

Great Dismal Swamp National Wildlife Refuge

Interagency Transportation Assistance Group: Transportation Observations, Considerations, and Recommendations



July 2014

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Volpe

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Executive Summary

In 2011, the U.S. Fish and Wildlife Service (FWS) and the U.S. Department of Transportation (USDOT) John A. Volpe National Transportation Systems Center (Volpe Center) conducted a Regional Alternative Transportation Evaluation (RATE) in FWS Region 5. The purpose of the RATE was to ensure effective consideration and integration of Alternative Transportation Systems (ATS) into the goals and recommendations of the Region 5 Long Range Transportation Plan (LRTP). Due to its proximity to urban population centers, the Great Dismal Swamp National Wildlife Refuge (“refuge,” “Swamp,” or “GDS NWR”) was one of four refuges within Region 5 visited by the RATE team to identify specific opportunities for ATS. As a result of its findings, the RATE team recommended GDS NWR to host a follow up Inter-agency Transportation Assistance Group (TAG).

The TAG conducted its site visit at GDS NWR on March 19 and 20, 2014. TAG participants were asked to identify transportation issues impacting the refuge, ways to improve access to and within the refuge, as well as opportunities to address the issues raised and potential funding sources for their implementation. ATS, or non-personal vehicle transportation options, were a key focus of the discussions. A number of suggestions were offered during the meetings, including ways to increase bicycle access and improve communication and marketing to the area population as well as opportunities to partner with both the cities of Suffolk and Chesapeake, and regional governments.

The TAG’s first meeting focused on access to the refuge from the City of Suffolk to the west. The City of Suffolk has the most direct access to the refuge with four different entrances; however, access is primarily limited to personal automobiles. A number of opportunities for enhancing bicycle and transit access to and within the refuge emerged. This side of the refuge contains many bicycle and pedestrian trails that the refuge can better market to local and regional bicycling organizations, including development of a bicycle collaborative. The Suffolk transit service, Virginia Regional Transit, has a stop located one-quarter of a mile from an entrance to the refuge that leads to more interior trails and could serve as a valuable bicycle connection. The refuge can also consider creating a park and bike lot on Jericho Lane near White Marsh Road to relieve pressure on the existing parking area at the end of Jericho Lane.

The TAG held its second meeting the following day on the Chesapeake side of the refuge, which only has direct access to the Refuge by boat and one ditch road. With so few access points, there is a noticeable need for expanded access and connectivity to Chesapeake. Several planning initiatives underway by the City of Chesapeake provide significant opportunities for coordination to increase access to the refuge, including a foot bridge over Big Entry Ditch, a boat landing slough at the end of Northeast Ditch, and a foot trail along the Feeder Ditch to Lake Drummond. The new parking and restroom facilities recently constructed in Chesapeake present GDS NWR with an opportunity to establish a visitor center off of Route 17 for increased visibility and accessibility. The TAG also revealed the need for improved communications and marketing with the local communities to increase their understanding and commitment to the refuge as well as Suffolk and Chesapeake’s goals. Several of the TAG participants commented that they have lived in the area for long periods of time and did not previously know that the refuge had so much to offer the public in terms of recreations and environmental education.

The TAG team synthesized the findings into short- and long-term recommendations for Suffolk, Chesapeake, and the region. The recommendations primarily focus on establishing a transit connection, expanding bicycle and pedestrian connectivity, coordinating regional communications, and exploring concessionaire opportunities for bicycle rentals and boat tours. This TAG Report serves as an additional resource for the refuge to use as it considers and plans future transportation developments by documenting stakeholder needs, opportunities and recommendations for continued analysis and action.

Introduction

The Great Dismal Swamp National Wildlife Refuge Transportation Assistance Group report explores transportation challenges and opportunities facing the refuge as well as provides recommendations in how to address the issues identified. The report begins with a Background and Existing Conditions section that outlines the surrounding region’s demographics and transportation infrastructure. On-site meetings with refuge staff and stakeholders provided the TAG team with greater knowledge and understanding of the refuge’s existing transportation issues, visitation patterns, and partnerships. Data requests were also made during these meetings to fill any gaps the TAG team discovered.

GDS NWR is situated between Suffolk and Chesapeake in southern Virginia. Each city presented different transportation issues for the refuge. Therefore the report is divided into Suffolk, Chesapeake, and Regional transportation problems, needs, and opportunities. In closing, the report then proposes and outlines Suffolk, Chesapeake, and Regional short- and long-term recommendations for the refuge. Many of the recommendations involve continued coordination and collaboration with the stakeholders that participated in the on-site meetings to expand the refuge’s alternative transportation options. GDS NWR has many opportunities worth pursuing that could assist in increasing access to and mobility within the refuge.

Background and Existing Conditions

The GDS NWR is located in southeastern Virginia and northeastern North Carolina between the major tourist draws of Colonial Williamsburg, Virginia, and the Outer Banks, North Carolina. The refuge is adjacent to the Cities of Chesapeake and Suffolk, Virginia, on the east and west respectively. The southern side of the refuge borders on the communities of Sunbury and South Mills, North Carolina. Norfolk, Virginia, is approximately twelve miles northeast of GDS NWR. Table 1 shows the populations of these neighboring cities. Several major roadways run near the refuge, including Interstates 64, 264, and 664 and U.S. Routes 13 and 17. Route 17 is a significant corridor for travel between Williamsburg, Virginia, and the Outer Banks of North Carolina.

Table 1: Populations of neighboring cities

City	Population (2012)
Chesapeake, VA	228,417
Norfolk, VA	245,782
Outer Banks, VA	57,755
Suffolk, VA	85,181
Williamsburg, VA	15,167
South Mills, NC*	454
Sunbury, NC*	289

Source: American Community Survey

* 2010 population

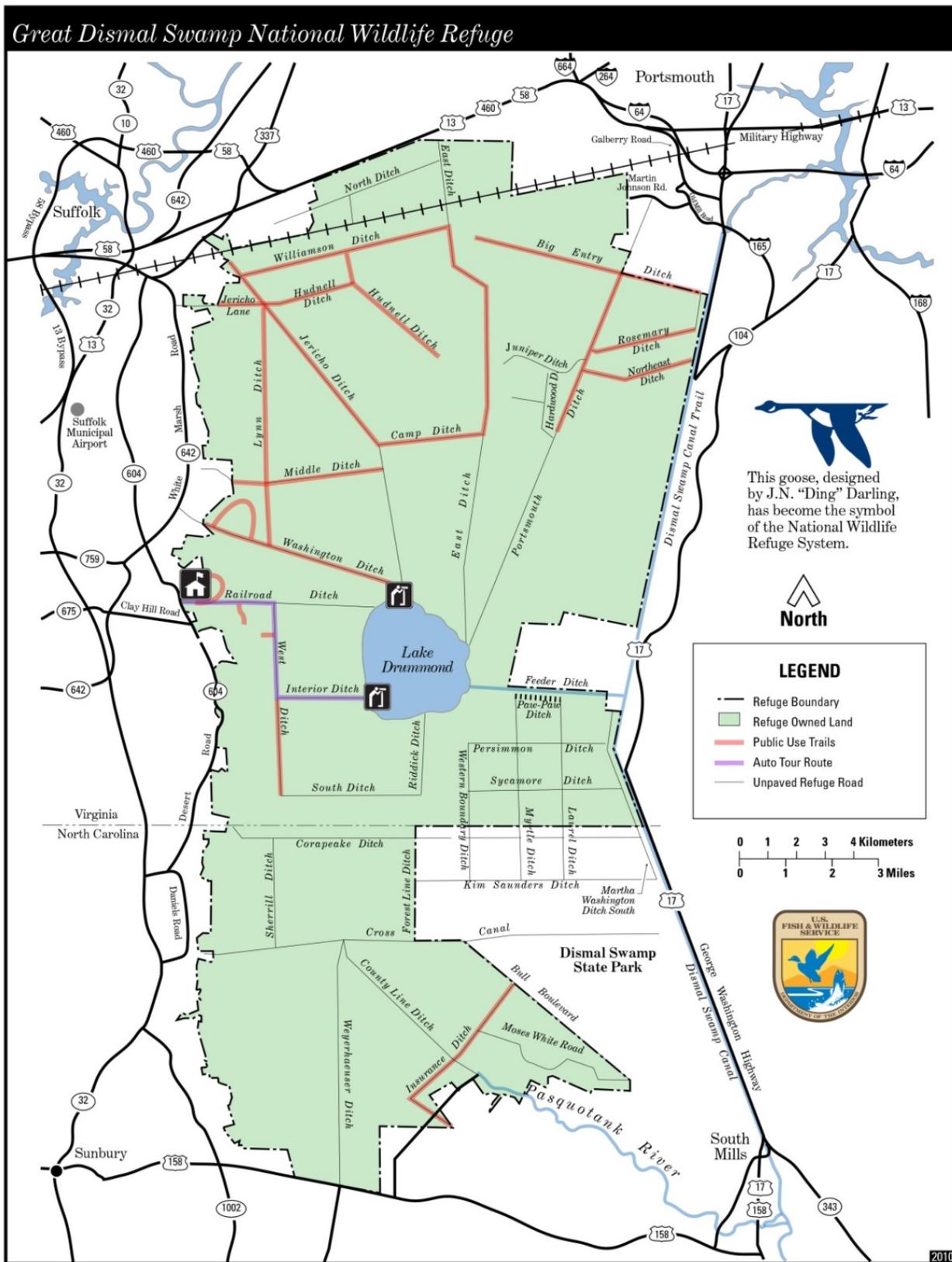
The refuge covers 113,000 acres of land managed for wildlife habitat and environmental preservation as well as public use in the form of hunting, fishing, wildlife observation and photography, and

¹ The Region 5 RATE report also provides extensive reporting on the background of the Great Dismal Swamp. Efforts have been taken to minimize material repeated from the RATE report.

environmental education and interpretation. GDS NWR's natural resources include thousands of acres of diverse habitat and Lake Drummond, a 3,100-acre natural lake. The U.S. Army Corps of Engineers (USACE) manages the Dismal Swamp Canal that runs down the east side of the refuge and is part of the Intracoastal waterway. The state of Virginia requires the study of the swamp and Lake Drummond as part of its fourth grade curriculum due to its significance to the colonization of the U.S. Inclusion in education curriculum enables the refuge to leverage opportunities for environmental education and provides a basis for interpretive programs to school groups as well as individuals.

There are more than 100 miles of ditch roads within the refuge; however, only 46 miles are open to the public for hiking or biking (Figure 1). The publicly accessible roads include a six-mile auto tour route from Railroad Ditch to the west side of Lake Drummond. The refuge also has a number of facilities to enable visitors of all capabilities to explore parts of the refuge, including a one-mile boardwalk loop at Washington Ditch and the Underground Railroad Pavilion a short distance down Railroad Ditch. The Headquarters and Visitor Contact Station near the Railroad Ditch entrance on the Suffolk side of the refuge is a significant resource for visitors to learn about swamp habitats and to receive environmental interpretation from refuge staff.

Figure 1: Map of GDS NWR



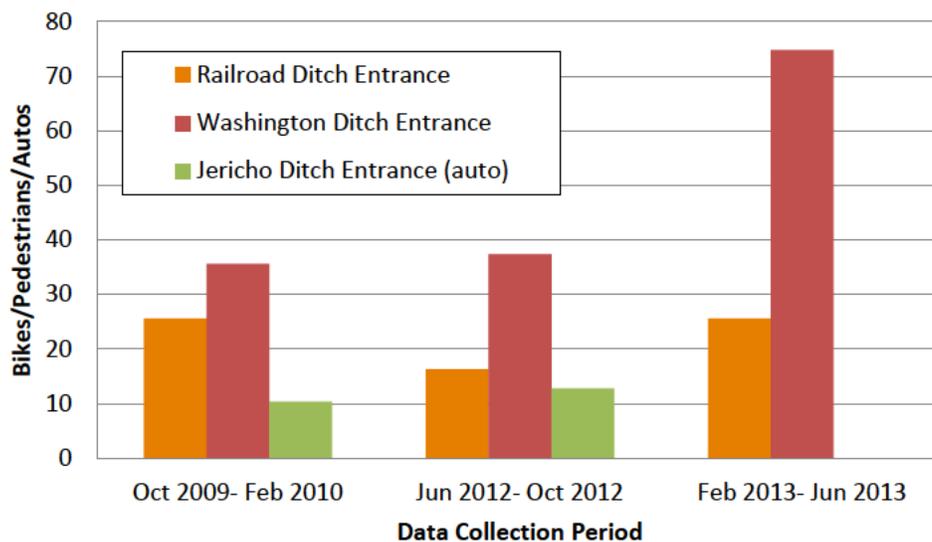
Source: FWS

Access to GDS NWR is limited to a relatively small number of entrances given the size of the refuge. The public can enter through four entrance points on the Suffolk side and two entrances on the Chesapeake side (Table 2). As of April 2014, there were no public transportation or bike routes providing direct access to the refuge. The vast majority of visitors to the refuge arrive by personal vehicle, which causes parking congestion at the entry points during peak times. The Washington Ditch entrance receives the greatest number of visitors each season, as shown in Figure 2 and Figure 3. The Railroad Ditch is experiencing increasing activity since the refuge began allowing Saturday access to the auto tour to Lake Drummond using self-service permits in early 2014. Previously, the auto tour was only available weekdays when the refuge staff was present. Railroad Ditch entrance traffic counter data in March 2014 shows an average of nearly 19 vehicles per Saturday and six vehicles per weekday. Access to Lake Drummond by auto tour is limited to personal vehicles and vans with a maximum capacity of 24 passengers. Larger vehicles, such as school buses, are not able to turn around in the parking area. The Portsmouth Ditch entrance on the northeast corner of the refuge is located within a residential area. The Portsmouth Ditch road is scheduled for rehabilitation in 2016 and the refuge is considering creating short loop trails on recently acquired land on the west side of the road. The refuge staff hopes the improved road and new trails will increase interest in the area.

Table 2: Entrances to Great Dismal Swamp NWR

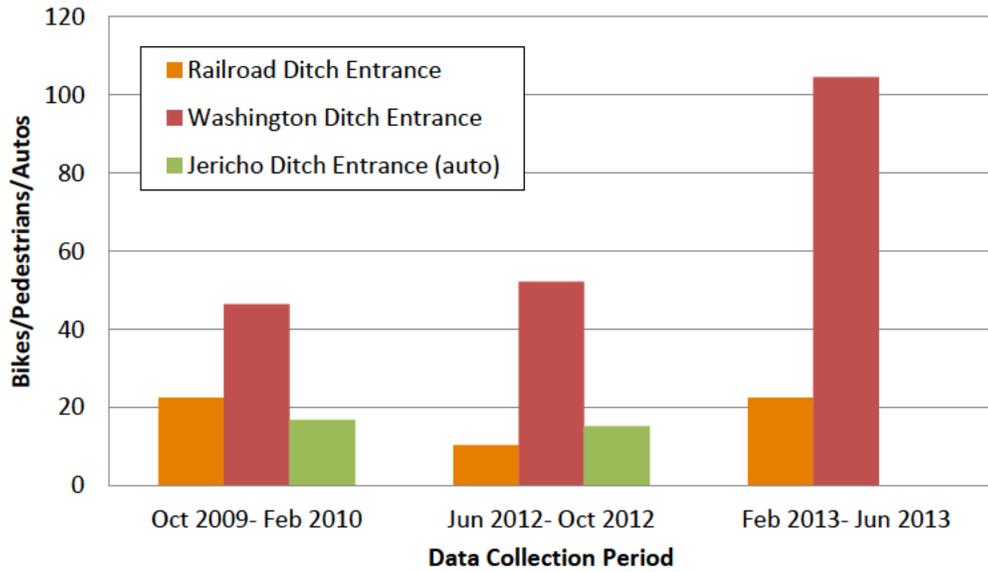
Name	Distance to Parking	Mode Access	Condition
Suffolk			
Jericho	2 miles	Auto, bike, pedestrian	Road not suitable for transit vehicles
Washington Ditch	1 mile	Auto, bike, pedestrian	Direct transit access may be difficult
Visitor Contact Station	Adjacent	Auto, bike, pedestrian	Good condition
Railroad Ditch	6 miles to Lake	Auto, bike, pedestrian	Large vehicles cannot turn at lake
Chesapeake			
Portsmouth Ditch	1.8 miles	Auto, bike, pedestrian	Reconstruction scheduled for 2016
Feeder Ditch	N/A	Water-only	Requires use of USACE weir

Figure 2: Average visitation by weekday



Source: GDS NWR counters

Figure 3: Average visitation by weekend day



Source: GDS NWR counters

Visitation

Between 60,000 and 70,000 people visit the Great Dismal Swamp annually. According to refuge staff, the majority of visitors are from outside the local communities of Suffolk and Chesapeake, but within the larger Southern Virginia and Northern North Carolina region. Additionally, the staff mentioned the refuge attracts some international visitors as well. A significant portion of visitors are tourists traveling between Colonial Williamsburg and the Outer Banks. It is an easy day trip from each location and offers a respite from large crowds in those areas. The annual Birding Festival draws the refuge's largest crowds each spring during the peak migration period for neo-tropical birds. GDS NWR hosts a number of free activities during the festival including guided tours, canoe birding, and night events.

GDS NWR has a unique and important place in American history that contributes to its draw for visitors. George Washington commissioned the Washington Ditch and established Dismal Town during the 1760s. Later, the swamp was used by escaping slaves as part of the Underground Railroad. In 2004, the National Park Service designated the Great Dismal Swamp an important landmark on the National Underground Railroad Network to Freedom. To date, it is the only National Wildlife Refuge with the designation. GDS NWR recently built the Underground Railroad Pavilion as a place to learn about the history of the maroons, or escaped slaves, in the swamp (Figure 4).

Figure 4: Underground Railroad Pavilion trail entrance



Source: Volpe Center

In 2006, GDS NWR published its Final Comprehensive Conservation Plan (CCP).² Required by the National Wildlife Refuge System Improvement Act of 1997, CCPs provide recommendations and action items for the strategic management of individual National Wildlife Refuges. The 15-year plan examines all aspects of management from habitat management to environmental education and partnership opportunities. GDS NWR's CCP provided several TAG-relevant recommendations that focused on increasing refuge access and mobility. Although published in 2006, the following recommendations from the CCP have not yet been implemented:

- Interpretive boat or kayak tours along the Dismal Swamp Canal and in Lake Drummond
- Interpretive tram tours
- Bicycle and kayak concessionaires
- New visitor center off of Route 17
- Hiking trail along Feeder Ditch

While these recommendations have not been implemented, the plan references and incorporates these recommendations in the TAG analysis with the intention that they will be carried out.

² [GDS NWR CCP, 2006](#)

Partnerships and Programs

The refuge has important partnerships with the Cities of Suffolk and Chesapeake. The City of Suffolk offers a naturalist tour of the refuge using its own 24-passenger bus. The tours operate on Saturdays from March to October. Participants pay \$10 for adults and \$8 for senior citizens and children for a four-hour tour that includes Lake Drummond and Washington Ditch. Refuge staff already coordinates with Suffolk tourism, especially in the promotion of events like the Birding Festival. They also work closely with Chesapeake Tourism to promote the festival as well as other refuge events and statewide marketing initiatives. The City of Chesapeake has made significant investments in the Dismal Swamp Canal Trail that runs 8.5 miles along the east side of the Dismal Swamp Canal, which is the eastern boundary of the refuge. Recent improvements in this area include a new restroom facility and boat launch at the parking area off Route 17 and an extension of the trail north to Deep Creek Park. In April 2014, the City of Chesapeake was awarded a Federal Lands Access Program (FLAP) grant by the Federal Highway Administration Eastern Federal Lands (FHWA-EFL) to pave the parking area at the southern end of the trail near Ballahack Road and build restroom facilities. Chesapeake is also in the midst of major land use changes and planning initiatives that could have a positive impact on access to the refuge, which will be discussed in more detail in the following sections.

The Great Dismal Swamp is also considered an Urban Wildlife Refuge, making increased local connectivity and accessibility an even higher priority. The Urban Wildlife Refuge Program (URP) seeks to “understand urban audiences, identify barriers connecting, and identify strategies for the Fish and Wildlife Service to overcome these barriers.”³ The URP has identified National Wildlife Refuges in close proximity to major metropolitan areas across the country including the Norfolk/Hampton Roads, Virginia metropolitan area.

Area Demographics

The 2011 RATE report included analysis of underserved populations, which were defined using three demographic variables (median household income, car ownership per household, and percentage of non-white population). The populations were mapped using 2011 data from the American Community Survey at the Census block level along with transportation infrastructure. These maps have been updated for the TAG report using new Census data and available transportation data from Hampton Roads Transit and other local and state geographic information systems (GIS) resources.

As shown in the maps in Figure 5 through 8, downtown Suffolk has higher concentrations of minority, low income and carless populations than other areas in the city. The downtown area is about one and a half miles from the Jericho Lane Entrance and the northeast corner of the refuge and has a high concentration of underserved populations (Figure 8). GDS NWR is also within 16 miles of downtown Norfolk, Portsmouth, and Chesapeake, which have high concentrations of underserved populations as well. As shown in Figure 8, the areas of North Carolina closest to the refuge, which are more rural, do not have concentrations of underserved populations as high as those in the Virginia communities, which are more urban. A critical point apparent in the maps is the lack of public transportation and bicycle infrastructure from these populations to the refuge. FWS and the refuge can use this information to engage local municipalities in identifying specific barriers to access for these underserved populations and opportunities to overcome them, addressing the primary goals and purpose of the URP.

³ Urban Refuge Initiative Fact Sheet, http://www.fws.gov/refuges/vision/pdfs/UrbanInitiativeFactSheet_Jan_2014.pdf

Figure 5: Low-Income Populations and Accessibility to GDS NWR

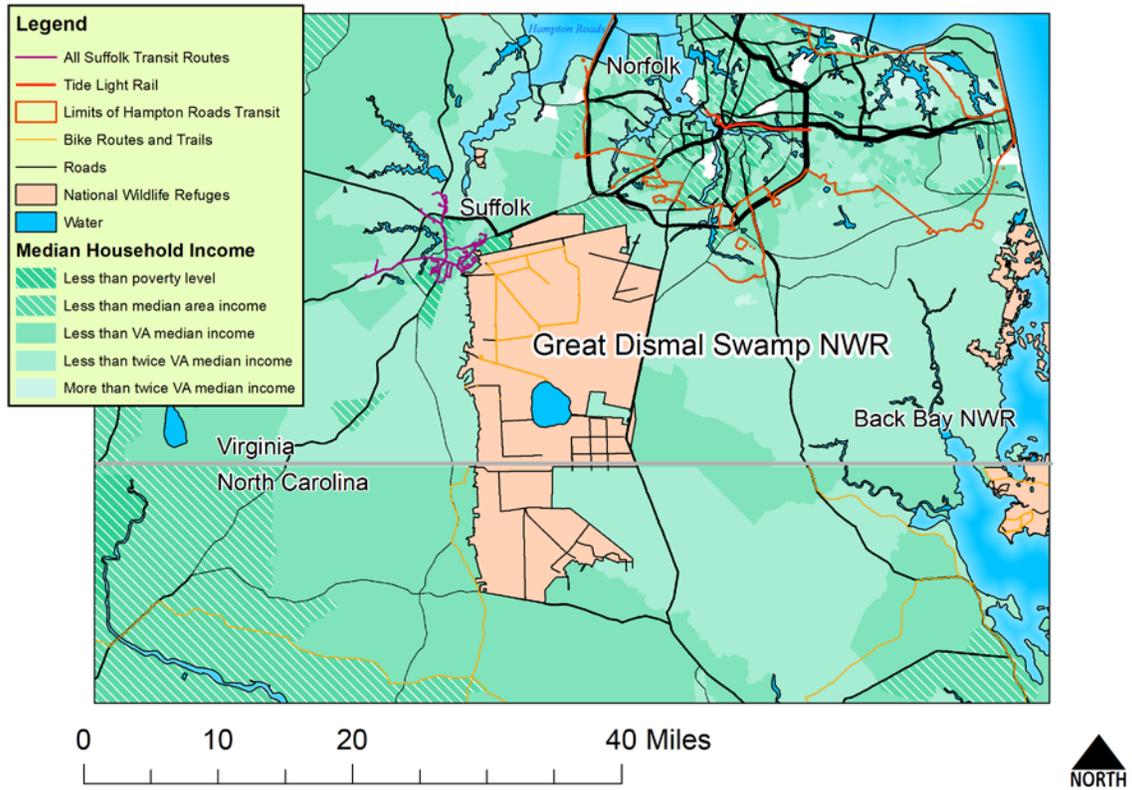


Figure 6 Non-White Populations and Accessibility to GDS NWR

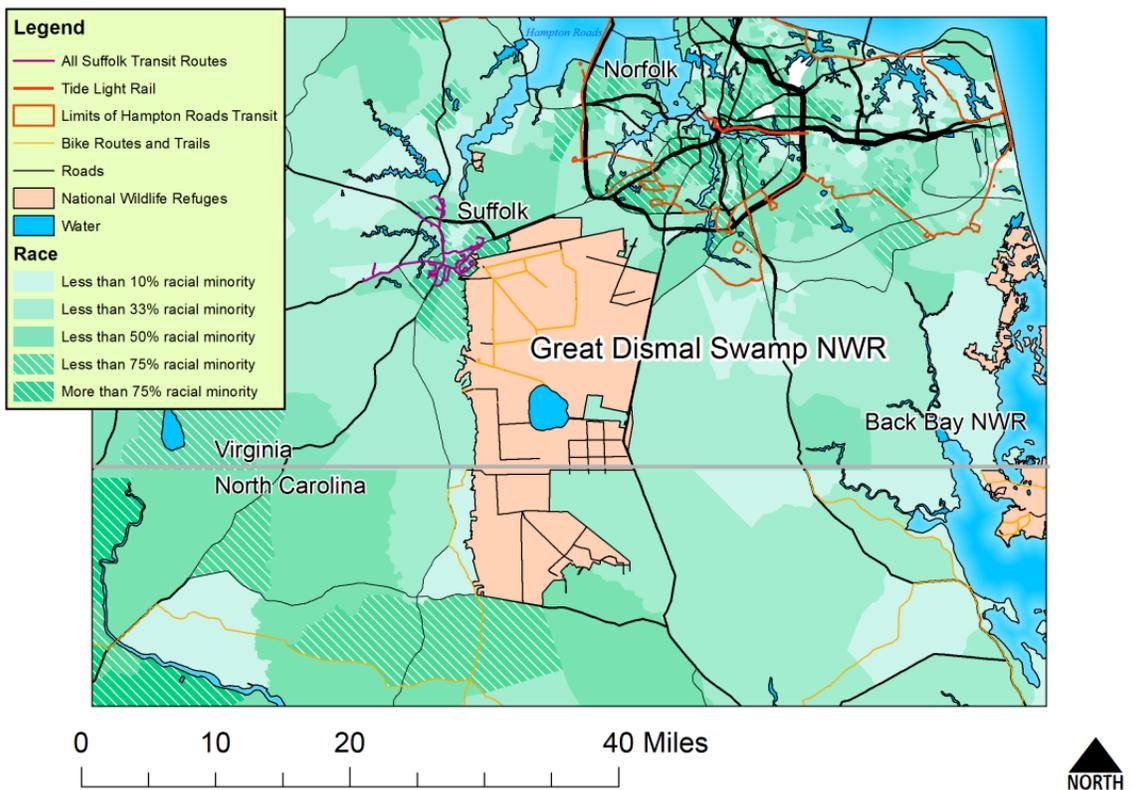


Figure 7: Vehicle Ownership and Accessibility to GDS NWR

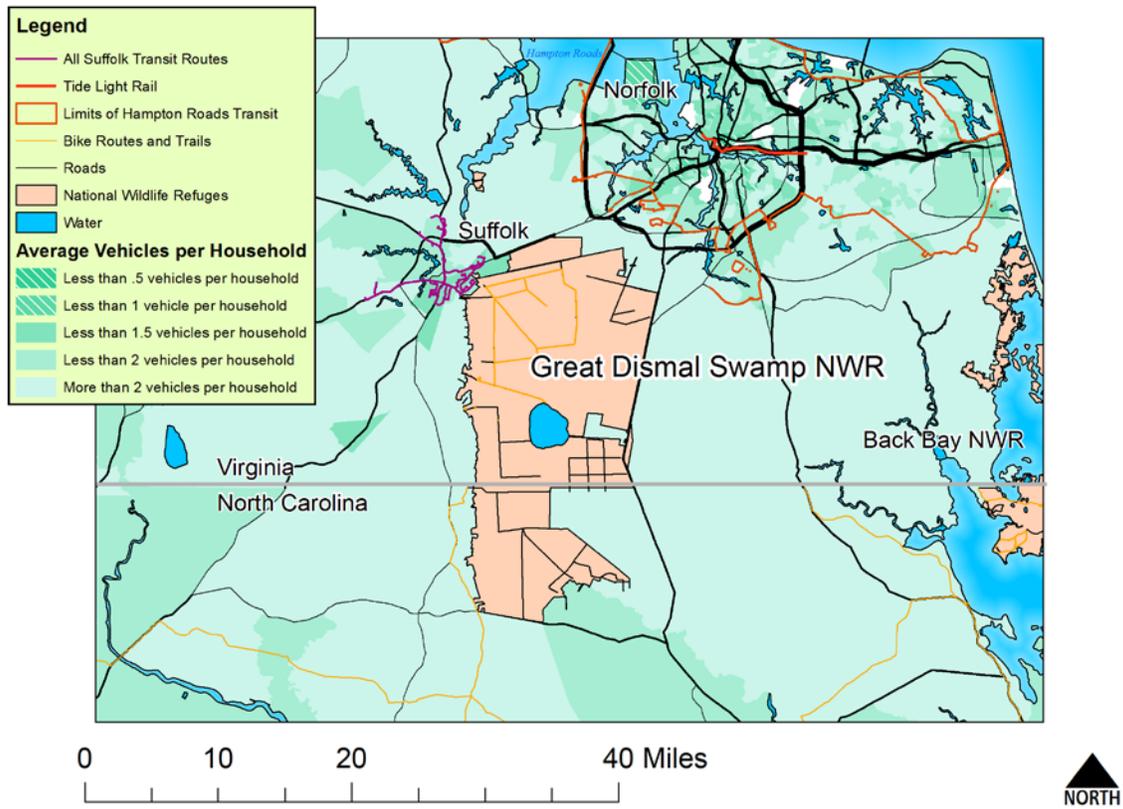
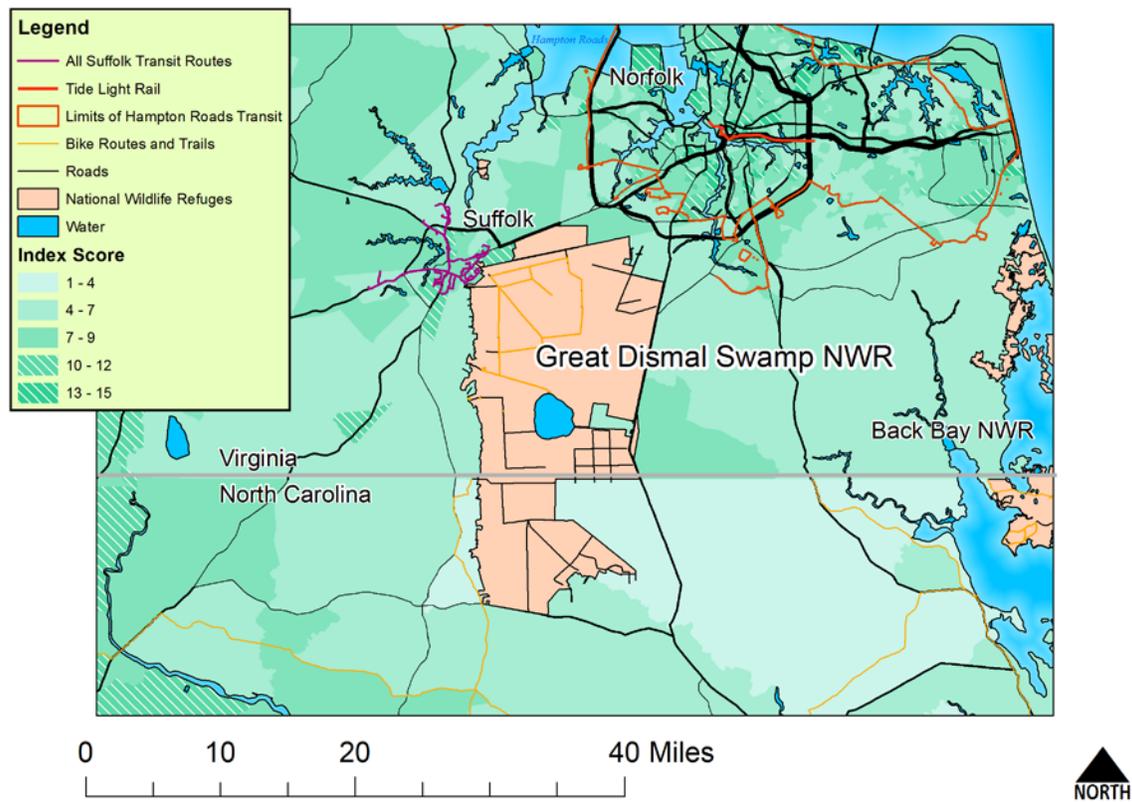


Figure 8: Indexed Demographic Variables for Underserved Populations and Accessibility to GDS NWR

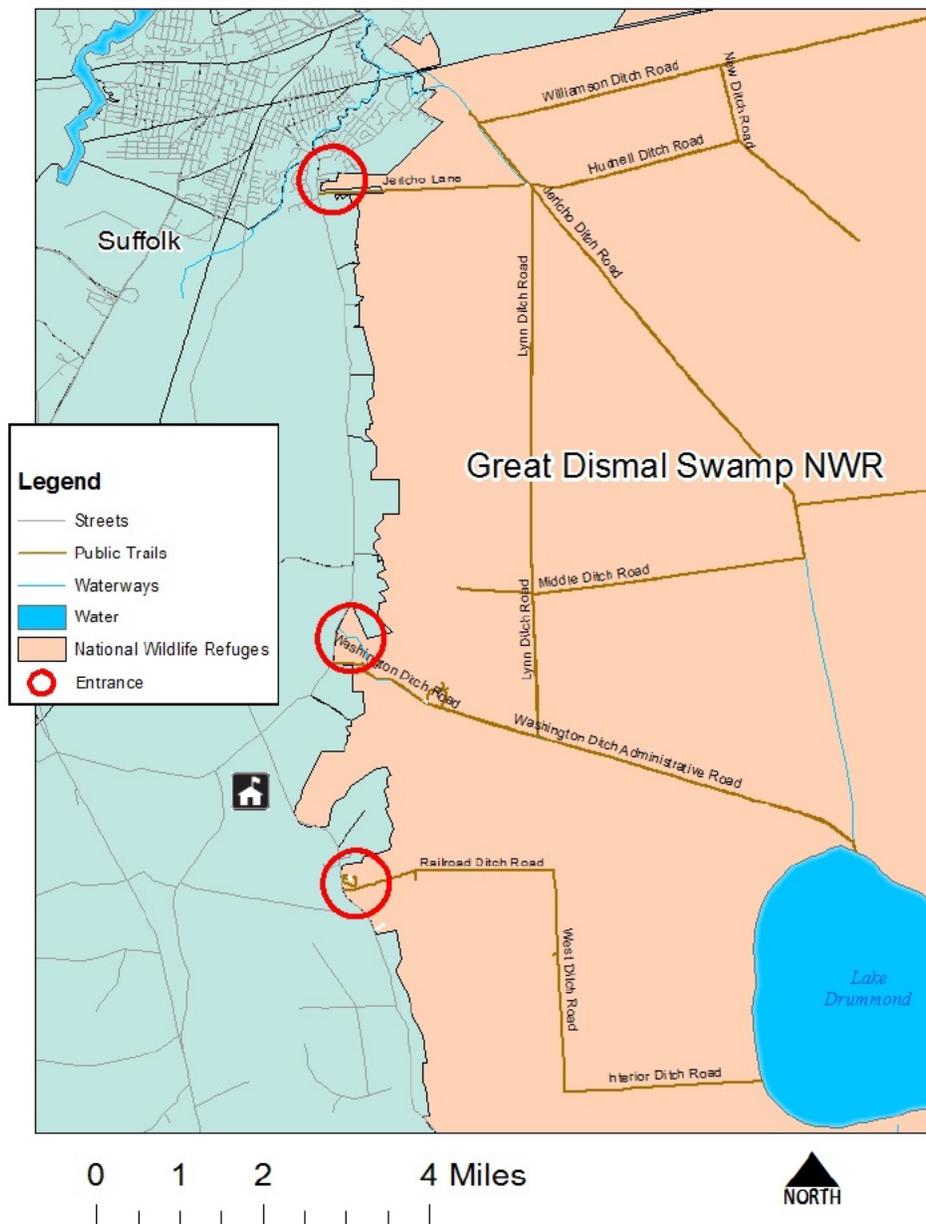


Transportation Issues/Problems

Suffolk

The Suffolk side of GDS NWR presents several transportation challenges. While there are a number of access points that lead to many miles of hiking and biking trails within the refuge, it is difficult to access these entrances without a personal vehicle. Figure 9 below shows greater detail of the refuge's access points on the Suffolk side. The identified Suffolk issues and needs are divided into private and public transit access, and bicycle and pedestrian access.

Figure 9: Detail of entry points on Suffolk side



Issues and Needs

Public and Private Transit

As explained above, the Suffolk side is where the majority of access points exist on the refuge. Most of the visitation to the refuge is by personal vehicle since public transit access as part of a regular route has yet to be established. The refuge has a tourism partnership with the City of Suffolk to run a naturalist tour through the refuge once a week between March and October. A more permanent public transit connection could relieve stress on congested refuge parking lots during peak hours of visitation. Particularly during special events, parking lots are pushed beyond their capacity.

The Virginia Regional Transit Authority (VRT) has a bus stop at White Marsh Plaza one-quarter of a mile away from the Jericho Lane entrance; however, no transportation partnership has been established between the agency and the refuge to develop an extension to the refuge. The White Marsh Plaza stop is part of the Orange Line that runs from downtown Suffolk to East Washington and costs \$1.50 each way or \$3.00 for a day pass. The bus runs weekdays hourly from 6:30 AM to 6:25 PM and makes a stop at White Marsh Plaza at the fifty minute mark. A hindrance to establishing convenient transit access is that Jericho Lane is not in good enough condition for a public transit vehicle to traverse (Figure 10). While direct public transit access to the interior of the refuge may be difficult due to the condition of surrounding gravel roads, it may be more feasible to have a transit stop nearby the refuge advertised as a bicycle or pedestrian access route to the refuge. However, limited funding and low ridership for existing VRT service impede service expansion considerations.

Figure 10: Jericho Lane conditions



Source: Volpe Center

An additional consideration for developing transit access is that the parking lots within GDS NWR are too small for many large-sized transit vehicles to turn around, particularly if spaces are already occupied with personal vehicles. The refuge has experienced problems with this when hosting local school groups coming to visit Lake Drummond. The school buses do not have enough room to turn around at the auto tour route parking lot causing problems for the school bus drivers. This issue limits the educational and interpretive experience of the refuge. Without the ability for the public to easily access the refuge via

public or private transit, personal vehicles will continue to be relied upon for primary access to and within the refuge and parking lot congestion will continue to be a problem.

Bicycle and Pedestrian Access

White Marsh Road and Desert Road, the two main roads providing Suffolk access, do not have sidewalks, bicycle lanes, or a shoulder to facilitate walking or bicycling to GDS NWR. Additionally, visitors have to travel a significant distance from the entrances along the refuge roads before reaching the parking area or other facilities (The distances to each parking facility are listed in Table 2 Entrances to Great Dismal Swamp NWR). Without a personal vehicle, using the refuge roads to access the trails requires a more demanding hike or bicycle ride than the average visitor would expect or prefer. Beyond the parking areas, the dirt and gravel ditch roads found in the interior of the refuge are primarily off-limits to vehicles; therefore, most land-based travel within the refuge utilizes bicycle and pedestrian modes. Due to the rough terrain of the unpaved roads, it is not favorable for road bicycling, but is a destination for local mountain bikers. At this time, the refuge does not own any bicycles to loan to visitors or utilize for interpretive biking tours to further directly promote the use of bicycling.

The promotion of bicycle use in the area can be done with a bicycle/pedestrian master plan, a document that the City of Suffolk does not currently have. Such a plan could help ensure these recreational activities are maintained and encouraged into the future. Inclusion of a sidewalk or bicycle route along White Marsh Road from the plaza to the Jericho entrance could facilitate walking or biking to the refuge from the bus stop. Additionally, the creation of a bicycle cooperative would help promote bicycling in the region and on the refuge.

Opportunities

Public and Private Transit

A year-round transit connection, particularly on weekends, could assist a range of local populations to more frequently visit the refuge while also reducing demand for the parking areas. A public transit connection with VRT is possible if funding and ridership needs are addressed. The City of Suffolk has expressed interest in discussing the refuge's needs for access by transit and how the city could coordinate with the refuge to determine what service would be feasible. The transit connection could be a short extension of VRT service to the Jericho Lane entrance to drop off bicyclists or pedestrians on the weekends. A longer extension of service to the Visitor Contact Center would increase the interpretive opportunities for visitors, but requires further funding and ridership analysis and planning.

Expansion of transit service comes with several challenges that would take time to address. For a short-term, less demanding approach, the refuge and its partners can promote the White Marsh Plaza stop as a bicycle and pedestrian access point to the refuge. VRT buses already have bicycle racks. With White Marsh Plaza only one-quarter of a mile away from the Jericho Lane entrance, bicyclists can ride two miles along the gravel roads to reach the many miles of ditch roads located further in the interior of the refuge that are closed to motorized vehicles. This route needs to be publicized to the surrounding community.

GDS NWR staff have existing relationships with some local groups to provide access to the Swamp in passenger vans, such as with the City of Suffolk and local schools. However, new relationships could be developed with other private or non-profit groups with transit options to further expand educational partnerships in Suffolk. Organizations with large capacity vans rather than school buses can transport students and other visitors to and around the refuge. General possibilities exist with church groups, senior centers, and the local chapter of the Boys and Girls Club. These local groups could provide transportation down to Lake Drummond via the Auto Tour Route in their large vans, alleviating the problems caused by buses. In reaching out to these groups, the local community, specifically youth,

could be introduced to the refuge and Lake Drummond without worrying about the size of the school bus.

Figure 11: Part of Lake Drummond parking facility, Source: USDOT Volpe Center



Source: Volpe Center

Bicycle and Pedestrian Access

Many opportunities exist to expand bicycle travel to and within GDS NWR. Developing a program for visitors to the refuge to borrow bicycles is among them. One of the few ways to access Lake Drummond is via a nine-mile round trip along Washington Ditch. While that is a challenging distance for walking, particularly with school groups, it provides a good bicycling route. School groups cannot be expected to bring students' bicycles; therefore, an on-site supply of bicycles would prove beneficial. Bicycling opportunities also exist near the Visitor Contact Station, such as to the recently built Underground Railroad Education Pavilion, which would be an enjoyable bicycling destination, as well as to Lake Drummond. Local opportunities for bicycle donations may exist with the City of Suffolk's Police Department and/or through founding a community bicycle collective or bike-share program. Bicycle collectives provide refurbished bicycles and educational bicycling programs to the local community, primarily targeting children and low-income populations. An organization like this could work closely with the refuge on bicycle provision and environmental education program development (Appendix B). Although there is no established bicycle collective in Suffolk, the refuge, FWS regional office, or FWS Headquarters could assist in forming one. With bicycle rental options scarce in Suffolk, provision of bicycles by the refuge or through a concession could greatly promote their use in the area and within the Swamp. Local bicycling partnership options should be examined more thoroughly since they could assist in promotion of bicycling activities on the refuge. Such partnership could also explore bicycle donation and free bike share options for the refuge.

Another opportunity for expansion of bicycle and pedestrian access is the creation of a "Biking for Birds" interpretive program during the refuge's annual Birding Festival. "Biking for Birds" is a program established at Two Rivers National Wildlife Refuge that could also be applied at GDS NWR.⁴ It is a

⁴ [Two Rivers National Wildlife Refuge "Biking for Birds" Program](#)

program that allows participants to cover more ground around the refuge and therefore offer greater birding opportunities. If resources permit, this program could be offered beyond the special birding event and become part of the interpretive experience at GDS NWR.

The refuge can also take advantage of the opportunity that no bicycle/pedestrian plan exists in the area and could assist in developing one. FLAP funds can be used to develop strategic plans, lessening the financial burden on the City of Suffolk. A bicycle/pedestrian plan would assist in the future development of active transportation infrastructure and increase connections to the refuge. A bicycle/pedestrian plan could also be a part of a larger regional plan that includes Portsmouth and Chesapeake. The refuge could be a part of a planning process as well as assist with investigating funding options for a plan. For example, if the City of Suffolk wished to submit an application for FLAP funding for the plan, the refuge could submit a letter of support as well as provide matching funds. The development and implementation of a Suffolk bicycle/pedestrian plan could address some of the non-motorized access issues through local endorsement, expansion of these outdoor connections and opportunities, and recommendation of funding sources.

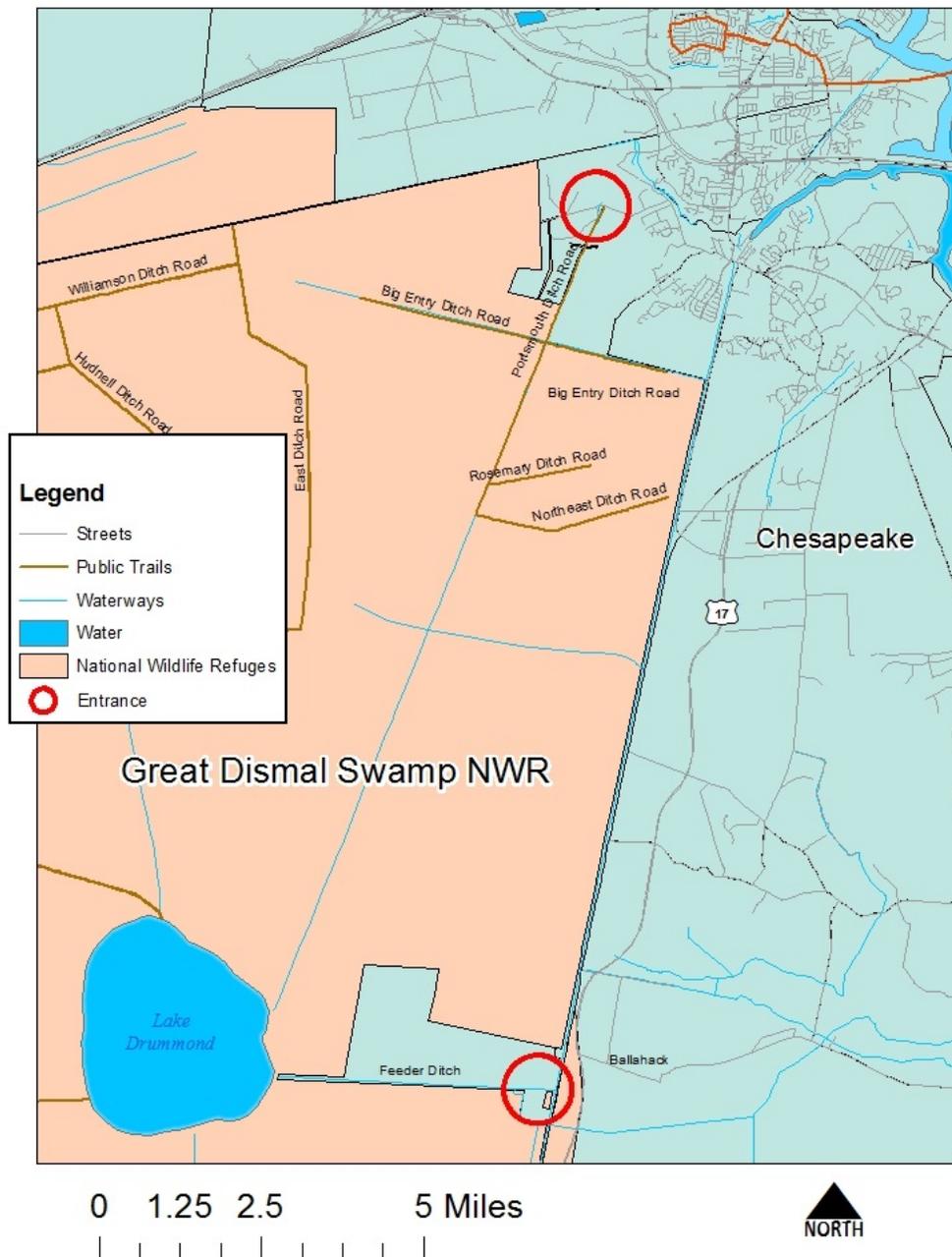
Educational Partnerships

John F. Kennedy Middle School is located on Lamb Avenue, northwest of Jericho Lane. Lamb Avenue is currently not a listed access point for the refuge, but could be improved to serve the adjoining neighborhood. The school yard is immediately adjacent to the refuge land. There is an opportunity for groups from the middle school to easily reach the northwest portion of the refuge for environmental educational and recreational purposes. Another local group located near the refuge is the Head Start Program with buildings in White Marsh Plaza. Refuge land borders Davis Boulevard, which is immediately across the street from the Head Start building. These opportunities, in addition to the partnerships described in the transit opportunities section, could enable the refuge to reach a broader audience of children/students and their families. Building educational partnerships would increase awareness of the Swamp and could lead to more frequent personal visits of local families.

Chesapeake

The main issue facing the Chesapeake side of the refuge is the lack of direct access. There are few opportunities for mobility within the refuge for hiking and bicycling trails to access Lake Drummond. However, access points for visitors need to be expanded. Figure 12 shows the Chesapeake side of the GDS NWR in greater detail. The Chesapeake issues and opportunities identified by the TAG team fall into four categories: access points and visibility, private and public transit, bicycle and pedestrian, and water-based access.

Figure 12: Detail of entry points on Chesapeake side



Issues and Needs

Access Points and Visibility

While the Chesapeake side of the refuge is in closer proximity to a large population and presents many opportunities for exposing diverse populations to the refuge, access to GDS NWR is hampered by a large barrier: the Dismal Swamp Canal. Due to this impediment, the only way to reach Lake Drummond from the Chesapeake side is by boat via the Feeder Ditch. Portsmouth Ditch is the only accessible roadway on the Chesapeake side of the Swamp. Its entrance is located in a residential community with a two mile gravel road to the first trails on the refuge. It is not well signed from the main roads and the long approach road is not conducive to pedestrian access from the local area. Additionally, a local hunt club owns land next to the parking area to store equipment and house their hunting dogs. This land does not look inviting and may make visitors feel that they are trespassing onto private property. There is a noticeable need for greater access to the refuge on the Chesapeake side so that residents and visitors may easily enter and visit the refuge. With so few access points, there is also a lack of interpretive material and kiosks and no Visitor Contact Station on this side of the refuge for visitors to learn more about the refuge's cultural and environmental significance.

Figure 13: Boat Dock on Canal Trail side of the Dismal Swamp Canal



Source: Volpe Center

Public and Private Transit

With limited refuge access points, there are few opportunities for transit services on the Chesapeake side and therefore no transit service or bus tour has been established. While the City of Chesapeake has a good relationship with the refuge, it cannot launch a bus tour to or within the Swamp without appropriate access points. Portsmouth Ditch is not currently in condition to receive transit vehicles and dropping passengers at the entrance on Martin Johnson Road is not a currently viable option because transit vehicles do not have a place to turn around. Hampton Roads Transit (HRT), the transit agency provider in Chesapeake, does not have any stops near the refuge; the closest is currently about four miles away. Personal vehicle access is limited to the Portsmouth Ditch. An additional parking lot or refuge facility on the east side of the refuge could serve as a transit service stop and visitor destination.

Bicycle and Pedestrian Access

The Dismal Swamp Canal Trail, managed by the City of Chesapeake, is a popular bicycling and pedestrian destination for locals that runs parallel to the eastern boundary of GDS NWR on the opposite side of the canal. Currently, there is no connection from this popular multi-use trail to the refuge. As mentioned in the existing conditions section, Chesapeake invested significantly in the trail and is interested in working with the refuge to find a way to connect the trail to the refuge land. However, there are challenges to building a bicycle and pedestrian bridge over the canal. As part of the Atlantic Intracoastal Waterway, the canal is maintained for water control, navigation and, to a certain degree, recreational use.

Navigation of the canal by boats must be maintained at all times, which creates challenges for building and maintaining bridges or other permanent infrastructure across it. If a drawbridge is built, that would require staffing the bridge during refuge operating hours. With limited staff and funding, this option presents significant problems. Alternative canal crossing options should be examined. There is also limited signage along the canal or trail. Existing signs indicate to trail users that the canal is a FWS boundary but do not name the Great Dismal Swamp as the National Wildlife Refuge that is located on the other side.

Portsmouth Ditch provides access to a few ditch roads open to non-motorized transportation extending into the interior of the refuge.⁵ Portsmouth Ditch has some parking to accommodate visitors who wish to park and bike or hike. Once Portsmouth Ditch is reconstructed in 2016, it could become a popular mountain biking attraction for visitors. The interior bicycle and pedestrian trails reached via Portsmouth Ditch are less popular and less well-known than trails found on the Suffolk side. The low use of these trails may be due to lack of awareness and the fact that none of the trails provide access to Lake Drummond.

Water-Based Access

The refuge allows boats to be launched on Lake Drummond from April 1st to June 15th via the Auto Tour Route parking lot. Another option for water-based access to the refuge and to Lake Drummond is through the Feeder Ditch. The USACE manages the Feeder Ditch and keeps it open year-round for boaters. Access to Lake Drummond by the Feeder Ditch is hampered slightly by the presence of a weir that regulates water levels. Boaters must use the boat tram⁶ or portage their boat around the spillway to access the lake (see Figure 14). There is no option currently to dock at the weir and hike to the lake since there is no land trail along the Feeder Ditch.

Figure 14 Kayak on boat tram at Lake Drummond



Source: <http://focusonhamptonroads.squarespace.com/lake-drummond>

⁵ The public access portion of Portsmouth Ditch ends at the junction with the Northeast Ditch. The public does not have access to Lake Drummond along the southern portion of Portsmouth Ditch.

⁶ A boat tram is a device used to pull boats over the weir. It has a maximum capacity of 1,000 lbs.

Visitors can use canoes, kayaks, and other shallow, non-commercial vessels on Lake Drummond. However, the only place for boats to dock within the refuge is at the boat launch at the end of the Interior Ditch road on the west side of Lake Drummond. Other ditch roads in the northeast section of the refuge, such as Big Entry Ditch and Northeast Ditch, are in close proximity to the canal but do not have boating access from the canal.

Opportunities

Access Points and Visibility

GDS NWR has several opportunities to expand the number of access points on the Chesapeake side and create a destination for visitors coming in from the east. The City of Chesapeake recently constructed a restroom, boat launch and parking lot facility along the Dismal Swamp Canal Trail adjacent to Route 17 (Figure 15). The City was awarded FLAP funding in March 2014 to begin parking lot improvements at the Ballahack boat ramp at the southern end of the canal trail. With these improvements adjacent to the refuge, there is an opportunity for expanding access and outreach to the public. By working with Chesapeake, GDS NWR could add directional and educational signage as well as interpretive materials along the trail so more canal visitors become aware of the refuge, especially water access through the Feeder Ditch.

Figure 15: Dismal Swamp Canal Trail new boat launch



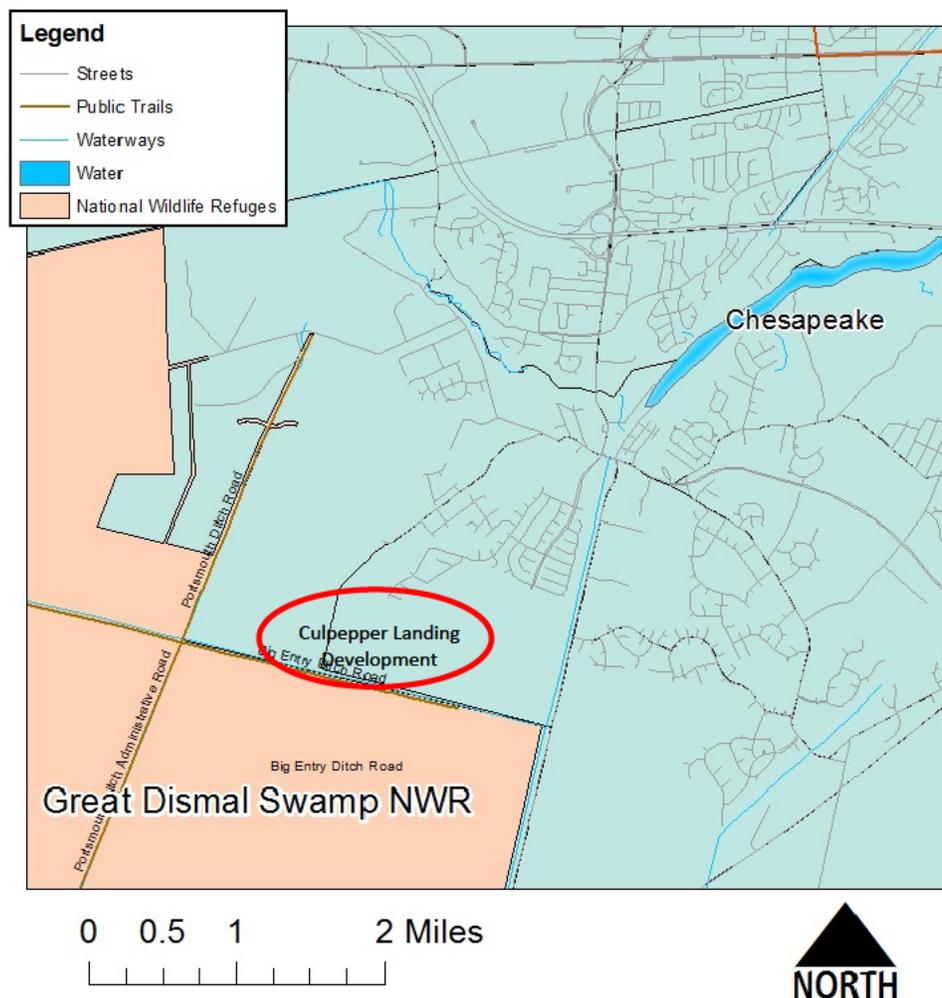
Source: Volpe Center

With the City of Chesapeake's newly built infrastructure along Route 17 and in close proximity to the refuge, it is important that the refuge continue to build upon its relationship with the City to increase refuge visibility and accessibility. These new facilities not only present an opportunity to expand awareness, but also may serve as a potential location for the Chesapeake side's Visitor Contact Station. As recommended in its Comprehensive Conservation Plan, a Visitor Contact Station along Route 17 would increase refuge exposure, create a visitor destination, and provide for greater interpretive opportunities. The refuge does not own sufficient land on the eastern side of the canal and therefore would have to purchase land from private landowners to build any facilities. If GDS NWR is able to acquire the land, it could build a Visitor Contact Station near the City's recently expanded parking area and rest facilities, a naturally central location for the GDS to locate. The Virginia Department of Game

and Inland Fisheries, USACE, GDS NWR, and the City of Chesapeake discussed creating a building that has office and educational facilities for all partners, but no formal plans have been developed.

Another opportunity for an access point that was mentioned during the TAG visit is the Culpepper Landing development located along the north side of Big Entry Ditch and on the west side of the Dismal Swamp Canal (Figure 16). The developers have interest in building a crossing over the canal to connect the development to the Dismal Swamp Canal Trail. The refuge had discussions with the landowner regarding a possible pedestrian bridge over Big Entry Ditch into GDS NWR. The City owns a right of way on the north side of the Big Entry Ditch as part of a future location for a bypass project. City representatives at the TAG meeting stated they would like to create a parking area on their right of way at the pedestrian bridge to allow visitors to access many miles of recreational trails. If a Visitor Contact Station is built at the north end of the canal trail, it would be an easy 2.5 to 3 mile bike ride from that location to the proposed Big Entry Ditch pedestrian bridge. GDS NWR should continue coordinating with the City of Chesapeake and the landowner on this new access point.

Figure 16: Culpepper Landing Development location



Private and Public Transit

The opportunity to develop a transit service connection to the refuge is dependent upon the creation of a convenient parking or drop-off facility as well as funding availability. The City of Chesapeake parking lot facility within the proposed Culpepper Landing Big Entry Ditch pedestrian bridge could act as a private or public transit stop. The location is ideal for a transit service stop as it does not require the buses to drive down unpaved roads and could provide easy access to numerous miles of bicycling and

hiking trails. Additionally, HRT would not have to expand its service too far south from its current service area. Residents of the new development could also benefit from having public transit at their doorstep and might contribute to needed route ridership. Of course, any expansion of HRT services, especially those operating through private developments, requires the approval of the City of Chesapeake. With the City's permission, private tours or educational groups could also use this parking lot to discover the recreational and environmental opportunities at the Swamp.

The second potential transit access point mentioned during the TAG is the possible Visitor Center site along Route 17. With a Visitor Contact Station at this location, the Dismal Swamp Canal Trail's northern trailhead parking facility would be a more attractive destination for local people and visitors. This opportunity was discussed in the past and participants in the TAG meeting supported the idea; however, no plans have been formalized. Transit service to that parking lot would benefit both the City of Chesapeake as well as the refuge by increasing the use of these recreational and educational facilities.

Bicycle and Pedestrian Access

Due to the inability to cross the canal, bicyclists and pedestrians do not have access to the refuge on the Chesapeake side except via Portsmouth Ditch. The most promising opportunity for expanded bicycle and pedestrian access across the canal is the proposed bridge over the canal at the Culpepper Landing development near the northeast corner of the refuge and leading to better Refuge access. If this bridge does not come to fruition, then the refuge should explore other options for access across the canal. It would be challenging for the refuge to staff and operate a bridge across the canal, but opportunities exist for self-service traversal of the canal and there are examples of this at other Federal public land units (Appendix B). This opportunity would allow visitors to cross the canal without the monitoring of refuge staff. If access is established across the canal, the refuge would have the opportunity to expand recreational activities on the eastern side of the refuge.

As mentioned, the only current bicycle and pedestrian access is through Portsmouth Ditch. While there are plans to reconstruct this road and improve facilities at the trail entrance in 2016, this entrance could benefit from greater directional signage as soon as possible. After the completion of improvements, there will be more opportunities to expand the use of Portsmouth Ditch to active transportation. For instance, GDS NWR recently acquired a portion of land immediately west of the Portsmouth Ditch that it may develop with one or two loop trails. These trails will create more hiking, biking, and wildlife viewing opportunities on the two-mile access road. Of course, increasing awareness of the new recreational opportunities at Portsmouth Ditch should be a priority for the refuge following the refurbishments.

Water-Based Access

With the improvements occurring along the Dismal Swamp Canal Trail, the refuge is presented with several opportunities to expand its water-based access and visibility. The completion of the northern trailhead parking lot and boat ramp provides an opportunity for more residents and visitors to go boating on the canal. Improved signage making boaters aware of Feeder Ditch access to Lake Drummond would be valuable to getting more visitors inside the Swamp and potentially exploring the refuge from the Interior Ditch. As previously mentioned, Chesapeake already secured funding to improve the Ballahack boat ramp parking area and add a rest facility. The City is also considering an additional FLAP application to straighten the boat ramp to allow larger boats to enter the canal at this location. Since the Ballahack boat ramp is located within a half of a mile of the Feeder Ditch entrance, the upcoming and proposed improvements at this site will further encourage water access to the Feeder Ditch and provide an opportunity to promote the refuge. USACE has some permitting and environmental concerns surrounding the expansion or altering of the Ballahack boat ramp that would need to be addressed as the FLAP application is developed.

Increasing boater usage of the Feeder Ditch presents some problems for the USACE since they must dredge the ditch as well as assist larger boats passing through by maintaining the boat tram. Continued

coordination with USACE regarding Feeder Ditch management and best practices is necessary if visitation increases. To minimize problems for USACE if Feeder Ditch usage increases, the refuge, USACE, and City of Chesapeake may want to explore concessionaire boat tour options from the canal to Lake Drummond. Some boat tour companies have expressed interest in doing this, but proper launching facilities are necessary. It could be worthwhile for the refuge to follow up with partners to discuss the feasibility and best options moving forward so a boating concessionaire can be accommodated. Additionally, development of a foot trail from the weir to Lake Drummond could alleviate some demand on the boat tram and achieve a portion of the four mile Feeder Ditch pedestrian and bicycle trail that is recommended in the refuge's CCP.

A small boat landing along the refuge's boundary on the Dismal Swamp Canal would greatly increase water-access as well as utilization of trails located on the northeastern side of the refuge. As long as such a landing does not interfere with management of the canal and the passing of other boats, there should not be many barriers to adding a landing on refuge land from the canal. A potential issue may be the strict permitting and zoning policies to which the USACE must adhere; however, as long as any developments along the canal are not planned on USACE property there should be limited regulatory problems. One such opportunity for a boat landing is the slough near the Northeast Ditch. If formalized, the slough could serve as a docking location for kayaks or canoes. This docking location would then connect visitors to hiking trails in the northeast corner of the refuge. Developing this small landing area would require minimal funding and the City of Chesapeake expressed interest in supporting the project by submitting a FLAP application.

Regional

Issues and Needs

Residents of Suffolk, Chesapeake, and greater Hampton Roads area are aware that the Great Dismal Swamp is located in their communities; however, it appears that the majority of local residents do not know about all of its environmental education and recreational resources. As refuge staff noted, the majority of visitors that contact the refuge staff are not locals. This indicates there is a potential disconnect in communication between the refuge and local organizations and institutions. While visitors from outside of the area are always valued, relationships with local residents provide the greatest support and stability for a refuge. The refuge staff have strong working relationships with a number of local organizations and government offices. In order for GDS NWR to become a more integral part of the regional community and resource for local residents, greater communication and coordination with the local communities is required.

Related to the need for greater communication about opportunities at the refuge is the need for greater opportunities to access the refuge, specifically by public transit, bicycle, and water. There is a significant regional population of households that are lower income and do not own a vehicle. Many live within about ten miles of the refuge but have no viable travel options for reaching it. Neither VRT in Suffolk or HRT in Chesapeake/Norfolk provide direct bus access to the refuge on a permanent schedule. There is also no connectivity between the two services. A person traveling from Chesapeake would not be able to reach the Visitor Contact Station on the Suffolk side of the refuge by public transportation. Furthermore, the region does not have a comprehensive bicycle plan that identifies existing bike lanes or preferred road routes for bicyclists. The East Coast Greenway, which is a system of 2,900 miles of bicycle trails and routes that runs from Maine to Florida, includes some on-road routes on their maps of the area but it does not show all local routes. It identifies the refuge's location, but does not currently identify or recommend routes within the refuge. Public transportation and bicycle travel is critical for increasing access to GDS NWR and requires coordination among regional stakeholders.

GDS NWR would like to work with some schools to create an outdoor classroom experience, especially with Lake Drummond in the curriculum for fourth graders. Most of the schools that already come visit the refuge are within the close proximity and are based on long standing relationships with teachers. The benefits of environmental education outreach could reach further out into the region with expanded coordination and networking. Expanding environmental education is part of the refuge's CCP and remains a focus for staff. However, environmental education outreach is limited by staff resources and school bus access. These issues need to be addressed before expanded outreach and environmental education opportunities can be achieved.

Opportunities

A key benefit of the TAG meeting is bringing stakeholders face to face to discuss issues and ways in which they can address them. A number of new relationships were established and old relationships reaffirmed during the meetings. The refuge will continue communications with stakeholders to spread the word about the resources the refuge has to offer the local communities. Refuge staff are also eager to develop relationships with new groups identified, such as the military bases nearby, community colleges, other educational institutions, bicycle groups, and others.

GDS NWR has an opportunity to become engaged in local and regional planning efforts. The Hampton Roads Transportation Planning Organization is currently working on a long range transportation plan. It expressed interest in including bicycle and pedestrian projects related to refuge access. Representatives from both Suffolk and Chesapeake seemed willing to work together to create a regional bicycle plan if funding for the effort could be found. Such funding could be possible through the next round of Virginia's Federal Lands Access Program grants, for which the next round of applications are expected to

open in spring or summer 2014. GDS NWR can sign a letter of support for the application and be involved in development of the plan. In addition to expanding bicycle and pedestrian access, by increasing engagement with regional transportation stakeholders, the refuge can also seek to expand transit connections to the refuge.

Education outreach opportunities are dependent in part on additional staff capacity at the refuge. One opportunity to expand staff capacity is for the refuge to apply for a transportation scholar: a recent masters or doctoral graduate in a transportation-related field selected in a competitive process and assigned to work at a refuge or regional office for ten months. The refuge indicated they could provide housing for the scholar, one requirement for participation in the program. A transportation scholar could assist refuge staff in reaching out to schools to develop programs and to local organizations that have small transit vehicles or large vans which could facilitate access to Lake Drummond for schools and other groups.

Analysis and Recommendations

After completing a comprehensive site visit, tour of significant transportation nodes, and meeting with stakeholders, the TAG team discussed and analyzed significant issues facing GDS NWR. A set of short- and long-term recommendations were developed to address Suffolk, Chesapeake, and regional concerns. Suffolk and Chesapeake have different recommendations as each city presented distinct challenges; however, the TAG team recognized that there are some issues that would benefit from regionally-coordinated efforts. The short-term recommendations are immediate action items the refuge can undertake to enhance its transportation network. The long-term recommendations have a longer timeline as they may require more in-depth study, analysis, and funding. Most recommendations involve developing, expanding, and facilitating non-private vehicles transportation modes to and within the Swamp as well as increasing local marketing of GDS NWR.

Suffolk

Suffolk presented several opportunities for GDS NWR to expand its transit and active transportation access. The following recommendations take advantage of the established access points and many miles of ditch roads and trails on the Suffolk side of the Swamp. Additionally, most of these recommendations rely on developing and formalizing transportation partnerships within the Suffolk community and local government.

Short-term (1-3 years)

Create “Ride and Bike” from White Marsh Plaza VRT stop

As discussed earlier in the report, the VRT stops at White Marsh Plaza, only one-quarter of a mile from the entrance of Jericho Lane. By partnering with the City of Suffolk, VRT, and local bicycle organizations, the refuge can publicize and encourage White Marsh Plaza as a bicycle access point to GDS NWR.

Incorporate “Biking for Birds” at Annual Birding Festival

While this additional activity during the Birding Festival may require more volunteers or the establishment of a bicycling partnership with a local organization, this is something the refuge could add to next year’s Birding Festival agenda. “Biking for Birds” will expose a wider audience to the biking and birding opportunities available around the Swamp. If resources permit, this program could be offered beyond the special birding event and become part of the interpretive experience at GDS NWR.

Improve access for education institutions and community groups

The refuge can further connect area schools and community groups to the refuge by partnering with organizations with extra capacity in their van pools. Senior centers, church groups and the local Boys and Girls Club may have large capacity vans that can bring groups to the refuge on weekends or hours when their vehicles are not typically in use. Unlike school buses, these vehicles do not have difficulty turning around at the Lake Drummond parking area like school buses do. The refuge can also develop access points at Lamb Avenue and Davis Boulevard to facilitate access for nearby schools, such as John F. Kennedy Middle School and Head Start.

Improve signage

There is a lack of directional and permitted activity signage in areas surrounding and within the refuge on the Suffolk side. Specific areas identified were:

- Auto Tour Route entrance to notify visitors that the Visitor Contact Station is not located there
- Northbound traffic coming from North Carolina on Desert Road
- Symbols identifying available activities

- Signage along Route 58 boundary to increase awareness of the refuge

Coordinate with the City of Suffolk Parks and Recreation Department on new Master Plan

The City of Suffolk Parks and Recreation Department is currently developing a Master Plan and has expressed interest in having the Refuge participate as a stakeholder. Increased collaboration between the two agencies will help create seamless transportation options in the area for outdoor recreation.

Long-term (3-6 years)

Coordinate with City of Suffolk about VRT service to refuge

To justify the expansion of transit service to the Jericho Lane entrance, and potentially further south to the Visitor Center, GDS NWR would need to show ridership demand potential as well as alternative funding opportunities. This service could benefit from a Federal Lands Access Program award. Maintaining a dialogue with the City of Suffolk and VRT to possibly implement a pilot weekend transit service to either or both of those locations could lead to a permanent service to the refuge.

Research concessionaire opportunities for bicycle and boat rentals

The refuge’s CCP suggests that if a new Visitor Contact Station is built on the Chesapeake side, the current Visitor Contact Station on the Suffolk side could be remodeled to be a Visitor Services Station.⁷ In this building, a concessionaire or partnership could allow bicycle and boat rentals to expand visitor recreational and educational opportunities. As mentioned previously, a supply of on-site bikes would encourage their use around the refuge. Having a concessionaire, or potentially a local bicycle cooperative, provide this service would alleviate some of the stress on limited refuge staff and financial resources.

Create a “Park and Bike” Lot on Jericho Lane near White Marsh Road

The refuge owns some land adjacent to the entrance of Jericho Lane just off of White Marsh Road. This land could be developed into a parking area for cyclists to enter the refuge. It would relieve pressure on the existing parking area at the end of Jericho Lane by the pavilion and rest room facilities. It could also be used as a drop off and turn around point for transit vehicles depending on the size of the lot.

Chesapeake

With much development occurring nearby, the refuge has several concrete opportunities to benefit from on the Chesapeake side. The recommendations focus on capitalizing on existing infrastructure as well as looking at ways to build new facilities. With only one land-based access point, it is a high priority of the refuge to establish more ways for visitors and residents to experience and utilize the Swamp. The short-term recommendations are more tangible, whereas the long-term recommendations have greater external implications.

Short-term (1-3 years)

Build a Northeast Ditch landing

Formalizing the slough along the canal bank next to the Northeast Ditch will enable the refuge to develop direct and convenient water-based access. Chesapeake stakeholders expressed interest in developing this landing, as lack of water-based access to the refuge is a significant problem. GDS NWR could support the City of Chesapeake in submitting a FLAP application to potentially provide funding for the construction of a small landing area.

⁷ [Great Dismal Swamp NWR CCP 2006](#)

Submit FLAP application for Ballahack boat ramp realignment

The recently awarded FLAP funds do not cover the realignment of the Ballahack boat ramp; the funds can only be applied to parking lot and restroom facility improvements. An additional FLAP application from the City of Chesapeake with letters of support from the refuge and USACE to support the realignment of the boat ramp would increase usage and water-based accessibility to Feeder Ditch.

Examine the construction of a Feeder Ditch foot path

The refuge can facilitate access between the Feeder Ditch weir and Lake Drummond by creating a foot path between the two locations. The CCP calls for a full four mile pedestrian and bicycle trail along the Feeder Ditch. A foot path would be an efficient start to such a facility and help the refuge gauge interest in foot access to Lake Drummond, while reducing demand on the weir as boat traffic increases.

Explore Big Entry Ditch access options from Culpepper Landing

While the actual development of the parking lot may take longer than the other short-term recommendations, building a stronger partnership with the City of Chesapeake and confirming the possibility of a parking lot near Big Entry Ditch can happen in the short-term. Additionally, the refuge should monitor the progress of Culpepper's possible bicycle and pedestrian bridge over the canal. If these plans fall through, the refuge will need to explore other opportunities in establishing bicycle and pedestrian access across the canal.

Improve signage and marketing

There are a couple of noteworthy areas where marketing and signage can be improved to provide the public with better directions and general awareness of the refuge.

- Signage and kiosks along the Dismal Swamp Canal and Trail
- Directional signage on Martin-Johnson Road leading to the Portsmouth Ditch entrance

Long-term (3-6 years)

Build Visitor Center along Route 17

There must be a reason for refuge visitors to come to the Chesapeake side of the refuge. Currently, the only opportunities for visitors to engage with the refuge from Chesapeake are via Feeder Ditch on a boat or personal vehicle at Portsmouth Ditch. There is no interpretive or educational element on the eastern side of the refuge. The addition of a Visitor Center along Route 17 would provide an anchor for the refuge on the east side and give GDS NWR flexibility for creating concessionaire agreements on both sides of the Swamp. As recommended in its CCP as well as the Region 5 RATE, the TAG team also recommends pursuing plans to construct a Visitor Center near the northern trailhead facilities recently completed by the City of Chesapeake.

Examine HRT service connection

This recommendation relies on the establishment of an additional access point to serve as a drop-off location. This access point can either be at Culpepper Landing or the parking lot of the future Visitor Center site. Public transit connections are important to serve the carless populations surrounding the refuge. HRT follows the direction of the City of Chesapeake, so continued partnerships with both are necessary to identify future potential for a transit stop. To address any funding issues, FWS or FHWA EFL may be able to provide funding for transit service.

Research concessionaire opportunities on Dismal Swamp Canal and Lake Drummond

Chesapeake Tourism has already been approached by boat tour companies interested in establishing a tour along the Dismal Swamp Canal. These discussions have been hindered by the lack of adequate meeting point and launch facilities. With the parking and restroom

improvements at Ballahack and the potential realignment of the boat ramp, the canal will be attractive to concessionaires. The refuge should stay involved in these discussions as a concessionaire along the canal may want to make Lake Drummond part of that tour. Concessionaires can also provide interpretive and educational opportunities during their tours.

Regional

Short-term (1-3 years)

Consider marketing and communications issues in planned visitor service review in 2014

GDS NWR is currently conducting a thorough review of visitor services. The marketing and communications issues that were raised during the TAG meeting and resulting recommendations should be considered and incorporated into the visitor services review to the degree possible.

Assist with creation of a Coordinated Regional Bicycle and Pedestrian Plan

The refuge should coordinate with relevant representatives from Suffolk, Chesapeake, Portsmouth, and regional planning offices to develop a FLAP grant application to fund a regional bicycle and pedestrian plan. Development of the plan should also engage local biking organizations for input and potential partnerships. The application must come from the localities but GDS NWR could provide a letter of support and contribute to the plan where appropriate. Virginia is expecting to announce another round of applications in spring or summer of 2014.

Assist in creation of a bicycle cooperative in the region

The refuge can assist with the formation of a bicycle cooperative in the region. This group can provide bicycle safety training, bicycle rentals, and bicycle rides through GDS NWR.

Coordinate with East Coast Greenway and Hampton Roads Transit to incorporate GDS NWR onto their respective maps – as well as other organization maps

Refuge staff should provide relevant GIS mapping layers, such as refuge boundary and ditch roads files, to Hampton Roads Transit and East Coast Greenway representatives. These maps are well used by local, regional, and long-distance visitors and provide a frame of reference and context for the refuge as an available resource to the public. Other opportunities to include refuge resources on other local maps can be explored.

Develop a communications and marketing plan for the refuge

GDS NWR would benefit from having a strategic communications and marketing plan as a guide for engaging existing and new stakeholders in the regional area. The plan would establish objectives and goals for expanding coverage of marketing and messaging and establish some measureable outcomes. It could list targeted audiences, such as underserved populations, military base families, education institutions, and local non-profits. The plan could also include new messaging mechanisms such as Quick-Response (QR) codes on kiosks and brochures, YouTube videos, and Twitter and Facebook posts on the refuge and Friends Group websites.

Pursue a transportation scholar to assist with implementation of local and regional recommendations

A Public Lands Transportation Scholar is a recent masters or doctoral graduate on a ten month fellowship through the Federal Transit Administration (FTA). The scholar assigned to a refuge lives at or near the refuge and assists refuge staff in developing alternative transportation solutions. A transportation scholar at GDS NWR would be invaluable to the refuge in starting to implement the recommendations from this TAG report.

Appendix A: TAG Participants

Transportation Assistance Group (TAG)

Nathan Caldwell, Trails and Transit Coordinator, FWS

Jeffrey Mast, Refuge Transportation Coordinator, FWS Region 5

Christoph Jaeschke, Planning Engineer, Federal Lands Highways – Eastern Division

Heather Richardson, Community Planning, USDOT Volpe Center

Lauren Deaderick, Economist, USDOT Volpe Center

U.S. Fish and Wildlife Service: Great Dismal Swamp National Wildlife Refuge (GDS NWR)

Chris Lowie, Refuge Manager

Cindy Lane, Deputy Refuge Manager

Deloras Freeman, Visitor Services Specialist

Stakeholders

Susan Drewery, Chesapeake Convention and Visitor Bureau

Sherry Earley, Suffolk Public Works

Arkopal Goswami, Hampton Roads Transportation Planning Organization

Randy Keaton, Hampton Roads Planning District Commission

Randall Woodruff, Hampton Roads Transportation Planning Organization

Katie Kelley, Suffolk Tourism

Eric Martin, Chesapeake Public Works

Joe Morgan, East Coast Greenway

Samantha Sink, Hampton Roads Transit

Joel Scussel, US Army Corps of Engineers

Nicole Woodward, US Army Corps of Engineers

Mike Kelly, City of Suffolk Parks and Recreation Department

LJ Hansen, Virginia Roads Transit

Appendix B: Supporting Documents and Resources

Bike Collective Information

- <http://www.bikecollectives.org>
- www.thebikedepot.org/
- <http://www.toledobikes.org/>

Great Dismal Swamp NWR

- [GDS CCP, July 2006](#)
- [Region 5 RATE](#)
- [FWS Urban Wildlife Refuge Initiative Fact Sheet](#)

FHWA Surface Transportation Funding Programs

- [Moving Ahead for Progress in the 21st Century Legislation](#)
- [Federal Lands Access Program Guidance](#)
- [Federal Lands Transportation Program Guidance](#)
- [Transportation Alternatives Program Guidance](#)

Suffolk

- [City of Suffolk Department of Public Works – Transit Homepage](#)
- [Virginia Regional Transit](#)

Chesapeake

- [City of Chesapeake Department of Public Works](#)
- [Route 17/ Great Dismal Swamp Corridor Study](#)
- [Hampton Roads Transit](#)

Regional

- [Virginia Department of Transportation – Transportation Alternatives Program and Transportation Enhancements](#)
- [USACE Intracoastal Waterway](#)
- [East Coast Greenway - Virginia](#)

Appendix C: TAG Meeting Agendas

Suffolk

Wednesday, 3/19 9:00 AM – 3:00 PM

Location: Great Dismal Swamp NWR Visitor Center 3100 Desert Road Suffolk, VA 23434

9:00-9:15 Welcome and introductions

9:15-9:30 Purpose of Visit / “TAG”

- Identify transportation-related issues at the Refuge and in neighboring “gateway” communities
- Discuss stakeholder interests and how transportation solutions may be mutually beneficial
- Integrate alternative transportation solutions into FWS Northeast Region (Region 5) Long-range Transportation Plan (LRTP)
- Identify specific projects for potential funding (i.e. through the Federal Lands Access Program, or FLAP)
- Focus on ways to bring more area residents to the refuge – information and transportation solutions

9:30-9:45 Refuge Overview and Access

- Refuge purpose
- Refuge activities – fishing, boating, hiking, bicycling, wildlife observation, Lake Drummond, historical attractions
- Access points and methods

9:45-10:30 Transportation-related interests/issues/concerns

10:30-10:45 Break

10:45-11:45 Potential solutions/recommendations/partnership opportunities/challenges

11:45-12:00 Wrap-up and next steps

12:00-1:00 Lunch

1:00-3:00 Tour Refuge – west-side areas, entrances, access points and approaches in town

Chesapeake

Thursday, 3/20 8:00 AM- 1:00 PM

Location: Chesapeake Regional Airport 2800 Airport Drive, Chesapeake, VA 23323

8:00-8:15 Welcome and introductions

8:15-8:30 Purpose of Visit / “TAG”

- Identify transportation-related issues at the Refuge and in neighboring “gateway” communities
- Discuss stakeholder interests and how transportation solutions may be mutually beneficial
- Integrate alternative transportation solutions into FWS Northeast Region (Region 5) Long-range Transportation Plan (LRTP)

- Identify specific projects for potential funding and partnerships (i.e. through the Federal Lands Access Program, or FLAP)
- Focus on ways to bring more area residents to the refuge – information and transportation solutions

8:30-8:45 Refuge Overview and Access

- Refuge purpose
- Refuge activities – fishing, boating, hiking, bicycling, wildlife observation, Lake Drummond, historical attractions
- Access points and methods

8:45-9:30 Transportation-related interests/issues/concerns (include maps to mark up)

9:30-9:45 Break

9:45-10:45 Potential solutions/recommendations/partnership opportunities/challenges

10:45-11:00 Wrap-up and next steps

11:00-1:00 Tour Refuge – east-side areas, entrances, access points and approaches in town
