						x	x	x				
SWIFTS													
Chimney Swift	*Chaetura pelagica*												
HUMMINGBIRDS													
Rufous Hummingbird	*Selasphorus rufus*												
KINGFISHER													
Belted Kingfisher	*Ceryle alcyon*	x	x	x	x	x			x	x	x	x	x
WOODPECKERS													
Common Flicker	*Colaptes auratus*												
Pileated Woodpecker	*Dryocopus pileatus*						x						
Red-bellied Woodpecker	*Melanerpes carolinus*	x	x	x	x	x	x	x	x	x	x	x	x
Downy Woodpecker	*Picoides pubescens*												
Hairy Woodpecker	*Picoides villosus*												
Yellow-bellied Sapsucker	*Sphyrapicus varius*	x											
FLYCATCHERS													
Eastern Phoebe	*Sayornis phoebe*	x											x
Gray Kingbird	*Tyrannus dominicensis*	x											x
Eastern Kingbird	*Tyrannus tyrannus*	x		x							x	x	x
SHRIKE													
Loggerhead Shrike	*Lanius ludovicianus*	x	x	x	x	x	x	x	x	x	x	x	x
JAYS, CROWS													
American Crow	*Corvus brachyrhynchos*	x	x	x		x	x	x	x	x	x	x	
Fish Crow	*Corvus ossifragus*			x		x	x	x	x	x			
Blue Jay	*Cyanocitta cristata*						x						
SWALLOWS													
Cave Swallow (Mexican)	*Hirundo fulva*								x	x		x	x
Cliff Swallow	*Hirundo pyrrhonota*								x				
Barn Swallow	*Hirundo rustica*					x	x			x		x	
Purple Martin	*Progne subis*	x		x	x	x	x	x	x	x			
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*											x	
Mangrove Swallow	*Tachycineta albilinea*											x	x
Tree Swallow	*Tachycineta bicolor*	x	x	x	x	x	x		x	x	x	x	x
WRENS													
Marsh Wren (unverified)	*Cistothorus palustris*										x		
Carolina Wren	*Thryothorus ludovicianus*												

Updated 11/28/06

Continued on back

Birds		1	2	3	4	5	6	7	8	9	10	11	12
Common Name	***Scientific Name***	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
THRUSHES													
American Robin	*Turdus migratorius*	x	x	x	x								x
THRASHERS, MOCKINGBIRDS, CATBIRDS													
Gray Catbird	*Dumetella carolinensis*												
Northern Mockingbird	*Mimus polyglottos*	x	x	x	x	x	x	x	x	x	x	x	x
Brown Thrasher	*Toxostoma rufum*												
PIPIT													
American Pipit	*Anthus rubescens*		x									x	x
WOOD WARBLERS													
Yellow-rumped Warbler	*Dendroica coronata*	x	x										
Palm Warbler	*Dendroica palmarum*	x	x							x	x	x	x
Common Yellowthroat	*Geothlypis trichas*	x	x										
TOWHEE, SPARROWS													
Lark Sparrow	*Chondestes grammacus*									x		x	
Swamp Sparrow	*Melospiza georgiana*												
Savannah Sparrow	*Passerculus sandwichensis*	x	x	x							x	x	x
Vesper Sparrow	*Pooecetes gramineus*	x		x									
CARDINALS													
Northern Cardinal	*Cardinalis cardinalis*					x		x				x	
BOBOLINK, BLACKBIRDS, GRACKLES, COWBIRDS, ORIOLES													
Red-winged Blackbird	*Agelaius phoeniceus*	x		x	x	x	x	x	x	x		x	x
Bobolink	*Dolichonyx oryzivorus*			x	x	x				x			
Brown-headed Cowbird	*Molothrus ater*					x	x	x	x	x			
Boat-tailed Grackle (brown)	*Quiscalus major*	x	x	x	x	x	x	x	x	x	x	x	x
Common Grackle	*Quiscalus quiscula*	x		x	x	x	x	x		x	x		x
Eastern Meadowlark	*Sturnella magna*	x	x	x	x	x	x	x	x	x	x	x	x
EXOTICS													
White-cheeked Pintail	*Anas bahamensis*							x	x				
Monk Parakeet	*Myiopsitta monachus*				x	x							
European Starling	*Sturnus vulgaris*		x	x	x	x		x					

Reptiles & Amphibians		1	2	3	4	5	6	7	8	9	10	11	12
Common Name	***Scientific Name***	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
ALLIGATORS													
American Alligator	*Alligator mississippiensis*	x	x	x	x	x	x	x	x	x	x	x	x
AMPHIBIANS													
Bull Frog	*Rana catesbeiana*				x	x	x	x	x	x	x	x	
Cuban Tree Frog	*Osteopilus septentrionalis*					x	x	x				x	x
Florida Leopard Frog (Southern)	*Rana utricularia sphenocephala*	x	x		x	x	x	x	x	x	x	x	x
Green Tree Frog	*Hyla cinerea*	x	x	x	x	x	x		x	x	x	x	
Little Grass Frog	*Pseudacris ocularis*								x	x			
Pig Frog	*Rana grylio*			x	x	x	x	x	x	x	x	x	x
Squirrel Tree Frog	*Hyla squirella*	x	x	x	x		x		x	x	x	x	x
LIZARDS													
Brown Anole	*Anolis sagrei*	x	x	x	x	x	x	x	x	x	x	x	x
Green Anole	*Anolis carolinensis*	x	x	x	x	x	x	x	x	x	x	x	x
SKINKS													
Ground Skink	*Scincella lateralis*										x		
SNAKES													
Banded Water Snake	*Nerodia fasciata fasciata*	x		x	x	x	x				x	x	x
Bluestripe Garter Snake	*Thamnophis sirtalis similis*						x						
Corn Snake (orange, red phases)	*Elaphe guttata guttata*	x					x	x					x
Eastern Diamondback Rattlesnake	*Catenatus adamanteus*			x	x		x						
Eastern Garter Snake	*Thamnophis sirtalis sirtalis*	x			x	x		x			x	x	x
Florida Cottonmouth	*Agkistrodon piscivorus conanti*	x		x	x	x		x					x
Florida Water Snake	*Nerodia fasciata pictiventris*	x		x	x	x	x	x	x			x	x
Peninsula Ribbon Snake	*Thamnophis sauritus sackenii*	x		x			x	x	x		x	x	x
Pygmy Rattlesnake (dusky)	*Sistrurus miliarius barbouri*			x									
Southern Black Racer	*Coluber constrictor priapus*	x		x	x	x	x	x	x	x	x	x	x
Yellow Rat Snake	*Elaphe obsoleta quadrivittata*					x	x						
TURTLES													
Florida Box Turtle	*Terrapene carolina bauri*	x					x						
Florida Cooter	*Pseudemys floridana floridana*	x	x	x	x						x	x	x
Florida Redbelly Turtle	*Pseudemys nelsoni*			x	x	x	x	x	x	x	x	x	x
Florida Snapping Turtle	*Chelydra serpentina*					x							
Florida Soft-shelled Turtle	*Apalone ferox*			x	x	x	x	x	x	x	x	x	x
Striped Mud Turtle	*Kinosternon baurii*			x	x		x						
Loggerhead Musk Turtle	*Sternotherus minor minor*				x								
Peninsula Cooter	*Pseudemys floridana peninsularis*		x	x								x	
FISH													
Banded Topminnow	*Fundulus diaphanous*				x		x				x		
Blue Tilapia	*Oreochromis aureus*				x	x	x						
Bluefin Killifish	*Lucania goodei*			x	x	x	x						
Bluegill Sunfish	*Lepomis macrochirus*	x	x	x	x	x	x	x	x	x	x	x	x
Bowfin	*Amia calva*						x	x					
Brown Hoplo Catfish	*Hoplosternum littorale*	x	x	x	x	x	x						
Dollar Sunfish	*Lepomis marginatus*					x	x		x	x	x		
Flag Fish	*Jordanella floridae*	x			x	x	x		x	x	x	x	x
Golden Topminnow	*Fundulus chrysotus*					x	x	x	x		x		
Ironcolor Shiner	*Notropis chalybasus*	x	x	x	x	x	x	x	x	x	x		x
Least Killifish	*Heterandria formosa*	x	x	x	x	x	x	x	x	x	x	x	x
Mosquito Fish	*Gambusia affinis*	x	x	x	x	x	x	x	x	x	x	x	x
Sailfin Molly	*Poecilia latifinna*	x	x	x	x	x	x	x	x	x	x	x	x
Seminole Killifish	*Fundulus seminolis*				x	x	x	x	x	x			
Sheepshead Minnow	*Cyprinodon variegatus*	x										x	x
MAMMALS													
Black Bear	*Ursus americanus*			x						x			
Bobcat	*Felis rufus*						x	x			x		x
Coyote	*Canis latrans*							x		x	x		
Eastern Cottontail Rabbit	*Sylvilagus floridanus*	x		x	x	x	x	x	x	x	x	x	x
Marsh Rabbit	*Sylvilagus palustris*					x							
Nine-banded Armadillo	*Dasypus novemcinctus*	x	x	x	x	x	x	x	x	x	x	x	x
Opossum	*Didelphis marsupialis*				x	x	x						
Raccoon	*Procyon lotor*	x		x	x	x		x		x	x	x	x
River Otter	*Lutra canadensis*	x	x	x	x	x	x	x	x		x		x
White-tailed Deer	*Odocoileus virginianus*	x	x		x	x	x	x	x	x	x	x	x

BREVARD COUNTY
SOUTH CENTRAL WASTEWATER RECLAMATION SYSTEM

VIERA WETLANDS

BREVARD COUNTY, FLORIDA

BIRD and WILDLIFE CHECKLIST

WINTER 2007

Attachment 4 – Canaveral National Seashore

Park Info and Links

National Park Service Website: http://www.nps.gov/cana/

Operating Hours & Seasons

Park Hours
- Winter: 6:00 am to 6:00 pm (Nov - Mar)
- Summer: 6:00 am to 8:00 pm (Apr - Oct)

* Winter hours in effect Oct 29, 2006 through March 10, 2007

Visitor Center Hours (at Apollo Beach north entrance.)
No visitor center on Playalinda Beach south entrance.

- 9:00 am to 5:00 pm
- Open all year except Christmas Day

Eldora Statehouse - Please call the Visitor Information Center at (386) 428-3384 x10 for current hours of operation.

Seminole Rest - Please call the Visitor Information Center at (386) 428-3384 x10 for current hours of operation.

The park generally closes 3 days prior to a Space Shuttle launch and one day before a Shuttle landing so call ahead to check operational hours.

Park Fees

- Daily Use Fee: $3.00 per person (children under age 16 are admitted free)
- Annual Park Pass: $35.00
- Individuals on foot or bicycle; $3.00 per day

National Parks and Golden Eagle passes accepted. The new "America The Beautiful - National Parks and Federal Recreational Lands Pass" interagency recreation passes are now available at federal recreation sites that charge entrance fees and standard amenity fees, through government internet sites, and through select third-party vendors. Go to http://store.usgs.gov/pass too order.

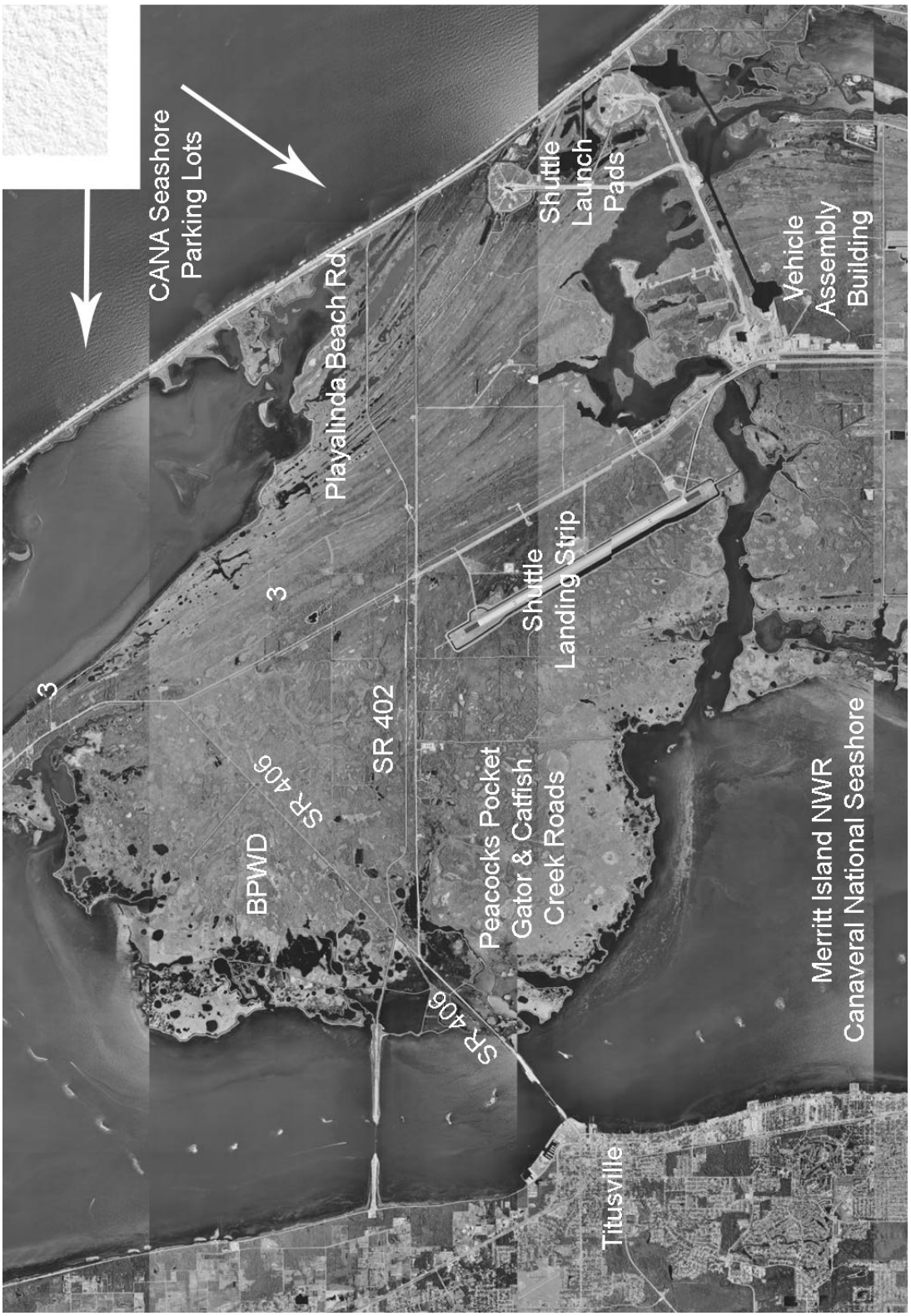
Appendix List

1. **Canaveral National Seashore NPS Location Map for Photographer's Site Guide**
2. **Birding Checklist**
3. **NPS Canaveral National Seashore Map**

Reference

1. Annotated map images used in the site guide provided by USGS at http://terraserver.microsoft.com/. From the TerraServer website FAQ: The images are from the U.S. Geological Survey, and are freely available for you to download, use and re-distribute. The TerraServer team and the USGS appreciate credit for their work on this project by displaying the message "Image courtesy of the USGS".

Appendix 1 - CANA Location Map



"Image courtesy of the USGS"

APPENDIX 2 - MINWR & CANA Birding Checklist

Northern Prairie Wildlife Research Center

Bird Checklists of the United States

Merritt Island National Wildlife Refuge

Titusville, Florida

Merritt Island National Wildlife Refuge, located just east of Titusville, Florida, shares a common boundary with the John F. Kennedy Space Center. Its coastal location, tropic-like climate, and wide variety of habitat types contribute to Merritt Island's diverse bird population. To date, 310 bird species have been identified on the refuge.

Of special interest are the breeding populations of southern bald eagles, brown pelicans, wood storks and mottled ducks. Spectacular migration of passerine birds, especially warblers, occurs during spring and fall. Winter peak concentrations of waterfowl often exceed 100,000. Eight species of herons and egrets are commonly observed year-round.

Tips On Birding

A good field guide and binoculars provide the basic tools useful in the observation and identification of birds. While the marshes and shallow impoundments are the most popular birding areas, mangrove-rimmed shorelines, cabbage palm and hardwood hammocks, palmetto and pine uplands, and the beach are all excellent places to find a variety of different bird species. The cool weather months (October-April) are generally the best times of year for birding. The best time of day is early morning and late afternoon.

Using This List

The check list is arranged taxonomically by order (solid line) and family (screened line). Representatives from 18 orders and 62 families have been identified on the refuge.

The word family is a classification term that places birds of similar appearance and habits into one group. Closely related families make up an order. All birds in the same order have some common characteristics. Learning to recognize families and orders can help in identifying new birds you may encounter at Merritt Island Refuge.

The bird list is in accordance with the American Ornithologists' Union "Check-List of North American Birds" as revised in 1982. Season and abundance are coded as follows:

Seasonal Occurrence

S - Spring - March to May
s - Summer - June to August
F - Fall - September to November
W - Winter - December to February

You may see some species outside the seasons indicated on the check list. This phenomenom is quite common for many birds. However, the check list is designed to indicate the general trend of migration and seasonal abundance for each species and therefore, does not account for unsual occurrence.

Abundance Designation

c - common: These birds are present in large numbers, are widespread, and should be seen if you look in the right habitat.

u - uncommon: These are present, but because of their low numbers, behavior, habitat, or distribution, they are not usually seen. However, an average bird watcher should be able to find them by looking in the right places at the right time.

o - occasional: These birds are present in low numbers and are not expected to be seen without a special effort to find them. At least a few are seen each year.

r - rare: These birds are not expected to be seen every year. They occur in low numbers, may also be secretive or hard to identify, and may be unreported for several years.

* - breeds on the refuge

LOONS	S	s	F	W
___ Common Loon	u	-	o	c
___ Red-throated Loon	-	-	-	r

GREBES	S	s	F	W
___ Horned Grebe	o	-	c	c
___ Pied-billed Grebe*	c	u	c	c

SHEARWATER, STORM-PETREL	S	s	F	W
___ Greater Shearwater	-	r	r	-
___ Audubon's Shearwater	-	r	r	r
___ Wilson's Storm-Petrel	r	r	r	-

PELICANS, GANNET, CORMORANT	S	s	F	W
___ American White Pelican	c	o	o	c
___ Brown Pelican*	c	c	c	c
___ Northern Gannet	o	-	r	u
___ Double-crested Cormorant*	c	c	c	c
___ Anhinga*	c	c	c	c
___ Magnificent Frigatebird	r	r	r	r

HERONS, EGRETS, IBIS, SPOONBILL	S	s	F	W
___ Great Blue Heron*	c	c	c	c
___ Green-backed Heron*	c	c	c	c
___ Little Blue Heron*	c	c	c	c
___ Cattle Egret*	c	c	c	u
___ Reddish Egret*	o	o	u	u
___ Great Egret*	c	c	c	c
___ Snowy Egret*	c	c	c	c
___ Tri-colored Heron*	c	c	c	c
___ Black-crowned Night-Heron*	u	u	u	u
___ Yellow-crowned Night-Heron	o	o	o	o
___ Least Bittern*	u	u	u	u
___ American Bittern	-	-	o	o
___ Wood Stork*	c	c	c	c
___ Glossy Ibis*	c	c	c	c
___ White Ibis*	c	c	c	c
___ Roseate Spoonbill	u	c	o	r
___ Greater Flamingo	o	o	o	o

GEESE, DUCKS	S	s	F	W
___ Canada Goose	-	-	-	r
___ Brant	r	-	-	r
___ Snow Goose	-	-	r	o
___ Fulvous Whistling-Duck	o	-	o	o
___ Mallard	r	-	o	o
___ American Black Duck	r	-	o	o
___ Mottled Duck*	c	c	c	c
___ Gadwall	u	-	u	u
___ Northern Pintail	u	-	c	c
___ Green-winged Teal	u	-	c	c

___ Blue-winged Teal	c	o	c	c
___ American Wigeon	c	r	c	c
___ European Wigeon	r	-	r	r
___ Northern Shoveler	c	r	c	c
___ Wood Duck*	o	r	o	o
___ Canvasback	u	r	u	u
___ Redhead	u	r	u	u
___ Ring-necked Duck	o	-	c	c
___ Greater Scaup	r	-	o	o
___ Lesser Scaup	c	o	c	c
___ Common Goldeneye	-	-	r	r
___ Bufflehead	r	-	o	o
___ Oldsquaw	-	-	r	r
___ White-winged Scoter	r	-	-	o
___ Surf Scoter	r	-	-	r
___ Black Scoter	r	r	r	o
___ Ruddy Duck	o	-	c	c
___ Hooded Merganser	o	-	c	c
___ Red-breasted Merganser	u	r	c	c

VULTURES, HAWKS, FALCONS, OSPREY	S	s	F	W
___ Turkey Vulture*	c	c	c	c
___ Black Vulture*	c	c	c	c
___ American Swallow-tailed Kite	o	o	-	-
___ Sharp-shinned Hawk	o	-	u	u
___ Cooper's Hawk	o	o	o	o
___ Red-tailed Hawk*	c	c	c	c
___ Red-shouldered Hawk*	u	u	u	u
___ Broad-winged Hawk	r	-	o	r
___ Swainson's Hawk	-	-	r	r
___ Bald Eagle*	u	u	u	u
___ Northern Harrier	u	-	c	c
___ Osprey*	c	c	c	c
___ Peregrine Falcon	r	-	o	o
___ Merlin	o	-	o	o
___ American Kestrel	u	r	c	c

QUAIL, TURKEY	S	s	F	W
___ Northern Bobwhite*	c	c	c	c
___ Wild Turkey*	o	o	o	o

LIMPKINS, RAILS, GALLINULE, COOT	S	s	F	W
___ Limpkin	r	-	-	r
___ King Rail*	o	o	o	o
___ Clapper Rail*	o	o	o	o
___ Virginia Rail	r	-	o	o
___ Sora	o	-	u	u
___ Black Rail*	r	r	r	r
___ Common Moorhen*	c	c	c	c
___ American Coot	c	o	c	c

PLOVERS, SANDPIPERS, GULLS, TERNS	S	s	F	W
___ American Oystercatcher*	o	o	o	r
___ Semipalmated Plover	o	r	o	c
___ Piping Plover	o	-	o	o
___ Wilson Plover*	o	o	o	r
___ Killdeer*	c	c	c	c
___ Black-bellied Plover	u	o	c	c
___ Ruddy Turnstone	c	o	c	c
___ American Woodcock	-	-	r	r
___ Common Snipe	o	-	u	u
___ Long-billed Curlew	r	-	r	r
___ Whimbrel	o	-	o	o
___ Upland Sandpiper	r	-	r	-
___ Spotted Sandpiper	u	o	u	u
___ Solitary Sandpiper	o	-	o	r
___ Willet*	c	c	c	c
___ Greater Yellowlegs	c	o	c	c
___ Lesser Yellowlegs	c	o	c	c

___ Red Knot	o	o	o	o
___ Pectoral Sandpiper	o	r	o	r
___ White-rumped Sandpiper	o	r	o	r
___ Least Sandpiper	c	o	c	c
___ Dunlin	c	o	c	c
___ Short-billed Dowitcher	u	o	c	c
___ Stilt Sandpiper	o	r	o	o
___ Semipalmated Sandpiper	c	o	c	-
___ Western Sandpiper	c	u	c	c
___ Marbled Godwit	o	-	o	o
___ Sanderling	c	u	c	c
___ American Avocet	o	o	c	c
___ Black-necked Stilt*	u	u	u	-
___ Wilson's Phalarope	-	r	r	-
___ Northern Phalarope	r	r	-	-
___ Pomarine Jaeger	r	-	o	o
___ Parasitic Jaeger	r	-	r	r
___ Great Black-backed Gull	o	o	o	o
___ Herring Gull	c	o	c	c
___ Ring-billed Gull	c	o	c	c
___ Laughing Gull*	c	c	c	c
___ Bonaparte's Gull	o	-	u	c
___ Black-legged Kittiwake	-	-	-	r
___ Gull-billed Tern*	o	u	o	r
___ Forster's Tern	c	o	c	c
___ Common Tern	r	-	r	r
___ Roseate Tern	r	-	r	-
___ Sooty Tern	-	r	r	-
___ Bridled Tern	r	r	r	-
___ Least Tern*	c	c	c	-
___ Royal Tern*	c	c	c	c
___ Sandwich Tern	o	r	o	o
___ Caspian Tern*	u	o	c	c
___ Black Tern	o	-	u	-
___ Black Skimmer*	c	c	c	c

DOVES	S	s	F	W
___ Rock Dove	u	u	u	u
___ Mourning Dove*	c	c	c	c
___ Common Ground-Dove*	c	c	c	c

CUCKOOS, ANIS	S	s	F	W
___ Yellow-billed Cuckoo*	o	o	o	-
___ Black-billed Cuckoo	r	-	r	-
___ Smooth-billed Ani	r	r	r	r

OWLS	S	s	F	W
___ Common Barn Owl*	o	o	o	o
___ Screech-Owl	c	u	c	c
___ Great Horned Owl*	u	u	u	u
___ Barred Owl*	o	o	o	o
___ Short-eared Owl	-	-	o	o

GOATSUCKERS	S	s	F	W
___ Chuck-will's-widow	c	c	c	o
___ Whip-poor-will	r	-	r	r
___ Common Nighthawk*	c	c	u	r

SWIFTS, HUMMINGBIRD	S	s	F	W
___ Chimney Swift*	u	u	u	-
___ Ruby-throated Hummingbird	o	r	o	r

KINGFISHERS	S	s	F	W
___ Belted Kingfisher*	c	o	c	c

WOODPECKERS	S	s	F	W
___ Northern Flicker*	u	u	u	u
___ Pileated Woodpecker*	u	u	u	u
___ Red-bellied Woodpecker*	c	c	c	c
___ Red-headed Woodpecker	r	r	r	r
___ Yellow-bellied Sapsucker	u	-	u	u
___ Hairy Woodpecker	r	-	r	r
___ Downy Woodpecker*	u	u	u	u

FLYCATCHERS, SWALLOWS, WRENS, THRUSHES, WARBLERS, SPARROWS	S	s	F	W
___ Eastern Kingbird*	u	u	u	-
___ Gray Kingbird	o	o	o	-
___ Western Kingbird	-	-	r	r
___ Great Crested Flycatcher*	u	u	o	r
___ Eastern Phoebe	o	-	c	c
___ Acadian Flycatcher	r	-	r	-
___ Alder Flycatcher	-	-	r	-
___ Least Flycatcher	-	-	r	-
___ Tree Swallow	c	r	c	c
___ Bank Swallow	o	r	o	-
___ Northern Rough-winged Swallow	o	r	o	-
___ Barn Swallow	c	r	c	r
___ Cliff Swallow	o	-	o	-
___ Purple Martin*	u	u	r	-
___ Blue Jay*	c	c	c	c
___ Scrub Jay*	c	c	c	c
___ Fish Crow *	c	c	c	c
___ Tufted Titmouse	o	o	o	o
___ House Wren	o	-	c	c
___ Carolina Wren*	c	c	c	c
___ Marsh Wren	o	-	r	o
___ Sedge Wren	u	-	o	u
___ Northern Mockingbird*	c	c	c	c
___ Gray Catbird	c	-	c	c
___ Brown Thrasher*	o	o	o	o
___ American Robin	c	-	c	c
___ Wood Thrush	r	-	r	-
___ Hermit Thrush	o	-	o	o
___ Swainson's Thrush	o	-	o	-
___ Gray-cheeked Thrush	o	-	o	-
___ Veery	o	-	o	-
___ Blue-gray Gnatcatcher*	o	o	u	c
___ Ruby-crowned Kinglet	o	-	o	u
___ Water Pipit	r	-	r	r
___ Cedar Waxwing	o	-	o	c
___ Loggerhead Shrike*	u	u	u	u
___ European Starling*	c	c	c	c
___ White-eyed Vireo*	c	c	c	c
___ Yellow-throated Vireo	u	-	u	r
___ Solitary Vireo	o	-	o	o
___ Black-whiskered Vireo*	o	u	r	-
___ Red-eyed Vireo	o	o	o	-
___ Black-and-white Warbler	c	-	c	u
___ Prothonotary Warbler	o	-	o	-
___ Swainson's Warbler	r	-	r	-
___ Worm-eating Warbler	r	-	o	-
___ Blue-winged Warbler	r	-	o	-
___ Golden-winged Warbler	-	-	r	-
___ Tennessee Warbler	o	-	o	r
___ Orange-crowned Warbler	o	-	o	u
___ Nashville Warbler	r	-	r	-
___ Northern Parula	o	o	o	r
___ Yellow Warbler	o	-	o	r
___ Magnolia Warbler	o	-	o	-
___ Cape May Warbler	u	-	u	r
___ Black-throated Blue Warbler	u	-	u	r
___ Yellow-rumped Warbler	u	-	c	c
___ Black-throated Green Warbler	r	-	o	-
___ Blackburnian Warbler	o	-	o	o
___ Yellow-throated Warbler	o	-	o	o
___ Chestnut-sided Warbler	r	-	o	-
___ Bay-breasted Warbler	r	-	u	r
___ Blackpoll Warbler	u	-	o	-

___ Pine Warbler*	o	o	o	o
___ Prairie Warbler*	u	u	u	u
___ Palm Warbler	u	-	c	c
___ Ovenbird	u	-	u	o
___ Northern Waterthrush	u	-	u	r
___ Louisiana Waterthrush	r	-	r	-
___ Kentucky Warbler	r	-	r	-
___ Connecticut Warbler	r	-	r	-
___ Common Yellowthroat*	c	c	c	c
___ Yellow-breasted Chat*	r	r	r	r
___ Hooded Warbler	o	-	o	-
___ Wilsons's Warbler	-	-	r	-
___ American Redstart	u	-	c	r
___ House Sparrow*	c	c	c	c
___ Bobolink	u	-	o	-
___ Eastern Meadowlark*	c	c	c	c
___ Red-winged Blackbird*	c	c	c	c
___ Orchard Oriole	r	-	r	-
___ Northern Oriole	o	-	o	-
___ Rusty Blackbird	r	-	r	r
___ Boat-tailed Grackle*	c	c	c	c
___ Common Grackle*	c	c	c	c
___ Brown-headed Cowbird	u	o	u	u
___ Scarlet Tanager	o	-	o	-
___ Summer Tanager*	o	o	o	-
___ Northern Cardinal*	c	c	c	c
___ Rose-breasted Grosbeak	o	-	o	-
___ Blue Grosbeak*	o	o	r	-
___ Indigo Bunting*	o	o	o	o
___ Painted Bunting*	o	o	o	o
___ Dickcissel	r	-	r	r
___ Pine Siskin	-	-	r	r
___ American Goldfinch	r	-	u	u
___ Rufous-sided Towhee*	c	c	c	c
___ Savannah Sparrow	c	-	c	c
___ Grasshopper Sparrow	o	-	o	o
___ Henslow's Sparrow	-	-	r	r
___ Sharp-tailed Sparrow	o	-	o	o
___ Seaside Sparrow	-	-	o	o
___ Vesper Sparrow	r	-	r	o
___ Lark Sparrow	-	-	r	r
___ Bachman's Sparrow*	r	r	r	r
___ Chipping Sparrow	o	-	o	o
___ Field Sparrow	r	-	r	o
___ White-throated Sparrow	-	-	r	r
___ Fox sparrow	-	-	r	r
___ Swamp Sparrow	o	-	c	c
___ Song Sparrow	r	-	o	o
___ Lincoln's Sparrow	-	-	r	r

Since the refuge is situated along the coast, it is on a major migration corridor, is subject to violent storms, and is frequented by many experienced birdwatchers, the list of accidental species is quite large. The following species have been seen less than 5 times on the refuge or have not been seen at all since 1972. Where known, the year the bird was last observed is provided:

Red-necked Grebe	1977
Eared Grebe	1976
Western Grebe	1978
White-tailed Tropicbird	1981
Blue-faced Booby	1978
Brown Booby	1990
Great Cormorant	1979
Whistling Swan	1973
White-cheeked Pintail	1990
Cinnamon Teal	1989
Harlequin Duck	1960
Mississippi Kite	1992
Sandhill Crane	1992
Purple Gallinule	1989
Yellow Rail	1989
Lesser Golden-Plover	1988
Purple Sandpiper	1980
Buff-breasted Sandpiper	1988
Hudsonian Godwit	1958
Black-tailed Godwit	1981
Ruff	1989
Red Phalarope	

Glaucous Gull	
Sabine's Gull	1963
Noddy Tern	
Burrowing Owl	1976
Red-cockaded Woodpecker	1976
Scissor-tailed Flycatcher	1969
Olive-sided Flycatcher	1974
Horned Lark	1951
American Crow	1976
Brown-headed Nuthatch	
Brown Creeper	
Golden-crowned Kinglet	1991
Western Meadowlark	1972
Purple Finch	
Dark-eyed Junco	1977
White-crowned Sparrow	1990
Lapland Longspur	1988
Franklin's Gull	1987
Common Black-headed Gull	1991
Black-shouldered Kite	1991
L. Black-backed Gull	1992
Warbling Vireo	1989
Snail Kite	1990

For additional information contact:

Refuge Manager
Merritt Island NWR
P.O. Box 6504
Titusville, Florida 32782
Telephone: 321/861-0667

or visit the Merritt Island NWR website at: ***http://merrittisland.fws.gov***

This resource is based on the following source:

U.S. Fish and Wildlife Service. No date. Merritt Island National Wildlife Refuge birds. U.S. Fish and Wildlife Service. Unpaginated.

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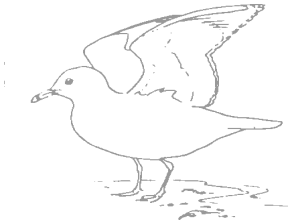
U.S. Fish and Wildlife Service. No date. Merritt Island National Wildlife Refuge birds. U.S. Fish and Wildlife Service. Unpaginated. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.govmerritt.htm (Version 22MAY98).

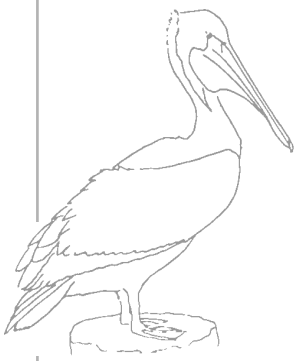
Return to **Bird Checklists of Florida**
Return to **Bird Checklists of the United States**

U.S. Department of the Interior | U.S. Geological Survey
URL: http://www.npwrc.usgs.gov/resource/birds/chekbird/r4/merritt.htm
Page Contact Information: npwrc@usgs.gov
Page Last Modified: August 3, 2006

Ring-Billed Gull

A small white-headed gull. Bill is yellow with a black ring at the tip. Yellow legs.



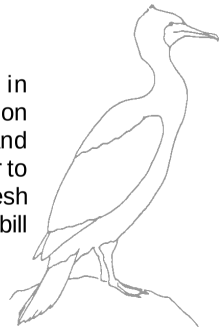


Brown Pelican

A bulky water-bird commonly seen diving headfirst into the surf. Flies in orderly lines. Adult has yellow forehead and brown neck in breeding plumage. Endangered in Louisiana, Mississippi, Texas and California. Its cousin, the White Pelican, is a common winter resident.

Cormorant

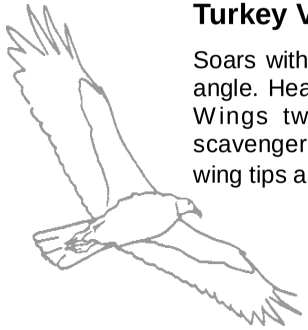
Swims under the water in search of fish. More common in salt water. Orange bill and throat. Bill is hooked. Similar to the Anhinga which prefers fresh water, has a straight pointed bill and a long snakelike neck.



Soaring Birds

Osprey

Wingspan is 4-1/2 — 6 feet. White head with black streak through cheeks. Black back and white belly. Flies with a crook in its wings.



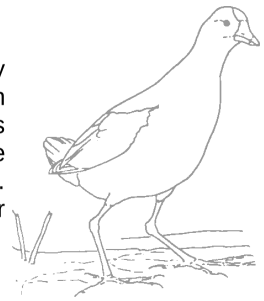
Turkey Vulture

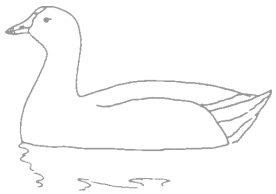
Soars with its wings raised up at an angle. Head is red and unfeathered. Wings two-toned underneath. A scavenger. Black Vulture has white wing tips and a black head.

Duck-like Birds

Common Moorhen

The name was recently changed from common Gallinule. Are not ducks but have chicken-like beaks and feet. Bill is red. Feeds on freshwater plants and insects.





American Coot

Similar to a Gallinule but has a white beak. Toes are webbed. Often swims in large flocks.

Pied-Billed Grebe

Bobs up and down like a cork, looking for fish. Common in shallow, fresh water. Seldom flies.

Birds of the Seashore

APPENDIX 2 - MINWR & CANA Birding Checklist

Canaveral

National Seashore
National Park Service
U.S. Department of the Interior

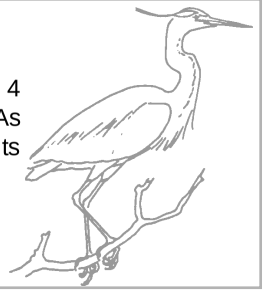
Over 310 species of birds have been observed at Canaveral National Seashore. This brochure describes some of those most commonly seen.

Help protect birds and other wildlife by properly disposing of fishing line and other litter, and by not feeding them.

Wading Birds

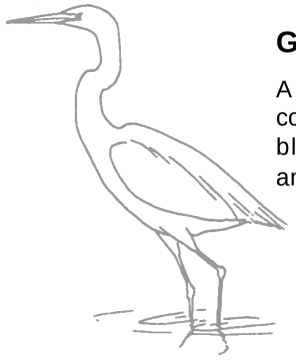
Great Blue Heron

The tallest heron, stands 4 feet tall. Blue-gray in color. As with all herons, flies with its neck folded in.



Great Egret

A large heron, completely white with black legs and feet and a yellow bill.



Tricolored Heron

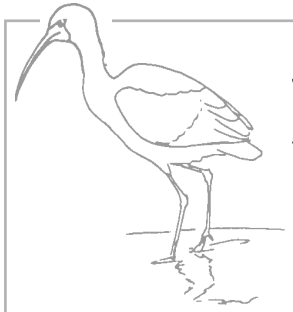
Also called Louisiana heron. A smaller heron, blue-gray in color with a white belly and white rump. The little blue heron is about the same size, but its body is totally blue.

Snowy Egret

A white heron with yellow feet, black bill and black legs.

White Ibis

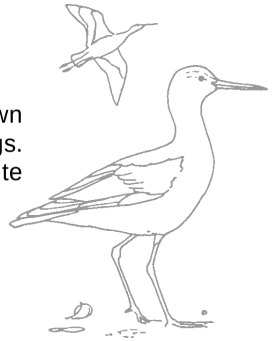
A medium-sized white bird with black wing tips, red legs and a red bill. Bill is curved. Flies with its neck extended.



Shore Birds

Willet

A large plain gray-brown sandpiper with long legs. Striking black and white wing pattern in flight.

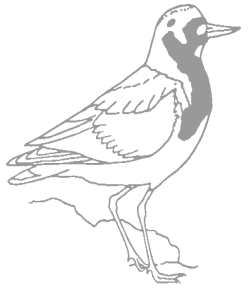


Sanderling

The smallest of the sandpipers, pale gray and white. Often seen rapidly chasing the retreating waves. Bold white wing stripe seen in flight.

Ruddy Turnstone

A plump shorebird with orange-red legs and a distinct head and breast pattern. Back is a reddish color in summer. In flight notice the black, brown and white pattern of the wings, rump and tail.



Royal Tern

Often seen flying overhead or plunging into the waves. The Royal Tern has an orange bill, a white forehead and a black crest on the head. Terns are distinguished from gulls by having long narrow wings, slender pointed beaks and a forked tail. Gulls are more robust, have broader wings, a square tail and they seldom dive.

Laughing Gull

A small gull with a red bill and legs. Black head in the summer breeding season. Back and wings a dark slate color. Winter adult has a mottled head and a darker bill.

Appendix 3 - NPS CANA Map

North

Unpaved road
Trail
Seashore/ Refuge area
John F. Kennedy Space Center and Cape Canaveral AFS - access controlled
Ranger station
Wheelchair accessible
Self-guiding trail
Boat launch
Telephone
Drinking water

0 1 5 Kilometers
0 1 5 Miles

Playing it Safe
Beware of rough surf conditions, strong ocean currents, and stinging jellyfish when swimming, wading, or surfing. Carry ample drinking water; protect yourself from the bright sun and biting insects. Thunderstorms with abundant lightning are common in summer; wait out storms in your vehicle or under shelter, but do not stand under trees.

Fishing
Freshwater, saltwater, and commercial fishing are subject to size and possession limits and may require a license or special use permit; inquire at information centers.

Boating
Launch sites in the Refuge and Seashore provide access to Mosquito Lagoon and Indian River. Airboats are prohibited.

Ponce de Leon Inlet
To Daytona Beach
NEW SMYRNA BEACH
Exit 84
44
A1A
442
Exit 83
EDGEWATER
BETHUNE BEACH
Turtle Mound
Shipyard Island
Canaveral National Seashore Information Center
Orange Island
1
95
Eldora Hammock
Riverbreeze Park
Eldora
Fishing docks
Located at Parking Areas #7 and #8
Castle Windy
Apollo Road ends
Old Channel
Plantation Island
Seminole Rest
OAK HILL
Beach
BILL'S HILL
INTRACOASTAL WATERWAY
MOSQUITO LAGOON
ATLANTIC OCEAN
Kennedy Parkway
Exit 82
5A
INDIAN RIVER
Klondike Beach
Pardon Island
Manatee Viewing Area
Haulover Canal
Cucumber Island
Dummit Creek
Turtlepen Point
Road ends
Cruickshank Trail
Wildlife Drive
Observation Tower
Point
Black
one-way
Oak and Palm Hammock Trails
406
Bio Lab Road
Scrub Tr
Kennedy Parkway
3
Eddy Creek
Playalinda Beach
Located at Eddy Creek and Parking Area #8
46
Exit 81
Mims
SALT LAKE
Loughman Lake
SOUTH LAKE
402
Exit 80
406
Canaveral National Seashore Headquarters Information
TITUSVILLE
Merritt Island National Wildlife Refuge Visitor Information Center
(road closed to public)
Launch Complex 39B
Launch Complex 39A
Shuttle Landing Facility
Vehicle Assembly Building
JOHN F KENNEDY SPACE CENTER
(public access controlled)
False Cape
50
Exit 79
405
Kennedy Space Center Visitor Complex
Open to public via 3 and 405
(public access controlled)
Exit 78
407
River
528
To Orlando
Bee Line Expressway (toll)
St Johns
95
Exit 77
CAPE CANAVERAL AIR FORCE STATION
No motorized boats
BANANA RIVER
Cape Canaveral
Canaveral Barge Canal
524
COCOA
Exit 76
520
Exit 75
LAKE POINSETT
To Melbourne
To Cocoa Beach