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2.1 GEOGRAPHY AND DEMOGRAPHY

This **section** of the referenced DCD is incorporated by reference with the following departures and/or supplements.

STD DEP 1.1-1 **Subsection 2.1.1** of the DCD is renumbered as **Subsection 2.1.4** and moved to the end of **Section 2.1**. This is being done to accommodate the incorporation of RG 1.206 numbering conventions for **Section 2.1**.

2.1.1 SITE LOCATION AND DESCRIPTION

PTN COL 2.1-1 **2.1.1.1 Site Location**

The Units 6 & 7 plant area is part of the larger Turkey Point plant property located approximately 25 miles south of Miami in unincorporated Miami-Dade County, Florida. The approximate 9400-acre Turkey Point plant property includes two gas/oil-fired steam electric generating units, Units 1 & 2, one natural gas combined cycle plant, Unit 5, and four nuclear powered steam electric generating units, Units 3 & 4 and Units 6 & 7 (**Reference 201**). **Figure 2.1-201** shows the Turkey Point site and the surrounding area within 50 miles. **Figure 2.1-202** illustrates the general location of the Turkey Point plant property and localities surrounding the site within 10 miles.

The prominent natural features of the region surrounding the Turkey Point plant property, as shown in **Figures 2.1-201** and **2.1-202** include Biscayne Bay and the Everglades National Park. Biscayne Bay is surrounded by the barrier islands, which eventually become part of the Florida Keys, and is connected to the Atlantic Ocean by many natural and man-made channels. Tributaries to Biscayne Bay in the region surrounding the Turkey Point plant property include several man-made canals (**Reference 206**). The Turkey Point plant property is also located near the eastern edge of the Everglades, a vast area of marshland that ranges from Lake Okeechobee to the southern tip of the Florida peninsula (**Reference 207**). The Turkey Point plant property lies on the Floridian plateau, a partly submerged peninsula of the continental shelf. The peninsula is underlain by approximately 4000 to 15,000 feet of sedimentary rocks consisting of limestone and associated formations (**Reference 201**).

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Miami-Dade County is bounded on the north by Broward County, on the west by Monroe and Collier counties, on the east by Biscayne Bay and the Atlantic Ocean, and on the south by the Florida Bay and the Florida Keys (Monroe County) (Reference 202). The county is located along the southeast tip of the Florida peninsula and covers approximately 2000 square miles of land area with approximately one-third of the area consisting primarily of the Everglades National Park (References 203, 204, and 205). The predominant existing land uses around the Turkey Point plant property are undeveloped and protected areas with Turkey Point Units 1 through 5 and transmission infrastructure occupying the land adjacent to Turkey Point Units 6 & 7 (Reference 201).

Miami-Dade County had a 2006 estimated population of 2,402,208 and includes 35 incorporated areas (municipalities) while the remainder of the county is unincorporated (References 203, 208, and 209). Of the incorporated areas located in Miami-Dade County, the municipalities of Homestead, Islandia, and Florida City are within 10 miles of the Turkey Point plant property. As illustrated in Figures 2.1-201 and 2.1-202, Units 6 & 7 are situated approximately 8 miles east of the municipality of Florida City and 4.5 miles east of the southeastern municipal limits of Homestead and approximately 5.6 miles west of Islandia (References 202 and 222). In the year 2000, the U.S. Census Bureau reported a population of 31,909 for Homestead, 6 for Islandia, and 7843 for Florida City (Reference 209). Communities in the unincorporated area of Miami-Dade County that are within 10 miles of the Turkey Point site include: Naranja, approximately 7.6 miles to the northwest of Units 6 & 7; Princeton, approximately 6.2 miles to the north-northwest of Units 6 & 7; and Goulds, approximately 9.7 miles to the north of Units 6 & 7 (Reference 202).

There are several recreational and park areas located in Miami-Dade County. A few of these recreational areas are located near the Turkey Point plant property, as shown in Figure 2.1-202 and described below:

- The Biscayne National Park consists of 173,000 acres of water, coastal lands, and 42 keys, located to the northeast, east, and southeast of the Turkey Point plant property. The Biscayne National Park headquarters is approximately 2.8 miles north of the site.
- The Biscayne Bay aquatic preserve is a shallow, subtropical lagoon consisting of approximately 69,000 acres of submerged land (Reference 201). The aquatic preserve is in two different areas of Biscayne Bay that are separated by Biscayne National Park (Reference 206). One area of the Biscayne Bay

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aquatic preserve runs along the coastal boundary of the Turkey Point plant property ([References 201](#) and [210](#)).

- The Model Lands Basin consists primarily of fresh and saltwater wetlands that form a contiguous habitat corridor with Everglades National Park, Biscayne National Park, and other designated lands in Miami-Dade County. The Model Lands Basin is fragmented with state, local, and private ownership. With the exception of the South Florida Water Management District Canal L-31E, which is adjacent to the Turkey Point plant, the closest Model Lands Basin properties are approximately 2 miles from Units 6 & 7 ([References 201](#) and [211](#)).
- The Crocodile Lake National Wildlife Refuge is a 6600-acre area located south of Units 6 & 7 that is home to several federally endangered and threatened species. The refuge headquarters is located 16 miles south of the plant property but the area is currently closed to the public with access granted by special permit only ([Reference 212](#)).
- Homestead Bayfront Park, located approximately 1.7 miles north of Units 6 & 7, is a recreational park owned and operated by Miami-Dade County. The park is adjacent to Biscayne National Park and maintains facilities such as a marina, a picnic pavilion, and a fishing area. The park also offers access to the Biscayne Trail, which traverses Miami-Dade County and is used for pedestrian and biking activities.
- The FPL Everglades Mitigation Bank located west and south of the Turkey Point plant is a wetlands mitigation project returning more than 13,000 acres of wetlands to their historical conditions ([Reference 201](#)).

Units 6 & 7 are near a military installation, a racecourse, and a public marina, as shown on [Figure 2.1-202](#). Homestead Air Reserve Base is approximately 4.76 miles northwest of Units 6 & 7. The 482nd Fighter Wing maintains and operates the base. Five tenant organizations use the services and infrastructure at the base. Homestead Miami Speedway is a 600-acre racecourse located approximately 4.7 miles northwest of Units 6 & 7. The Homestead Bayfront Marina, approximately 2.8 miles north of Units 6 & 7, is a public marina in Homestead Bayfront Park ([References 201](#) and [202](#)).

Several highways traverse Miami-Dade County. Interstate 95, U.S. Highway 1, and the Florida Turnpike (State Road 821) are the major transportation routes for north-south traffic flow in the county. The major routes for east-west movement are U.S. Route 41, a two-lane roadway that crosses the peninsula through the

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middle of the county into Naples in Collier County, and I-75, which crosses the peninsula to Naples via Miami-Dade, Broward, and into Collier Counties. Main access to the Turkey Point site is Palm Drive (SW 344th Street), which runs in an east-west direction. Palm Drive provides a direct connection with U.S. Highway 1 in Florida City and thereby a direct connection via U.S. Highway 1 to the Florida Turnpike ([References 201](#) and [202](#)).

2.1.1.2 Site Description

Besides the electric power generating facilities, no other commercial, industrial, institutional, or residential structures are located in the Turkey Point plant property. Units 6 & 7 is to the south of Units 1 through 5 as delineated on the site area maps ([Figures 2.1-203](#) and [2.1-204](#)). The center point of the Unit 6 containment building is approximately 215 feet west and 3625 feet south of the center point of the Unit 4 containment building. The Unit 7 footprint is separate from, but adjacent to, the Unit 6 footprint. The center point of Unit 7 is approximately 850 feet west of the center point of Unit 6. The combined power block footprints of Units 6 & 7, which include the transformer area and the containment, turbine, annex, auxiliary and diesel generator buildings, encompass an area of approximately 30 acres. The switchyard comprises an additional 15 acres, the cooling tower reservoir area is approximately 37 acres, and the area contained within the plant area is approximately 218 acres ([Figures 2.1-203](#) and [2.1-205](#)).

The Turkey Point plant primarily resides in the Arsenicker Keys, Florida, and the Card Sound, Florida 7.5-minute United States Geological Survey (USGS) topographic quadrangles ([Reference 213](#)). The coordinates of the center of the reactor containment building for Units 6 & 7 are given below in the geodetic latitude/longitude and the Universal Transverse Mercator (UTM) coordinate systems:

Unit	Latitude/Longitude (NAD 27) (Degrees)	Latitude/Longitude (NAD 83) (Degrees)	UTM, Zone 17N (84W to 78W) (NAD 27) (Meters)	UTM, Zone 17N (84W to 78W) (NAD 83) (Meters)
6	N 25° 25' 25.7"	N 25° 25' 27.1"	North/South 2,811,883.63	North/South 2,812,086.79
	W 80° 19' 55.9"	W 80° 19' 55.1"	East/West 567,158.19	East/West 567,179.31
7	N 25° 25' 25.7"	N 25° 25' 27.1"	North/South 2,811,883.62	North/South 2,812,086.79
	W 80° 20' 05.1"	W 80° 20' 04.3"	East/West 566,899.19	East/West 566,920.31

2.1.2 EXCLUSION AREA AUTHORITY AND CONTROL

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As required by 10 CFR 100.21(a), an exclusion area boundary (EAB) and a low population zone (LPZ) have been identified to meet the requirements established in 10 CFR 100.3. The EAB for Units 6 & 7 primarily lies within the EAB for Units 3 & 4 with the exception of the eastern and southern portions. The combined EAB provides a minimum distance of 1427 feet from the source boundary for Units 6 & 7 (Figure 2.1-204). The source boundary encompasses all potential release points for both Units 6 & 7. The LPZ for Units 3 & 4 and Units 6 & 7 is a circle with a radius of 5 miles with its center located at the midpoint of Units 3 & 4. The EAB and LPZ are shown in Figures 2.1-203 and 2.1-202, respectively.

2.1.2.1 Authority

FPL owns most of the property within the Turkey Point plant property boundary, including the entire exclusion area, subject to certain encumbrances on portions of the property within the exclusion area, specifically, certain canal, drainage, reclamation, oil, gas and mineral rights reservations held by the Trustees of the Internal Improvement Fund of the State of Florida and a canal reservation held by Miami-Dade County. Also, a small parcel of submerged land in the southeast and south-southeast portions of the exclusion area is located in the Biscayne Bay waterway. With the exception of the described submerged land, the site boundary entirely encompasses the designated exclusion area for Units 6 & 7. Because of the location of the submerged land, this portion of the exclusion area cannot be reasonably accessed except through FPL property.

Thus, except for the matters noted, FPL has the authority to determine activities within the exclusion area, including the exclusion and removal of personnel and property, and FPL has authority over the exclusion area in the event of an emergency to afford protection of public health and safety. FPL has begun negotiations with the State of Florida and Miami-Dade County in anticipation of its filing of a site certification application pursuant to Florida's Power Plant Siting Act. Through the site certification process, FPL expects to receive full authority and control over the exclusion area, consistent with the requirements in 10 CFR Part 100. Upon completion of the land transactions with the State and the County, FPL will be able to determine all activities in the entirety of the exclusion area, including the exclusion of personnel and property. In no event, shall FPL initiate construction, as defined under 10 CFR 50.10, until it has sufficient authority to determine all activities within the exclusion area.

2.1.2.2 Control of Activities Unrelated to Plant Operation

As described in **Subsection 2.1.2.1**, upon completion of the land transactions with the State and the County, FPL will be able to determine all activities in the entirety of the exclusion area, including the exclusion of personnel and property. There will be no areas within the exclusion area in which activities unrelated to plant operation would be permitted.

2.1.2.3 Arrangements for Traffic Control

No federal, state, or county roads or railways traverse the Units 6 & 7 exclusion area. As stated in **Subsection 2.1.2.1**, a small portion of the exclusion area is located in the Biscayne Bay waterway. In accordance with 10 CFR 100.3, FPL has made appropriate and effective arrangements with the United States Coast Guard to control traffic on this waterway in the event of an emergency to protect the public health and safety.

2.1.2.4 Abandonment or Relocation of Roads

No public roads are relocated or abandoned.

2.1.3 POPULATION DISTRIBUTION

The population surrounding the Turkey Point site, to a 50-mile radius, was estimated based on 2000 United States Census Bureau (USCB) decennial census data. The population was estimated on a sector basis in a series of 10 concentric rings. The concentric rings were divided into 16 directional sectors, each sector consisting of 22.5 degrees. The rings were spaced at 0 to 1 mile, 1 to 2 miles, 2 to 3 miles, 3 to 4 miles, 4 to 5 miles, 5 to 10 miles, 10 to 20 miles, 20 to 30 miles, 30 to 40 miles, and 40 to 50 miles with its center located at the midpoint of Units 6 & 7. The populations for years 2020 through 2090 have been projected by calculating a growth rate using state population projections (by county) as the base. The projected population for the expected first year of plant operation (2022 for Unit 6 and 2023 for Unit 7) is conservatively selected as that for the year 2030.

2.1.3.1 Resident Population Within 10 Miles

Figure 2.1-206 shows the general location of the municipalities and other features within 10 miles of the Turkey Point site. According to the 2010 census, Homestead, which had a population of 60,512 in 2010, is the largest community within 10 miles of the site. Cutler Bay (2010 population of 40,286), Florida City (11,245), Islandia (18), Leisure City (22,655), Naranja (8,303), and Princeton

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(22,038), all in Miami-Dade County, also lie within 10 miles of the site. The community of Goulds (10,103) is 10 miles north-northwest of the site (Reference 214).

The resident population distribution within 10 miles of the site was computed by overlaying the 2010 census block (the smallest unit of census data) on the grid shown on Figure 2.1-206, and adding the populations of the census block points in each sector/radius. Population projections to year 2030 were obtained from the Office of Economic and Demographic Research and were used to calculate an exponential growth rate for each county within 50 miles of the Turkey Point site (Reference 215). The growth rate for each county was then used to project future populations (in each sector and radius, taking into account the percent of each sector in a particular county).

The population distributions (including transient population) and related information were tabulated for radial distances in each of the 16 sectors. Figure 2.1-207 through Figure 2.1-215 show the total (resident and transient) population for the year 2010 and the projected populations, by decade, through the year 2090. The current population within 10 miles is assumed to be that shown for the year 2010. For the 0–1 mile radius, the north sector is the only direction containing a population (the Turkey Point employees). For clarity, zero populations for the other 15 sectors within the 0-1 mile radius are not shown on the figures. The 10-mile radius populations for the years 2010 through 2090 (by decade) are as follows:

Year	10-Mile Radius Population
2010	92,594
2020	208,501
2030	225,825
2040	244,692
2050	265,234
2060	287,599
2070	311,946
2080	338,444
2090	367,285

2.1.3.2 Resident Population Between 10 and 50 Miles

The 50-mile radius centered on Units 6 & 7 includes all or parts of four counties in Florida (Figure 2.1-216). Estimates of the year 2010 resident population between 10 and 50 miles from Turkey Point were computed using the same methodology used to develop the 10-mile population distribution.

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The population grid from 10 to 50 miles is shown on [Figure 2.1-216](#). The 10- to 50-mile population distributions for the years 2010 through 2090 (by decade) are shown on [Figure 2.1-217](#) through [Figure 2.1-225](#). The 50-mile radius populations (including the 0- to 10-mile populations) for each year are:

Year	50-Mile Radius Population
2010	3,464,756
2020	3,728,167
2030	4,012,989
2040	4,321,018
2050	4,654,194
2060	5,014,635
2070	5,404,626
2080	5,826,651
2090	6,283,428

2.1.3.3 Transient Population

2.1.3.3.1 Transient Population Within 10 Miles

Variations in population because of recreational and industrial land uses have been accounted for by keying recreational facility capacities and employment numbers to the sector/radius areas shown on [Figure 2.1-206](#). For conservatism, peak seasonal and daily populations have been accounted for in the base (year 2010) population and projected, by decade, through the year 2090 along with resident population. The transient population segment includes people in the workforce, hotels/motels, recreational areas, and migrant populations.

Employees within 10 miles fall into two categories: (1) those that live and work within 10 miles of Units 6 & 7, and (2) those that live outside of the 10-mile radius and commute to jobs in the emergency planning zone (EPZ). Those in the first category are already counted as permanent residents. To minimize double counting, only those employees that commute into the EPZ were included as transients ([Reference 216](#)).

Employee transient information is based on *Journey to Work* employment data from the USCB. Employees at Units 3 & 4 were included in the transient population for the 0- to 1-mile radius (1467 employees). It is assumed that there is no employment in the Monroe County portion of the EPZ. Based on employment data in the evacuation time estimate, there are 20,472 employees commuting into the EPZ ([Reference 216](#)).

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Recreational opportunities were also evaluated to determine seasonal and daily variations in population and population distribution. Recreational opportunities in the area include Biscayne National Park, Black Point Park, Black Point Marina, Camp Owaissa Bauer, Coral Castle Museum, Harris Field, Homestead Sports Complex, Keys Gate Golf Club, Larry and Penny Thompson Memorial Park, South Miami-Dade Cultural Arts Center, Prime Outlets in Florida City, Southland Mall, and Homestead Bayfront Marina/Herbert Hoover Marina and Park (Reference 216). These recreational areas were evaluated as follows:

- Biscayne National Park is adjacent to the Turkey Point site, bordering it to the south, east, and west. On a daily basis, there are approximately 400 people at the facility, assumed to be transients. Campsites at the park are only accessible by boat (Reference 216).
- Black Point Park and Marina is located approximately 7 miles north of the Turkey Point site. The park contains a pavilion that can shelter 50-100 people. Black Point Park can have up to 8000 visitors during special events. An average of 50 percent of these visitors are EPZ residents. Therefore, 4000 transients are at the park during peak times. Black Point Marina has 425 regular parking spaces, 18 handicap parking spaces, and 2 strollers-only parking for the 178 in-water slips and 10 floating docks at the facility. There are 203 parking spots for cars with trailers and 10 handicap parking spots for cars with trailers, therefore 2613 transients are at the park during peak times (Reference 216).
- Camp Owaissa Bauer is a children's camp approximately 10 to 11 miles northwest of the site. Because the camp would be evacuated in the event of an emergency, the transient population was included in this analysis. The camp can accommodate 150 overnight campers in dormitory-style cabins, with separate staff quarters (Reference 216).
- The Coral Castle Museum is approximately 8 miles northwest of the Turkey Point site. Patrons of the museum are evenly split between local residents and tourists. There are 100 visitors per day during the peak season, 50 of whom are transients (Reference 216).
- Harris Field is 8 miles west-northwest of the Turkey Point site. Based on the number of parking spaces at the football stadium, there could be 591 people at the facility (Reference 216).

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- Homestead Sports Complex is 3 miles west of the Turkey Point site. The peak times this facility is used are summer weekends. There are an estimated 1000 people at the facility during peak times. It is assumed all of these visitors are transients ([Reference 216](#)).
- Keys Gate Golf Club is 7 miles west-northwest of the Turkey Point site. The golf club entertains 200 people during the peak season, 50 percent of whom are transients ([Reference 216](#)).
- Larry & Penny Thompson Memorial Park is approximately 11 miles north-northwest of the Turkey Point site, but would also be evacuated in the event of an emergency at the plant because of its proximity to the EPZ. Therefore, the transient population attributed to this recreational facility has been included in the current and projected population distributions. The park is adjacent to the Miami Metro zoo and has 270 acres to offer visitors. The campground has 240 separate campsites for recreational vehicles. The campground is assumed to be fully occupied with non-EPZ residents (i.e., transient). Based on the capacity of 240 campsites (four people per site), 960 campers could be present at the campground. There are also 200 additional parking spaces available for daytrippers. Assuming two people per vehicle, an additional 400 daytrippers visit the facility, for a total of 1360 transients at Larry and Penny Thompson Memorial Park ([Reference 216](#)).
- South Miami-Dade Cultural Arts Center is located 43 miles north of the Turkey Point site. The theater can accommodate 200 vehicles and 1100 people. There is one festival per month that attracts 2500 people. Half of the visitors are local residents. Therefore a maximum of 1250 transients and 313 transient vehicles are at the facility at any given time, assuming 4 people per vehicle ([Reference 216](#)).
- The Prime Outlets at Florida City include 40 discount stores and a small food court. It is located approximately 8 miles west of the Turkey Point site. There are 3500 vehicles and two tour buses at the facility during peak hours. The outlets are a more significant attraction to non-EPZ residents because they are located along the main route to the Florida Keys. Thirty-five percent of the parking lot capacity is assumed to be non-EPZ residents. Assuming three people per vehicle plus 20 people per bus, a peak number of 3715 transients could be present at the Prime Outlets of Florida ([Reference 216](#)).
- The Southland Mall (formerly Cutler Ridge Mall) includes several large department stores and more than 100 specialty stores. It is approximately 10

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miles north-northwest of the Turkey Point site, just off of the Florida Turnpike. Parking lot capacity of the mall is approximately 5100 parking spaces. The mall is not a significant attraction for non-EPZ residents because there are many other large malls located north of the EPZ. Therefore, 25 percent of the mall's visitors are assumed to be non-EPZ residents. During a peak day, the mall can accommodate 1275 transient vehicles resulting in 3825 transients (three people per vehicle) (Reference 216).

- The Homestead Bayfront Park/Herbert Hoover Marina is 2.8 miles from Turkey Point site. The peak visitation on weekends averages approximately 2000 people at the marina based on 500 parked vehicles, assumed to be transients (Reference 216).

Lodging facilities within 10 miles also account for seasonal and daily variations in population and population distribution. People staying in hotels and motels in the area have also been accounted for in this transient study. Capacities and the average number of people staying at the facilities during peak occupancy were determined (Reference 216).

Accounting for major employers, overnight accommodations, major recreation areas, and marinas within 10 miles, a total of 44,388 transients, could be present within 10 miles and 53,547 within the EPZ (Reference 216).

The 10-mile transient population was added to the resident distribution and projected for future years (Figure 2.1-207 through Figure 2.1-215). The baseline transient population distribution for the 10-mile radius is:

Radius	Direction	Number of Transients
0–1	N	1,467
2–3	N	2,400
5–10	N	7,508
5–10	SSE	7,363
5–10	W	8,493
5–10	WSW	50
5–10	WNW	11,943
5–10	NW	1,327
5–10	NNW	3,837
10-EPZ	N	1,503
10-EPZ	NW	150
10-EPZ	NNW	7,506
Total		53,547

2.1.3.3.2 Transient Population Between 10 and 50 Miles

Variations in population because of recreational and industrial land uses within 10 to 50 miles are generally described in this section. The transient population from 10 to 50 miles from the Turkey Point site was not quantified because of the large error associated with keying these populations to sectors. For emergency planning, the 10-mile radius is the most critical area in which to accurately quantify the population distribution for evacuation purposes and accident analysis; therefore, the 10- to 50-mile radius transient population has been characterized but not quantified or keyed to sectors.

Four south Florida counties (Broward, Collier, Miami-Dade, and Monroe) and two major metropolitan areas (Miami and Ft. Lauderdale) lie within 50 miles of the Turkey Point site, as shown on [Figure 2.1-201](#). South Florida is a popular vacation destination for both U.S. and foreign tourists. Broward County, which includes greater Fort Lauderdale and its beaches, has seen a steady increase in the number of visitors in recent years, from 8.5 million in fiscal year 2003 to 10.1 million in fiscal year 2010 ([Reference 217](#)). More than 12.6 million people visited Miami-Dade County in 2010, the highest number ever recorded ([Reference 218](#)). Domestic visitors made up 52 percent of those who traveled to the Miami area, while international visitors made up 48 percent. Collier County, which includes the “Paradise Coast” of Naples and Marco Island, saw more than 1.38 million tourists in 2010 ([Reference 219](#)). However, as shown on [Figure 2.1-216](#), only a small inland portion of Collier County, which is part of the Big Cypress National Preserve, lies within 50 miles of the site. Monroe County, the southernmost county in the continental United States, is comprised of the Florida Keys and portions of Everglades National Park and Big Cypress National Preserve. Approximately 70 percent of visitors to the Florida Keys arrive by car. Smaller numbers arrive by air and by cruise ship. In 2010, approximately 2.6 million people came by car to the Keys, 850,300 visitors came by ship, and 277,966 by air ([Reference 220](#)).

Seasonal variations in population include agricultural workers that move through the area during planting and harvesting periods. These workers may also make up a portion of the transient population in the 10- to 50-mile radius. The USCB does not keep counts of seasonal agriculture workers. However, the U.S. Department of Agriculture does keep count of the number of farms, by county, that employ migrant labor. Three of the four counties that lie within 50 miles of the Turkey Point site contain farms that employ migrant labor: Broward (24 farms), Collier (38 farms), and Miami-Dade (234 farms). There are no farms in Monroe County that employ migrant labor ([Reference 221](#)).

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There is much uncertainty associated with quantifying the transient population to 50 miles. Because of this uncertainty, the transient population was not keyed to sectors or projected for future years.

2.1.3.4 Low Population Zone

The LPZ consists of the area falling within 5 miles of the center of Units 3 & 4. No facilities or institutions requiring special consideration for emergency planning purposes such as schools, nursing homes, hospitals, prisons, or major employers (other than Turkey Point) are known to exist in the LPZ. Two recreational facilities are in the LPZ. The Dante Fascell Visitor Center at Biscayne National Park is approximately 3 miles north of Units 6 & 7, and hosts approximately 400 visitors a day. The Homestead Bayfront Park/Herbert Hoover Marina, which can accommodate 2000 visitors, is approximately 2 miles north of the Turkey Point site. **Figure 2.1-226** shows topographical features of the LPZ.

The resident and transient population distributions in the LPZ for each decade from 2010 through 2090 are shown on **Figure 2.1-207** through **Figure 2.1-215**. The total populations in the LPZ for years 2010 through 2090 are:

Year	LPZ Population
2010	3881
2020	4221
2030	4591
2040	4993
2050	5431
2060	5905
2070	6424
2080	6984
2090	7598

2.1.3.5 Population Center

The closest population center (population of greater than 25,000) is the city of Homestead. Units 6 & 7 are approximately 4.5 miles east of the southeastern municipal limits of Homestead. Homestead's population in 2010 was 60,512 (**Reference 214**). The distance to the boundary of the population center is 1.6 times the radius of the 5-mile LPZ. This distance meets the requirement that the population center distance be at least one and one-third times the distance from the reactor to the outer boundary of the LPZ (10 CFR 100.21(b)).

Population groupings within 10 miles are located from approximately 7 to 10 miles from the Turkey Point site, ranging from the west to north sectors

(Figure 2.1-206). The overall population density for the 10-mile radius is 1165 people per square mile for the year 2010 and is projected to increase to 2221 by the year 2090. The west-northwest sector from 5 to 10 miles, the location of the city of Homestead, contains the largest number of residents within 10 miles.

The largest population groupings within 50 miles are located north of the site in the Miami metropolitan area.

2.1.3.6 Population Density

Given the reactor startup dates of 2022 for Unit 6 and 2023 for Unit 7, and an operational period of 60 years, operations could extend until 2083. Figure 2.1-227 shows the cumulative population (including transients) in 2030 (more than 5 years after initial site approval). On the same figure, spanning the same radial distances, a population curve shows the required population to achieve a hypothetical density of 500 people per square mile as required by RG 4.7, Position C.4. To determine the cumulative population for the hypothetical density of 500 people per square mile, the density was multiplied by the land area (area within the circle characterized as land) at various radii as well as the circular area. Due to the number of Turkey Point employees at the 1 mile radius, the 2030 population is greater than the 500-people-per-square-mile density criterion specified in RGs 1.206 and 4.7, using both land area and circular area. Using land area to determine the population from a hypothetical density of 500 people-per-square-mile, the projected 2030 population at the 10 and 20 mile radii exceed this criterion. Using circular area, the projected 2030 population at the 10 and 20 mile radii exceed the population calculated using a hypothetical density of 500 people-per-square-mile. As such, in accordance with RG 4.7, the analysis of alternative sites should pay particular attention to alternative sites having lower population density with consideration given to other factors such as safety, environmental, or economic considerations which may result in the site with the higher population density being found acceptable.

An analysis of alternative sites for the Turkey Point site for the construction and operation of two nuclear power reactors was performed as required by 10 CFR 51.45(b)(3). This evaluation process was also consistent with the special case noted in NUREG-1555, Section 9.3(III)(8), and considered the advantages already present at existing nuclear facilities within the region of interest. Initially, following a detailed evaluation process, potential sites were identified for consideration. These sites were then evaluated based on a range of performance criteria and weight factors derived using methodology consistent with the modified Delphi process specified in the Electric Power Research Institute, Inc.'s

document, *Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application*. During these initial screening phases, specific consideration was given to the avoidance of high population areas, and a prominent weight factor for the population criterion was used during the screening of potential alternative sites. After three successive stages of qualitative and quantitative evaluation, the top five candidate sites were identified. A comparison of the environmental impacts from construction and operation for the proposed site and each of the top alternative sites indicated that environmental impacts would, in general, be higher than or similar to those at the Turkey Point site. Therefore, based on these analyses, FPL concluded that no alternative site is environmentally preferable to the proposed Turkey Point site. When identifying Turkey Point as the preferred alternative, criteria such as safety, environmental, and economic factors, including population density, were taken into account along with the advantages the Turkey Point site has due to the existing nuclear facilities.

STD DEP 1.1-1

2.1.4 COMBINED LICENSE INFORMATION FOR GEOGRAPHY AND
DEMOGRAPHY

PTN COL 2.1-1

This COL item is addressed in **Section 2.1** and **Subsections 1.1.1** and **1.2.2**.

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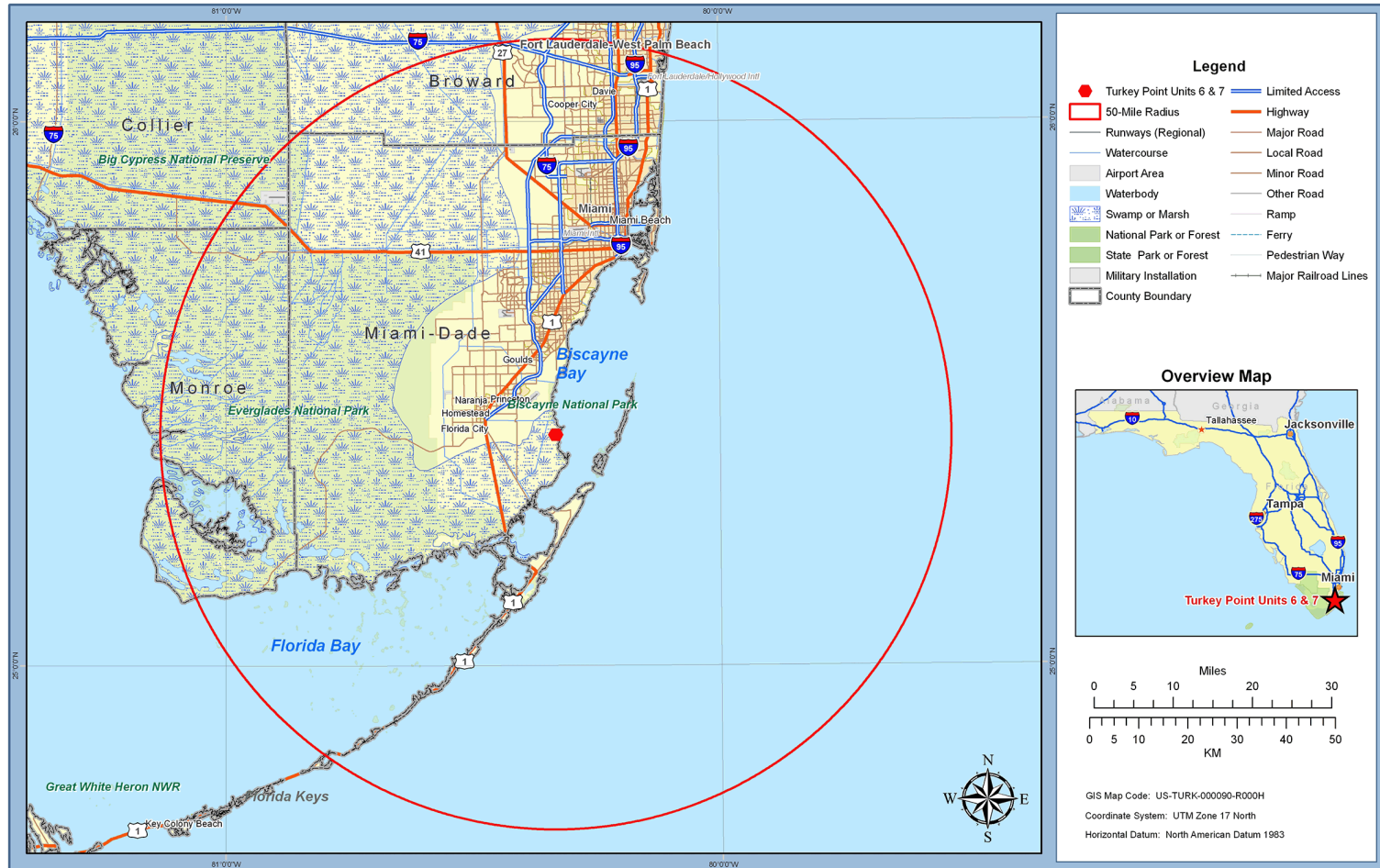
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PTN COL 2.1-1

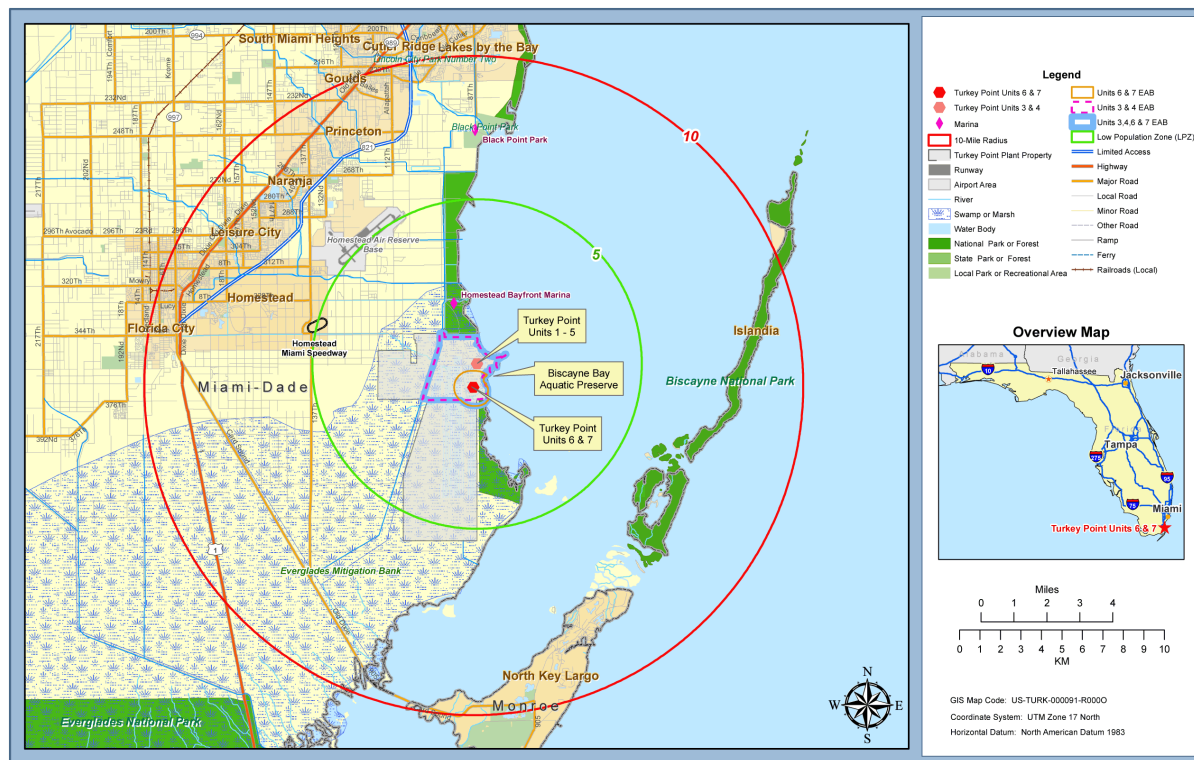
Figure 2.1-201 Turkey Point Surrounding Area (50-Mile Radius)



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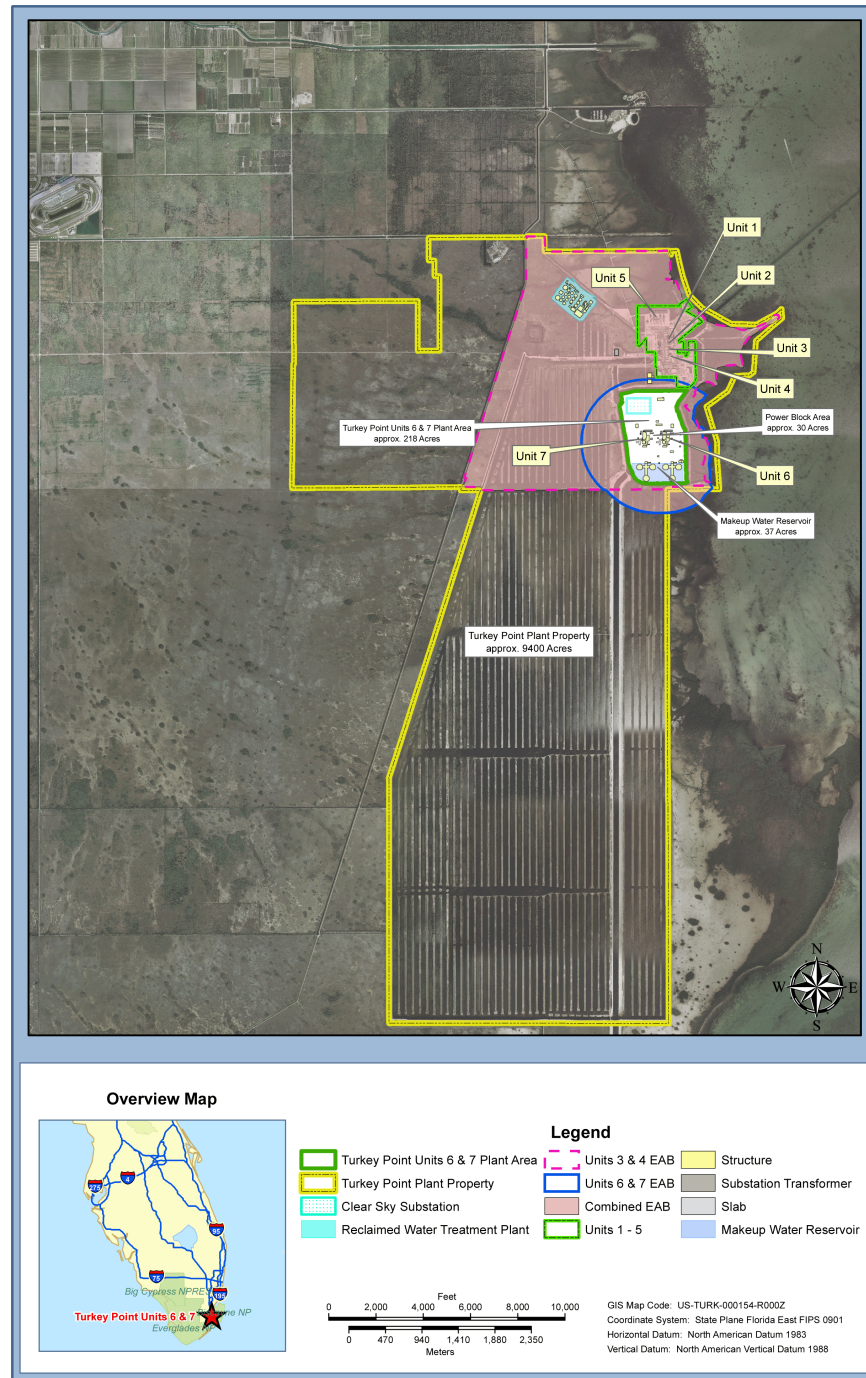
Figure 2.1-202 Turkey Point Surrounding Area (10-Mile Radius)



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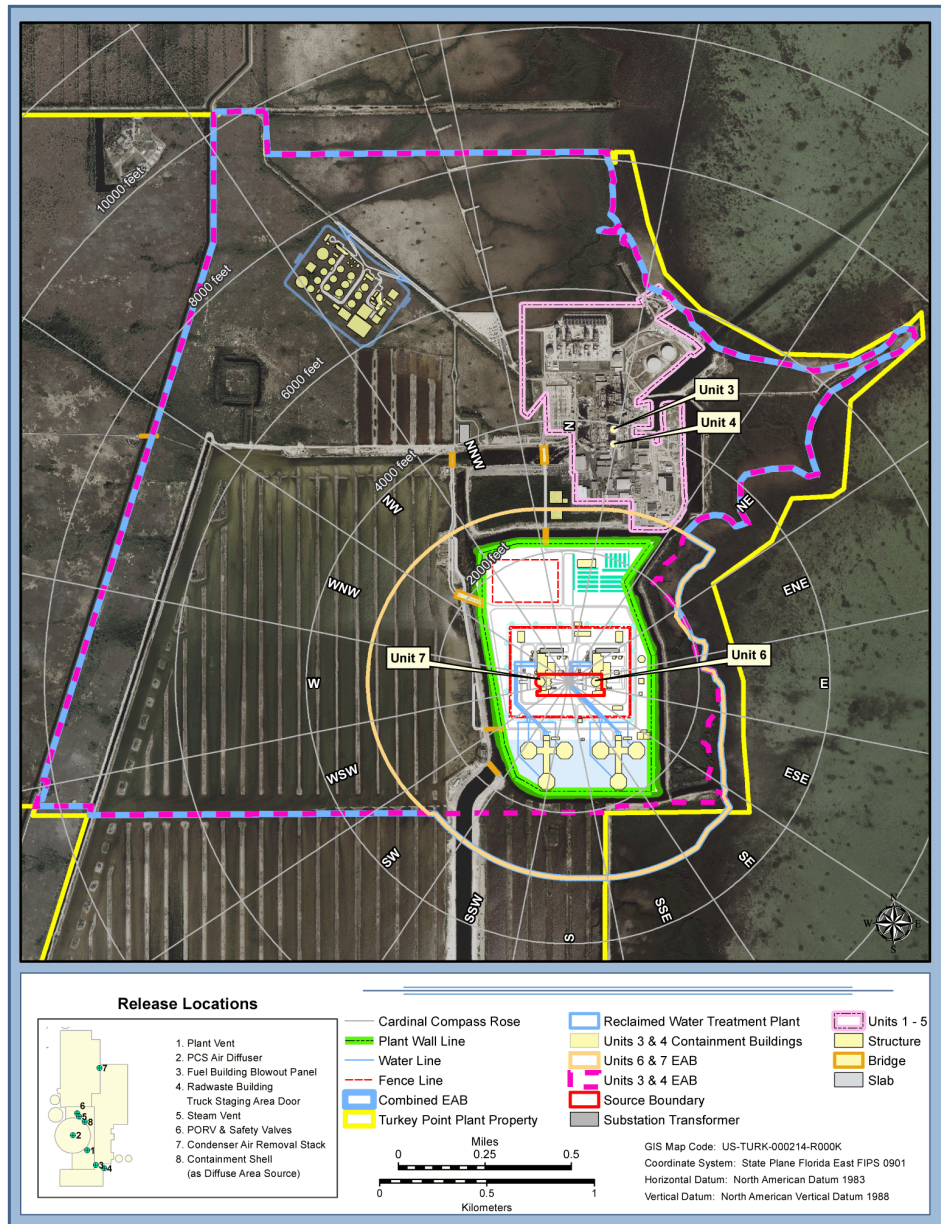
Figure 2.1-203 Turkey Point Site Area Map



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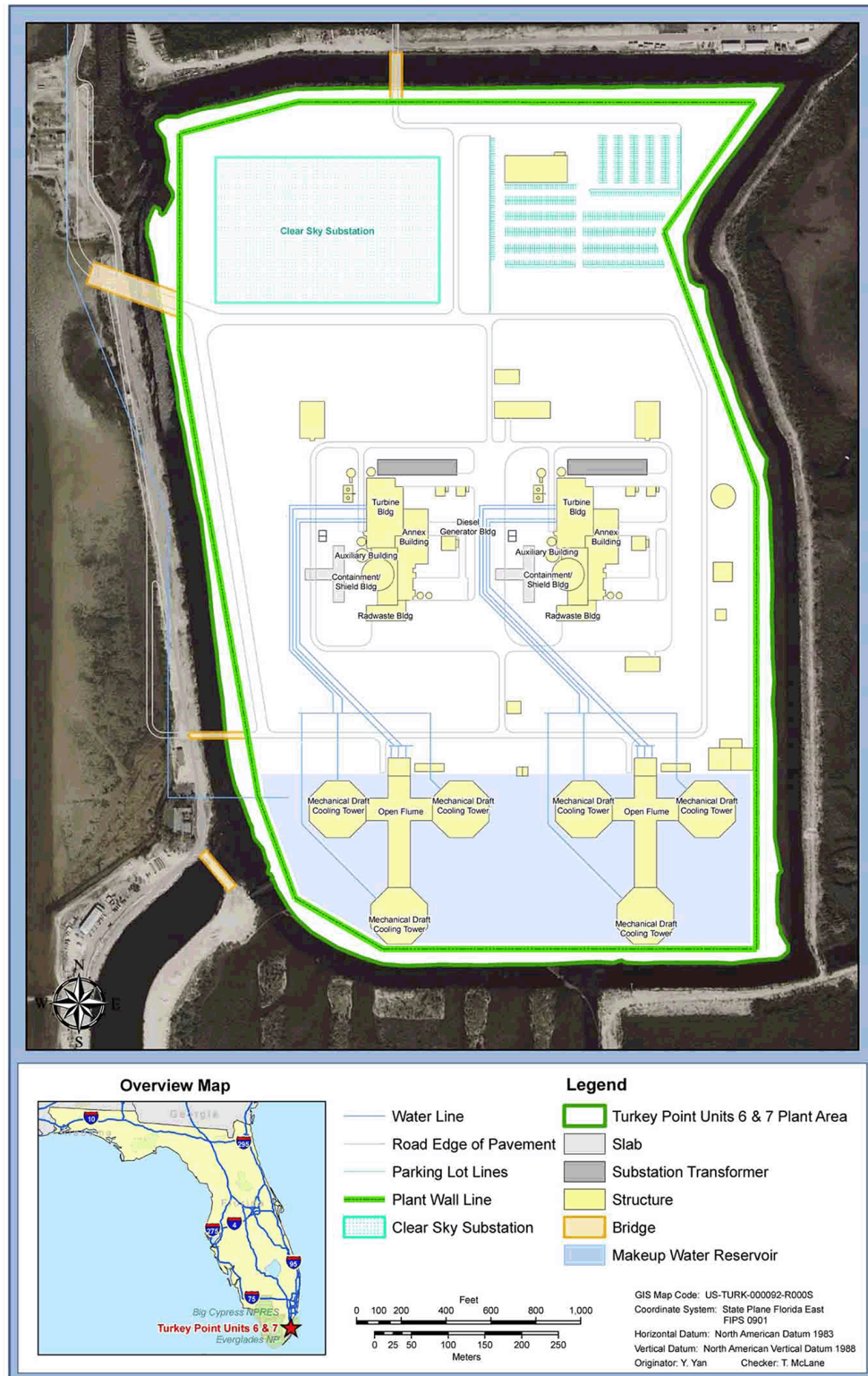
Figure 2.1-204 Turkey Point Enlarged Site Area Map



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Figure 2.1-205 Principal Plant Structures within the Site Area



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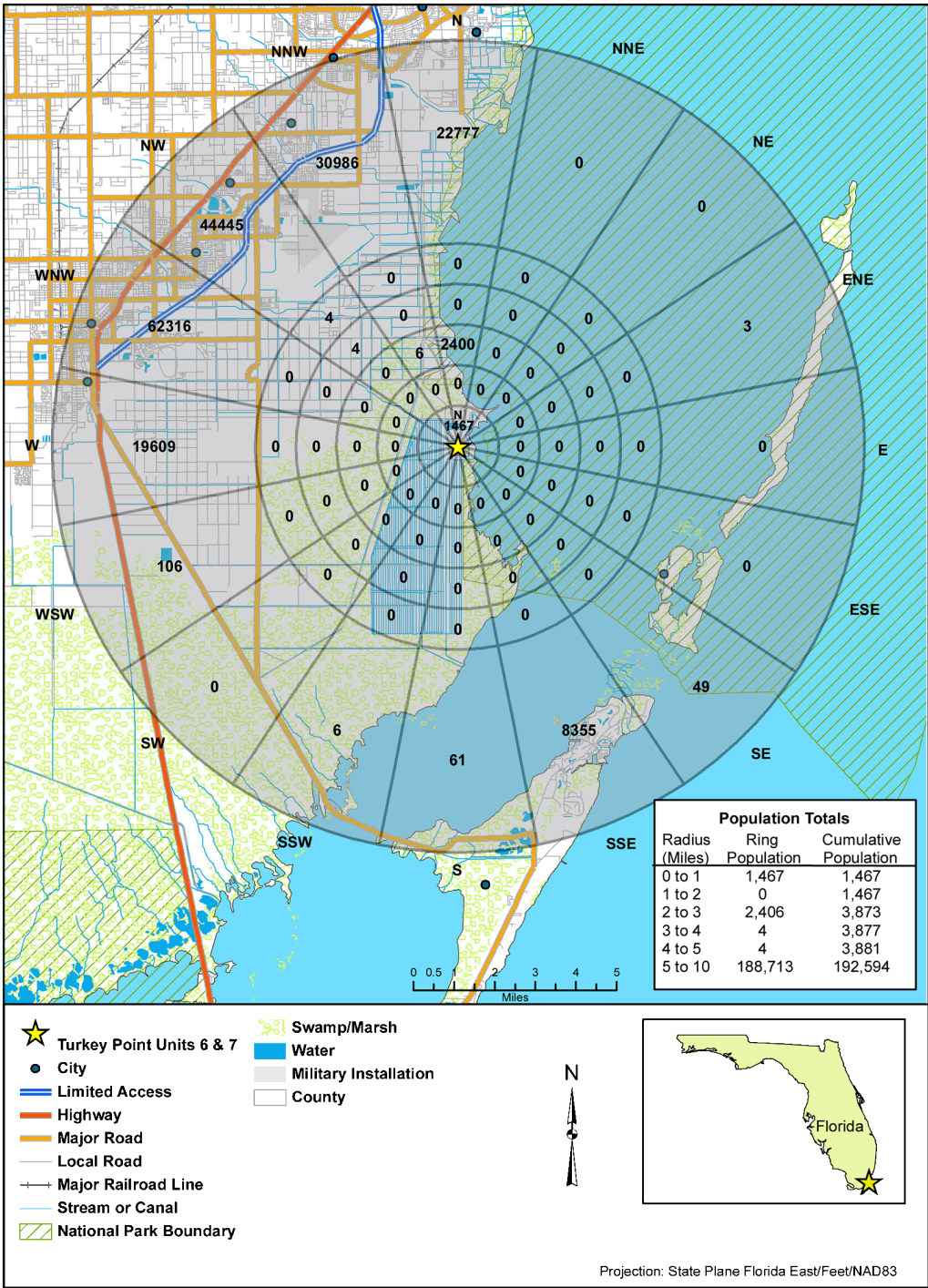
Figure 2.1-206 10-Mile Vicinity with Direction Sectors



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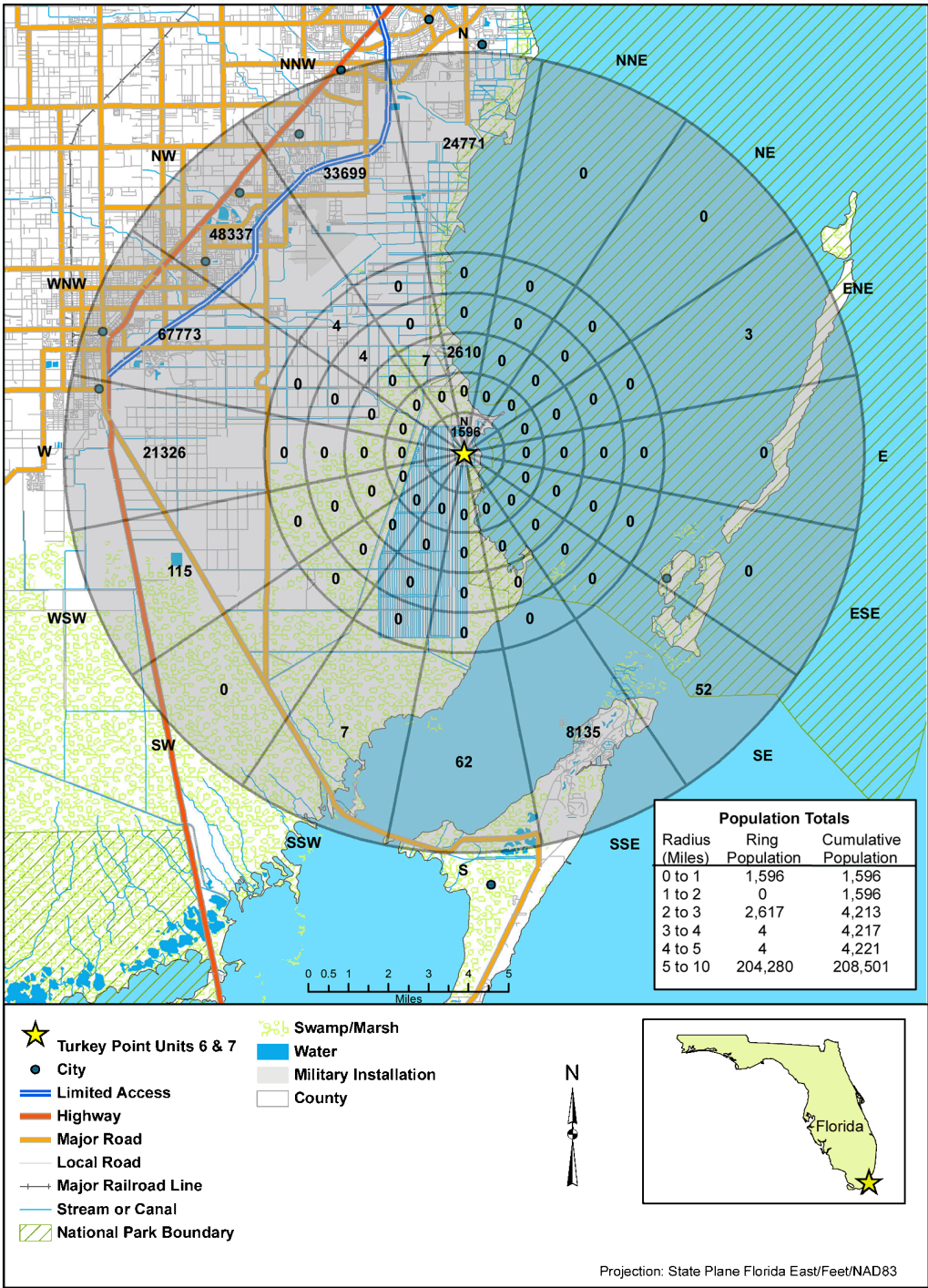
Figure 2.1-207 10-Mile 2010 Resident and Transient Population Distribution



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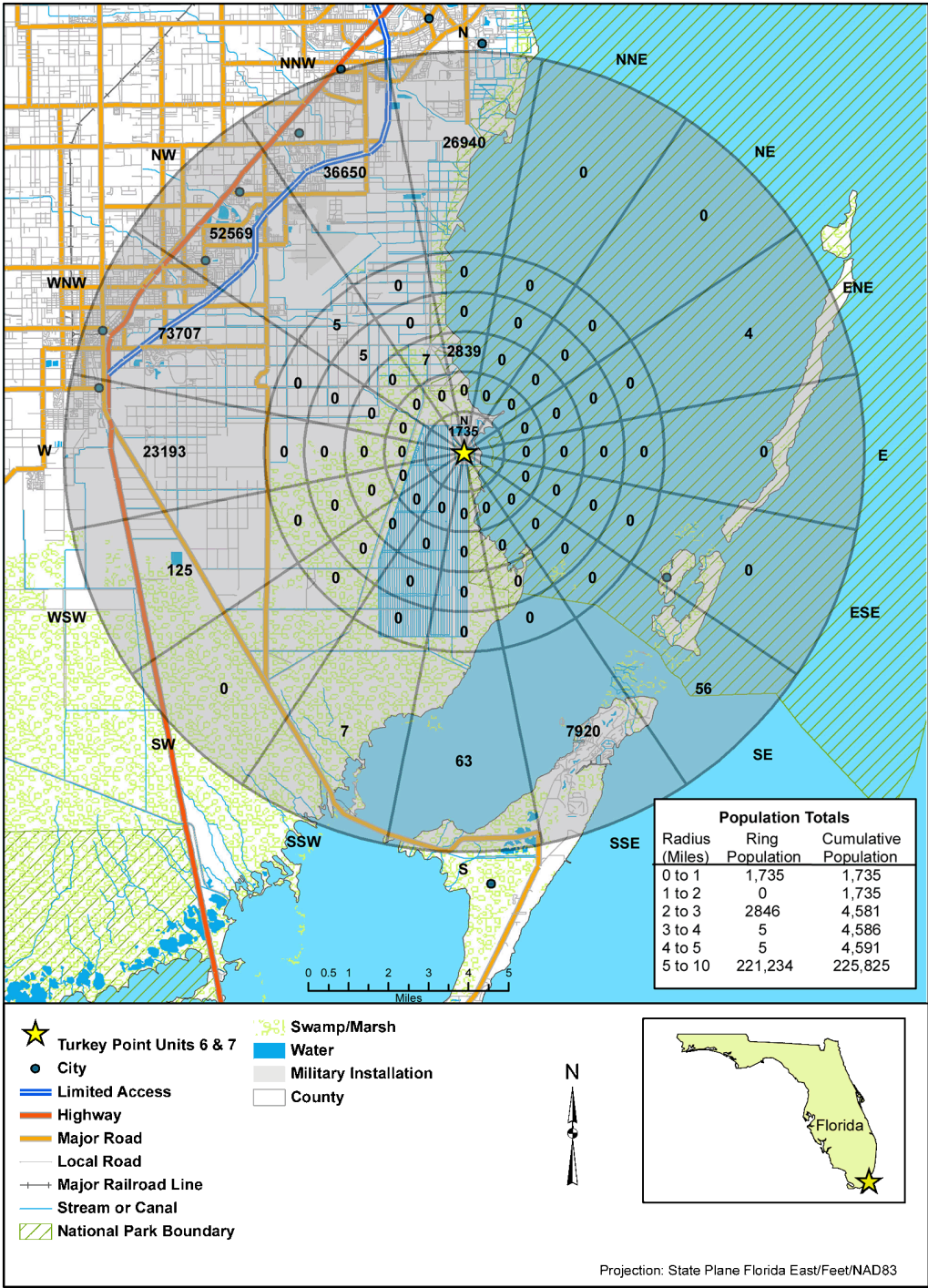
Figure 2.1-208 10-Mile 2020 Resident and Transient Population Distribution



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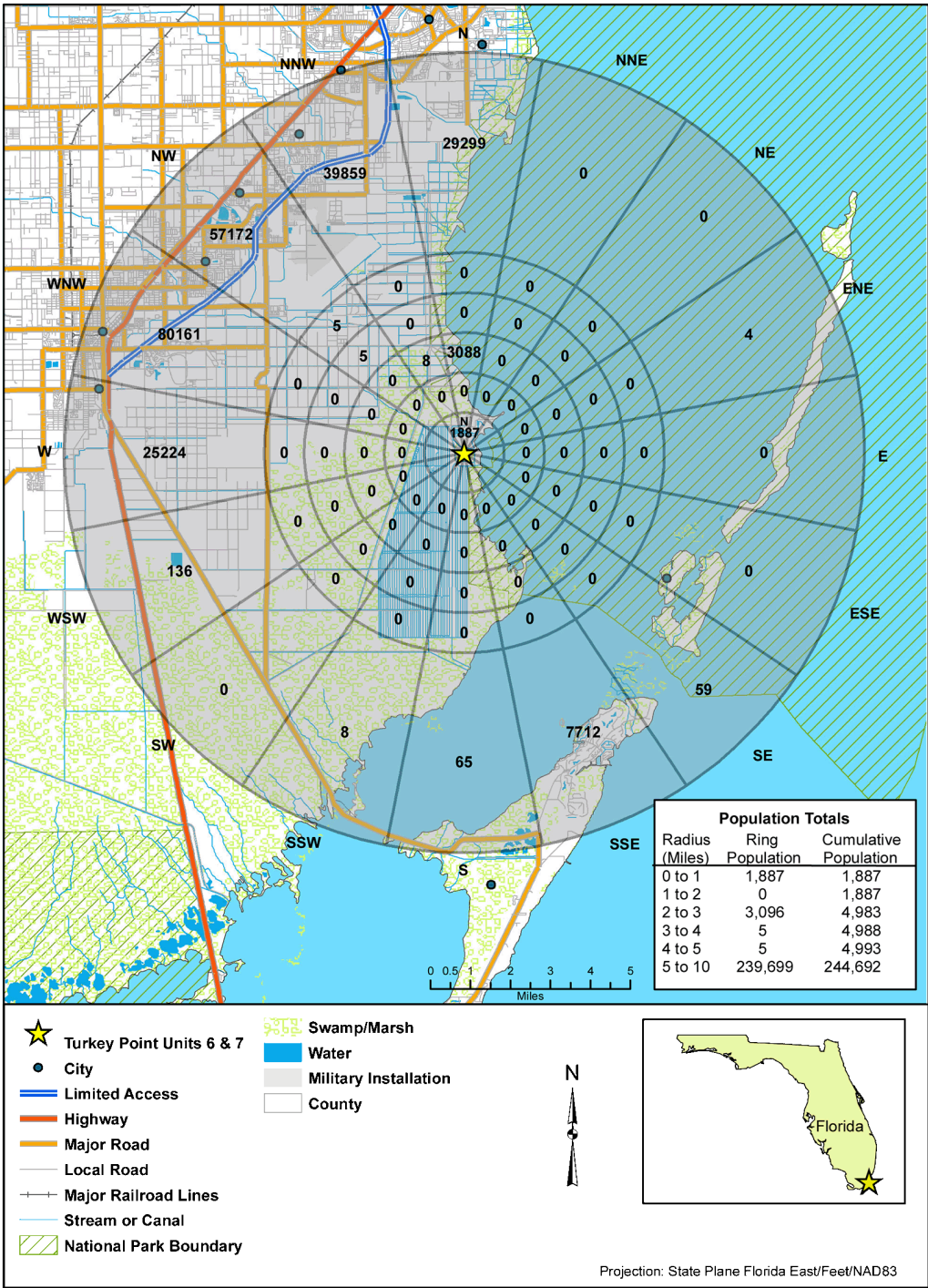
Figure 2.1-209 10-Mile 2030 Resident and Transient Population Distribution



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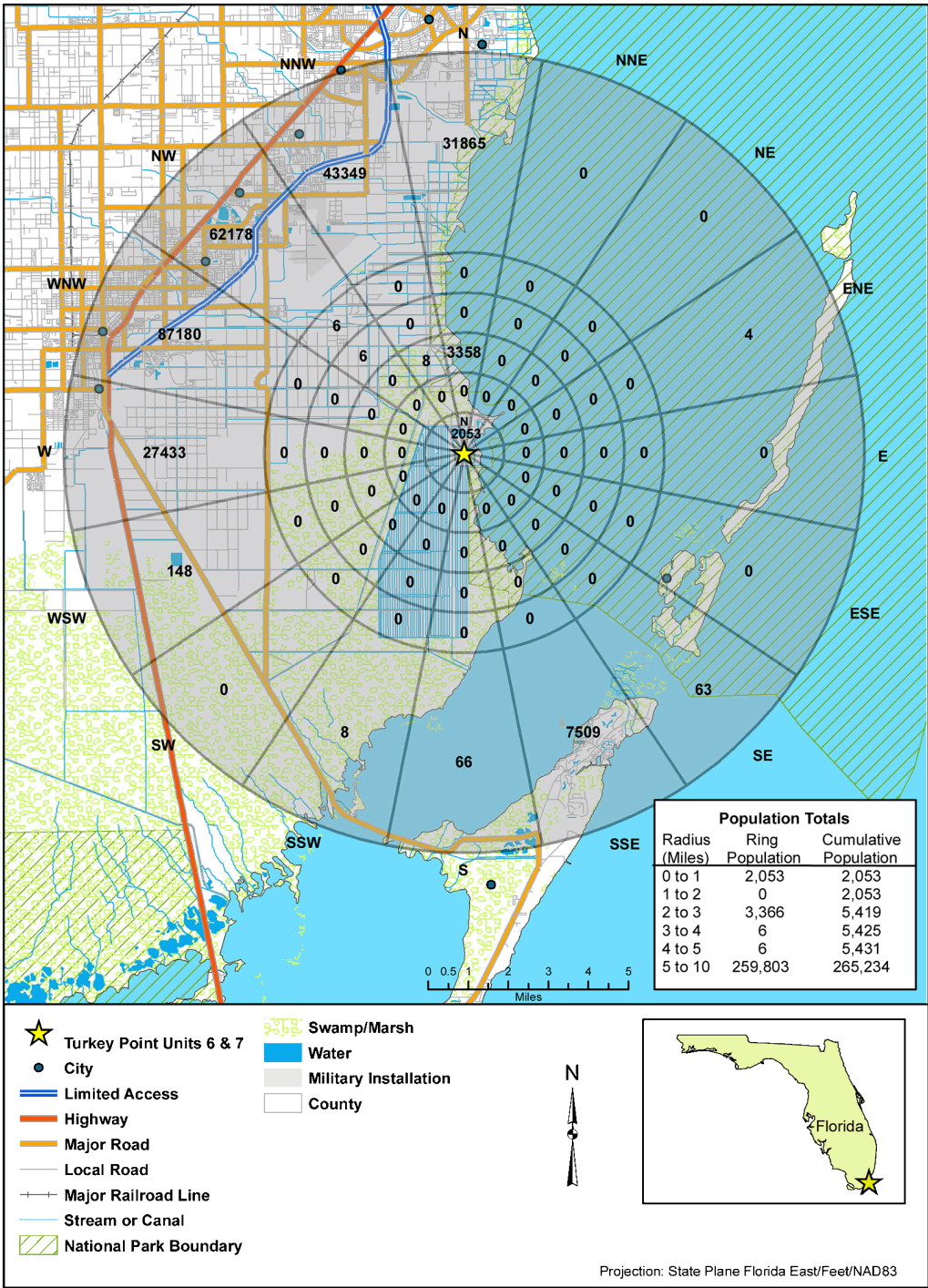
Figure 2.1-210 10-Mile 2040 Resident and Transient Population Distribution



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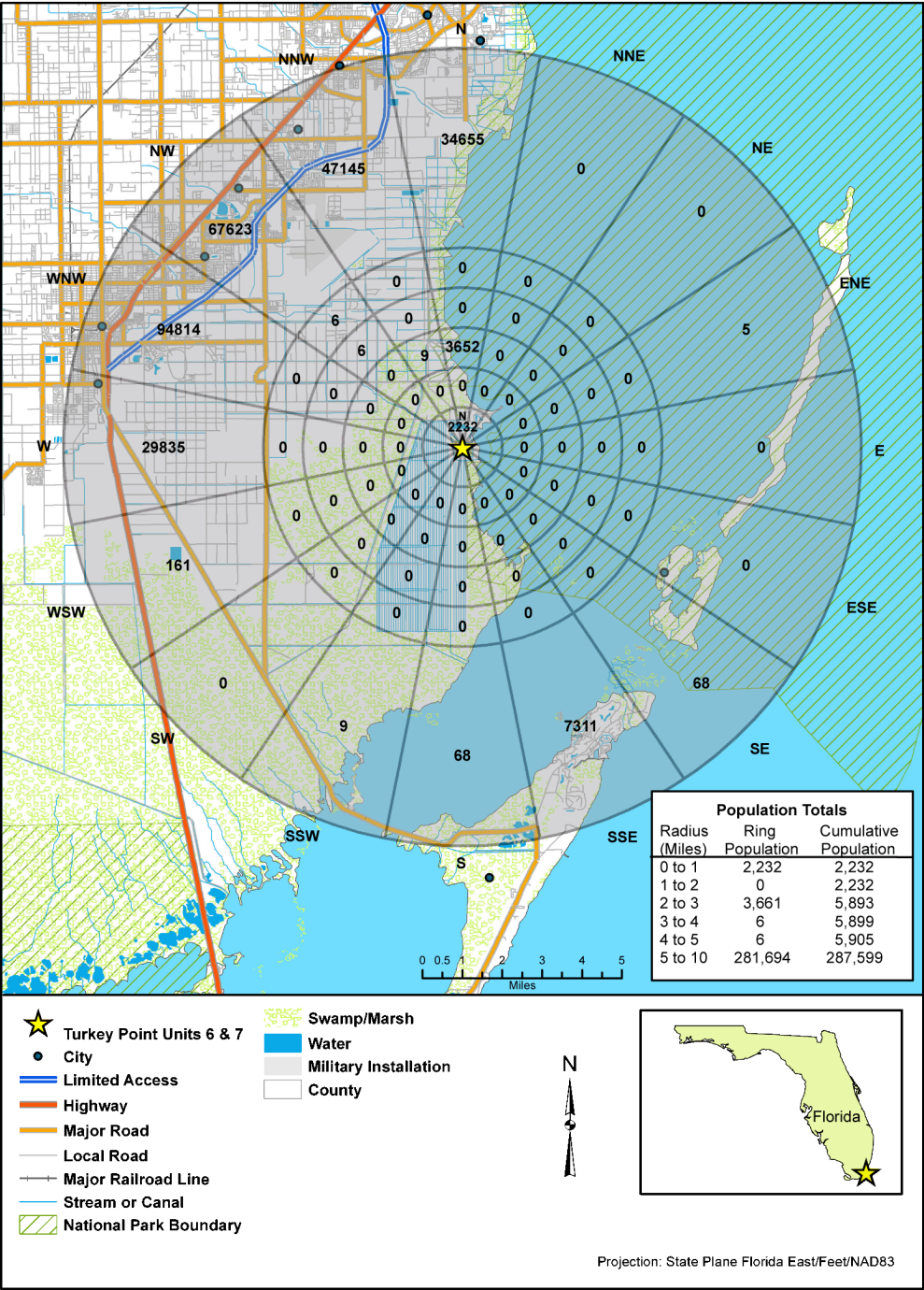
Figure 2.1-211 10-Mile 2050 Resident and Transient Population Distribution



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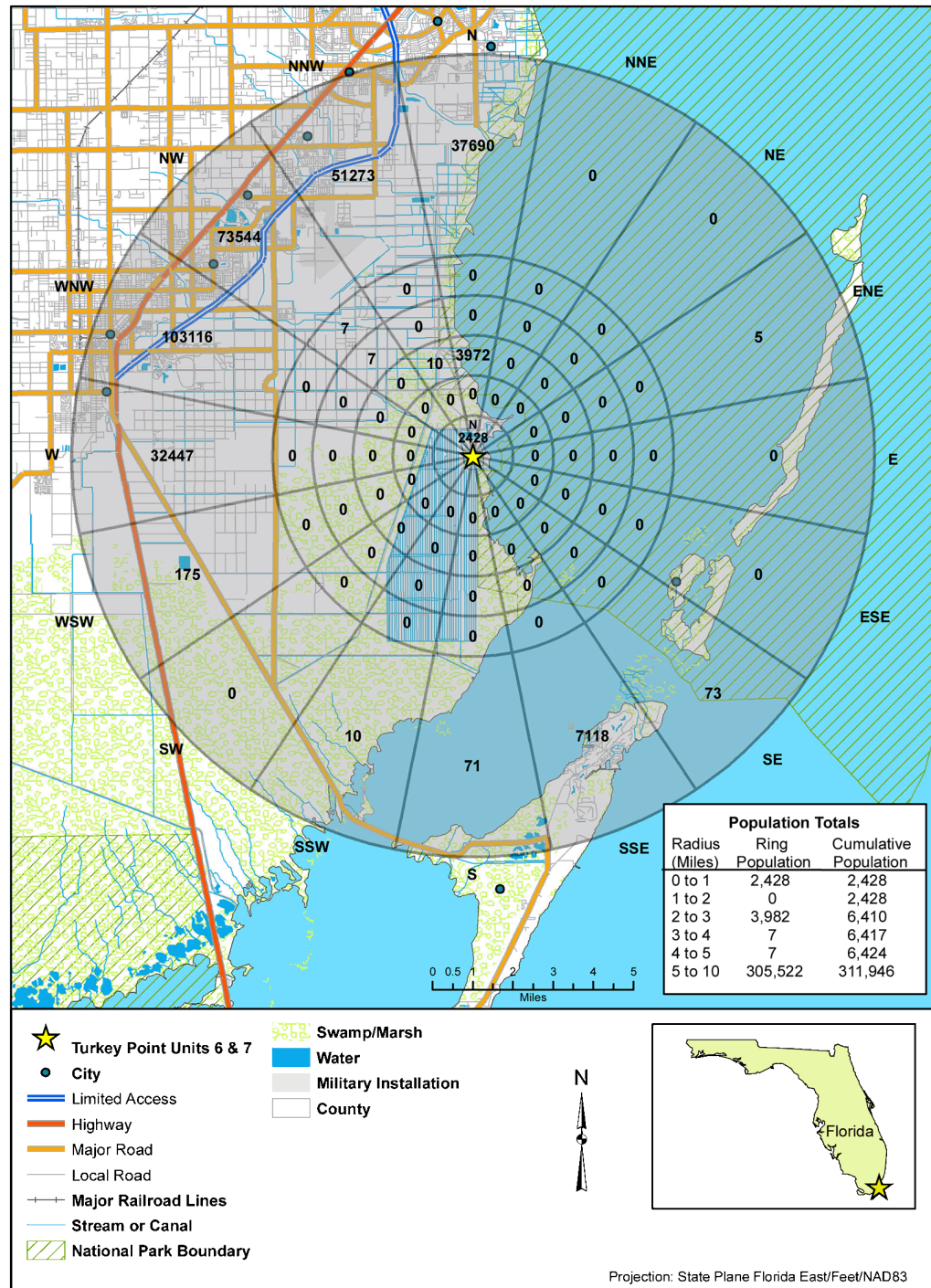
Figure 2.1-212 10-Mile 2060 Resident and Transient Population Distribution



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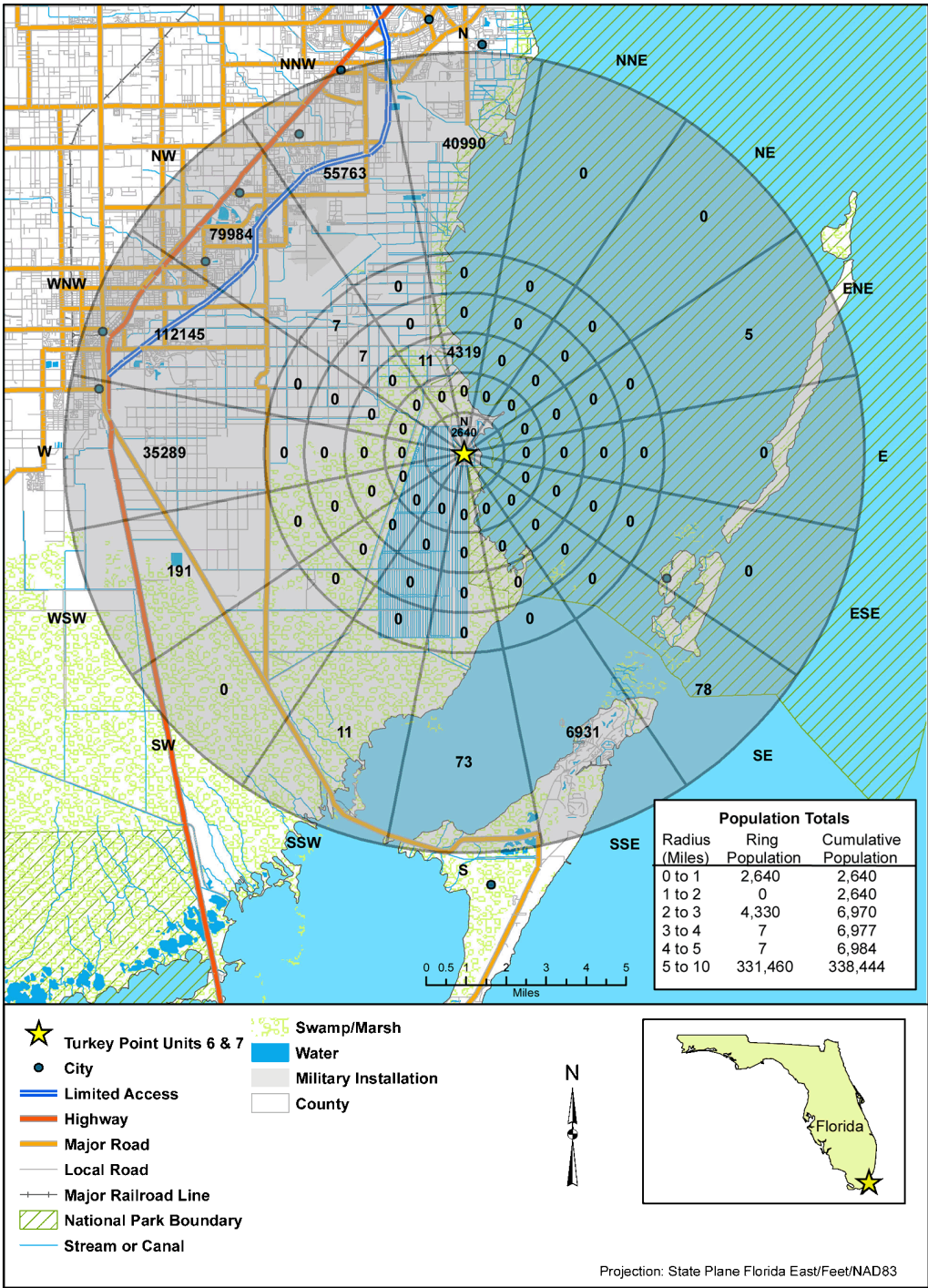
Figure 2.1-213 10-Mile 2070 Resident and Transient Population Distribution



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PTN COL 2.1-1

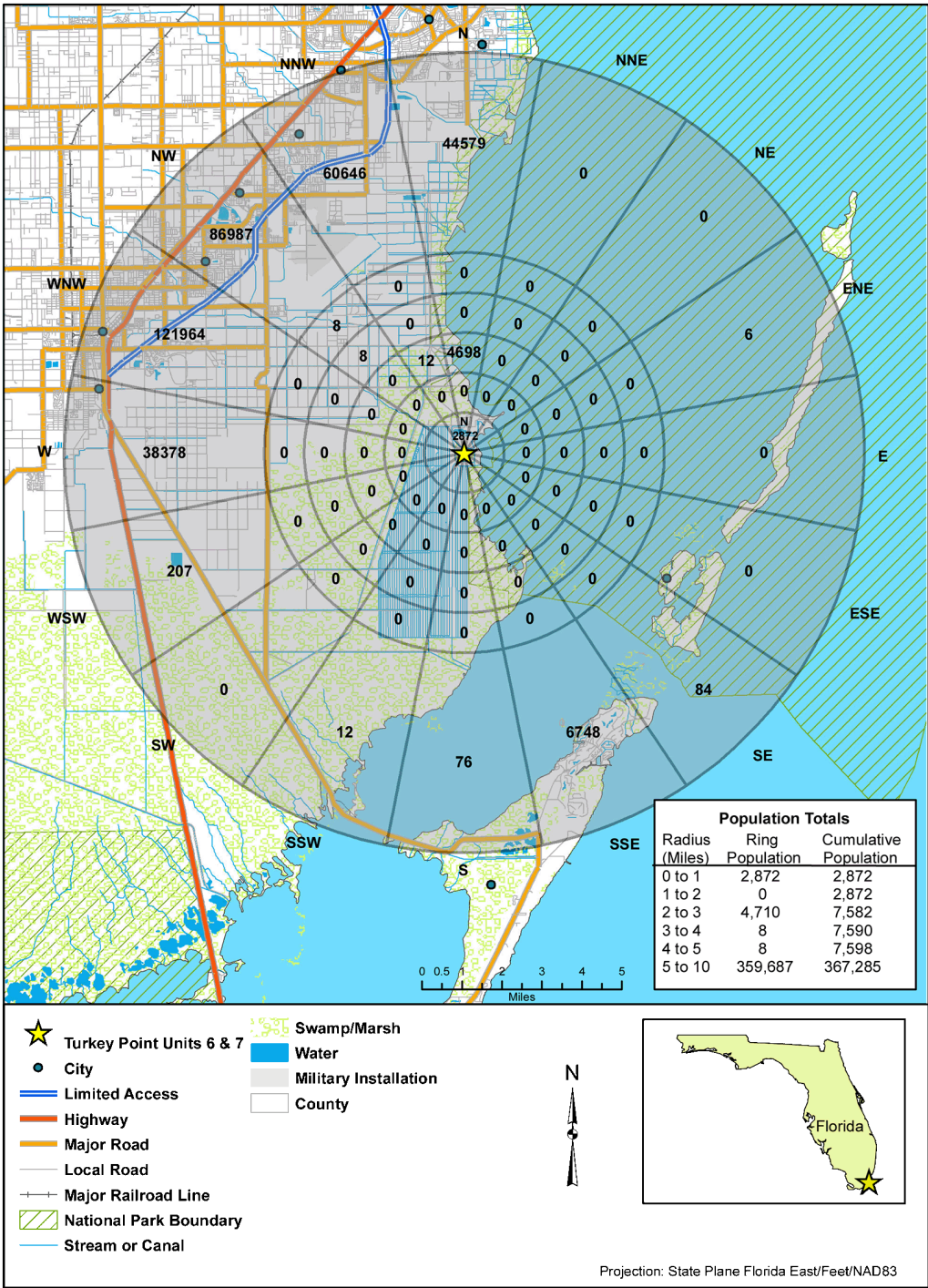
Figure 2.1-214 10-Mile 2080 Resident and Transient Population Distribution



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Figure 2.1-215 10-Mile 2090 Resident and Transient Population Distribution



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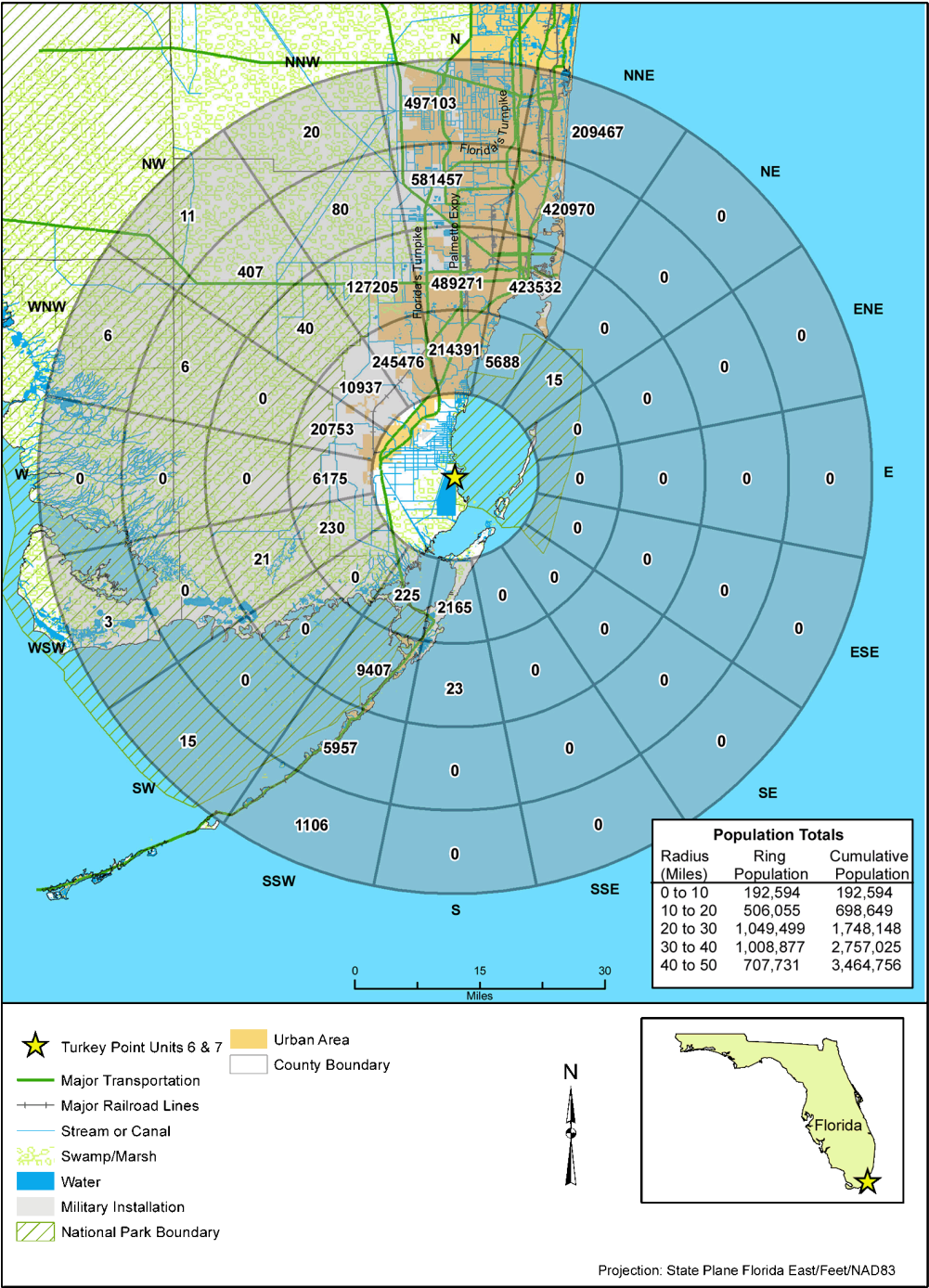
Figure 2.1-216 50-Mile Region with Direction Sectors



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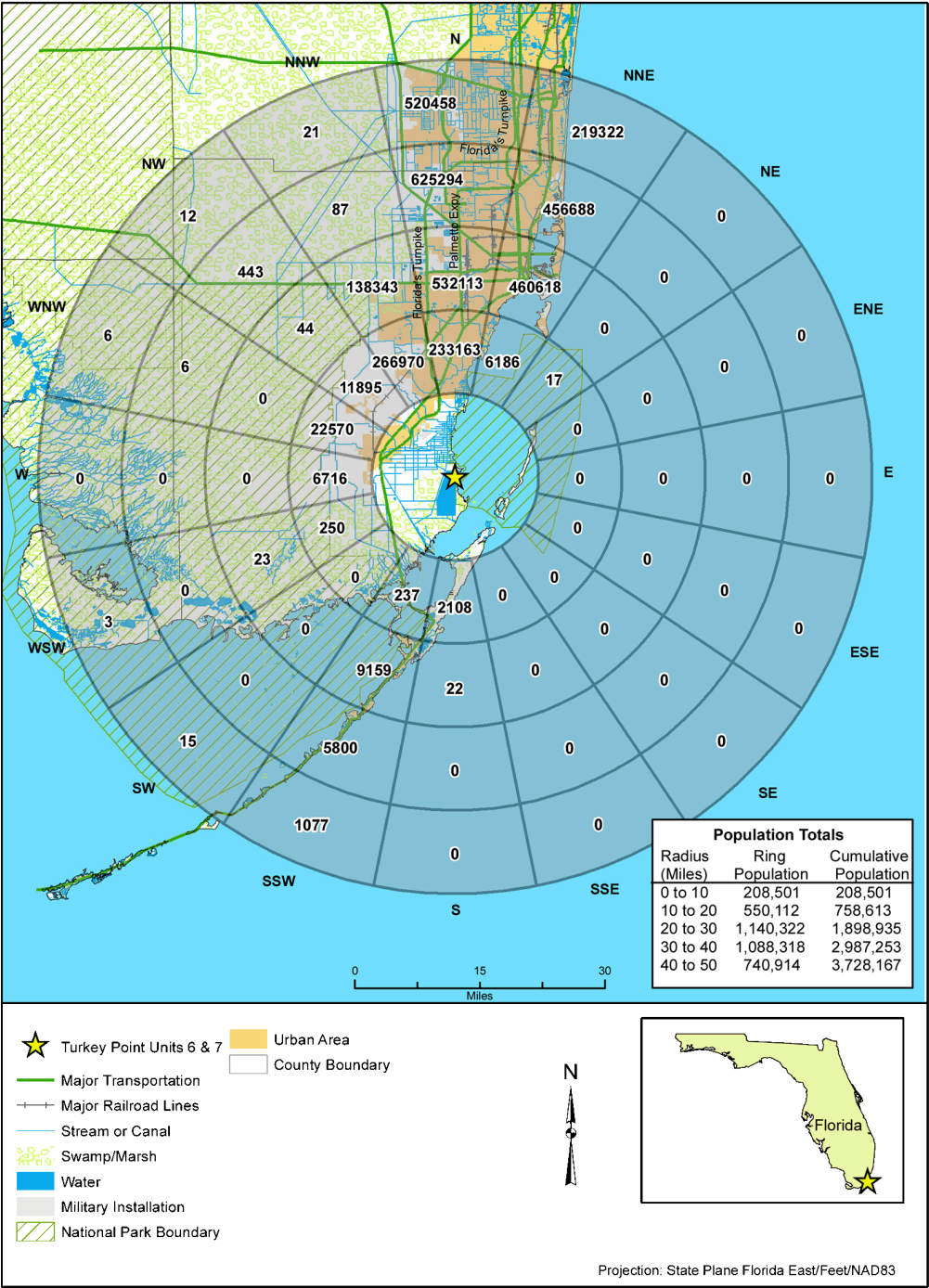
Figure 2.1-217 50-Mile 2010 Resident Population Distribution



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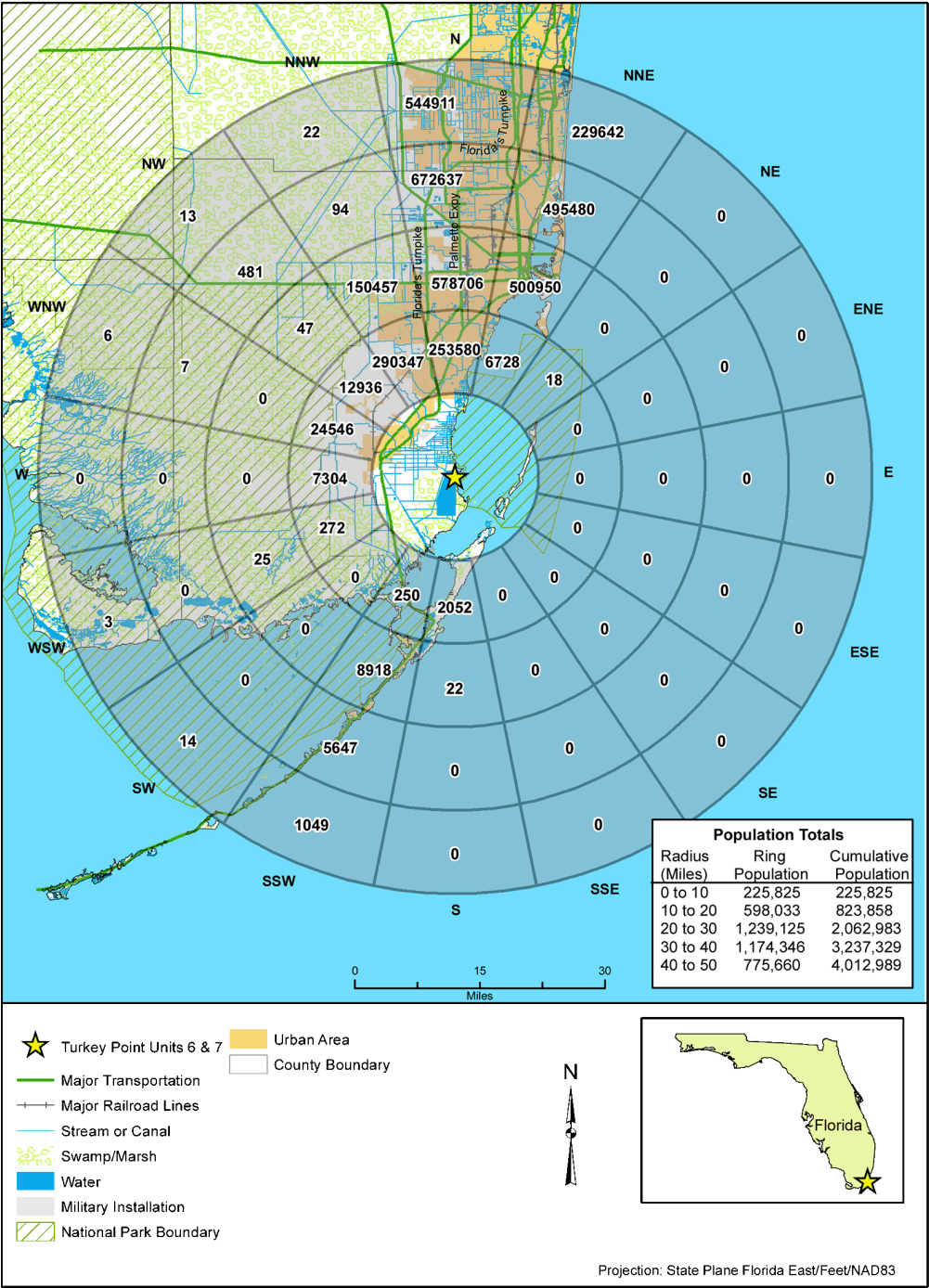
Figure 2.1-218 50-Mile 2020 Resident Population Distribution



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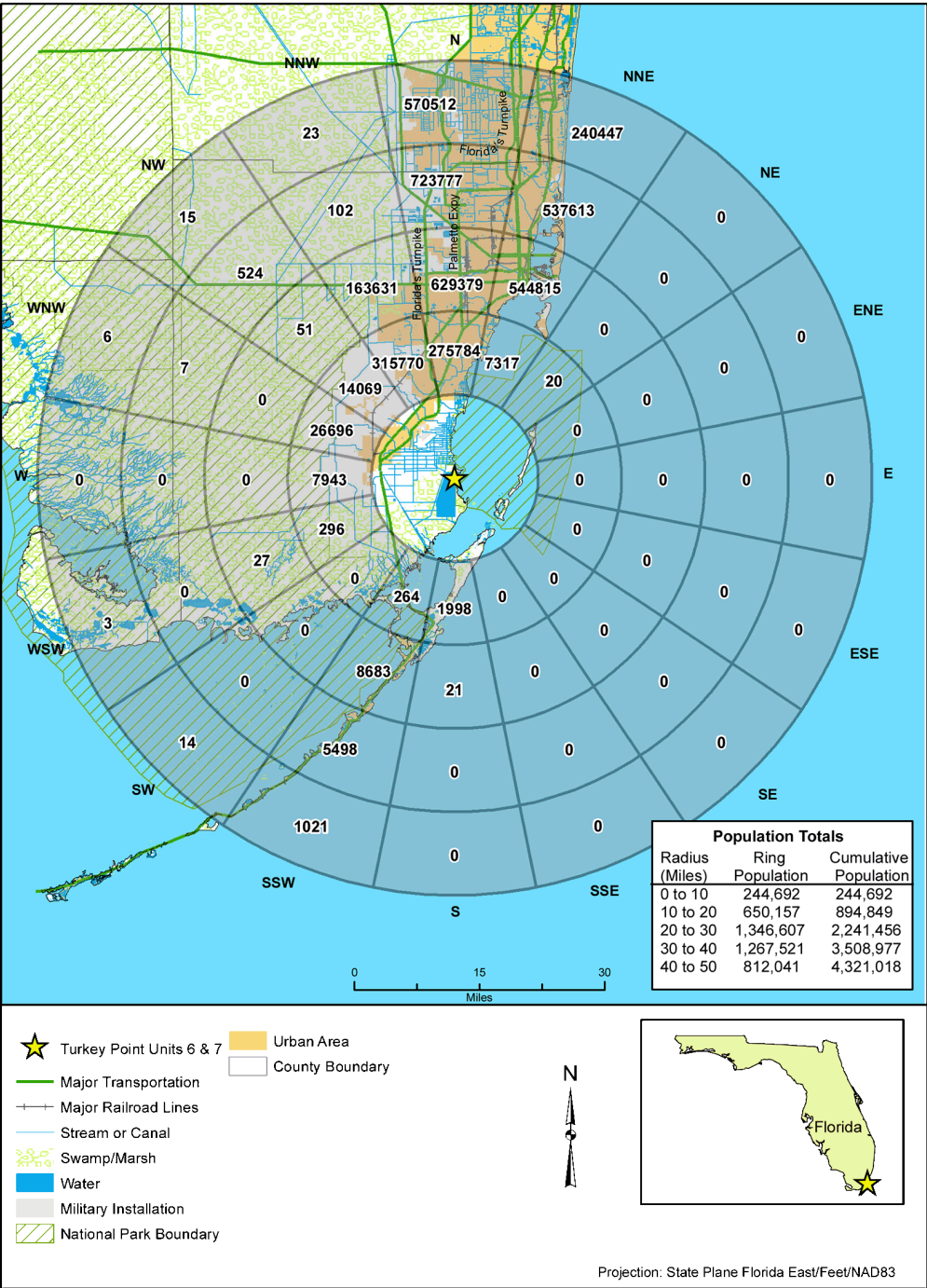
Figure 2.1-219 50-Mile 2030 Resident Population Distribution



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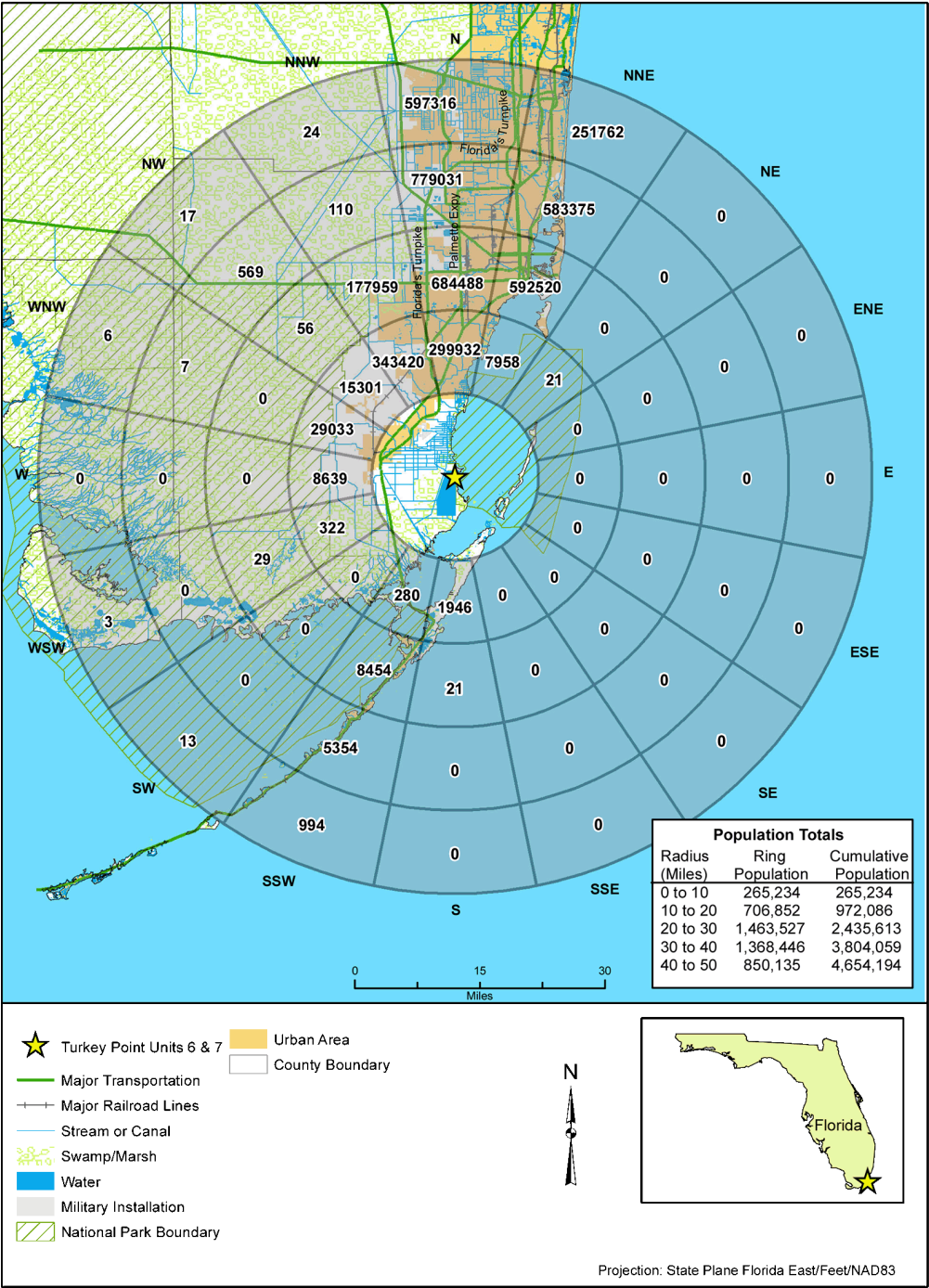
Figure 2.1-220 50-Mile 2040 Resident Population Distribution



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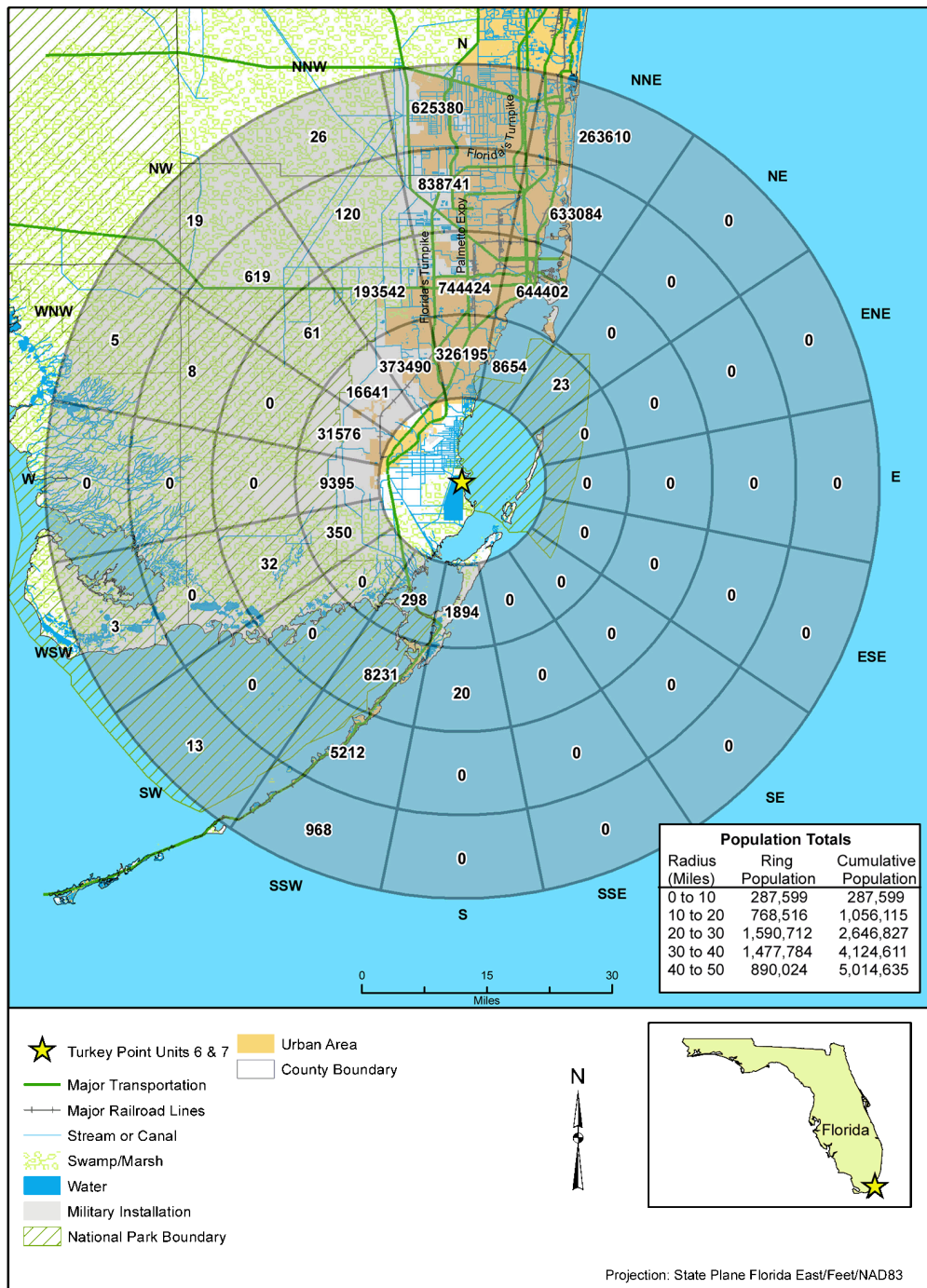
Figure 2.1-221 50-Mile 2050 Resident Population Distribution



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PTN COL 2.1-1

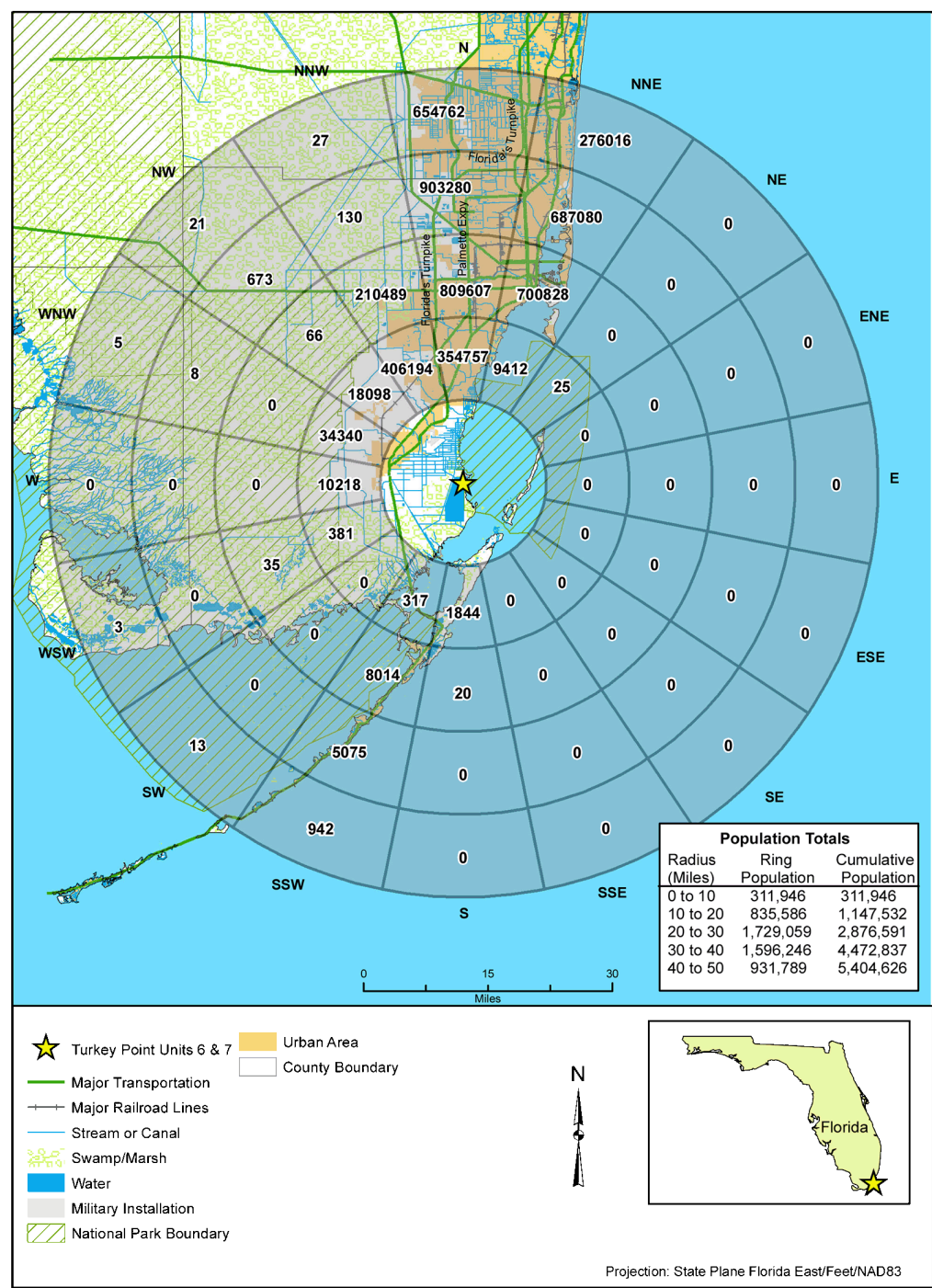
Figure 2.1-222 50-Mile 2060 Resident Population Distribution



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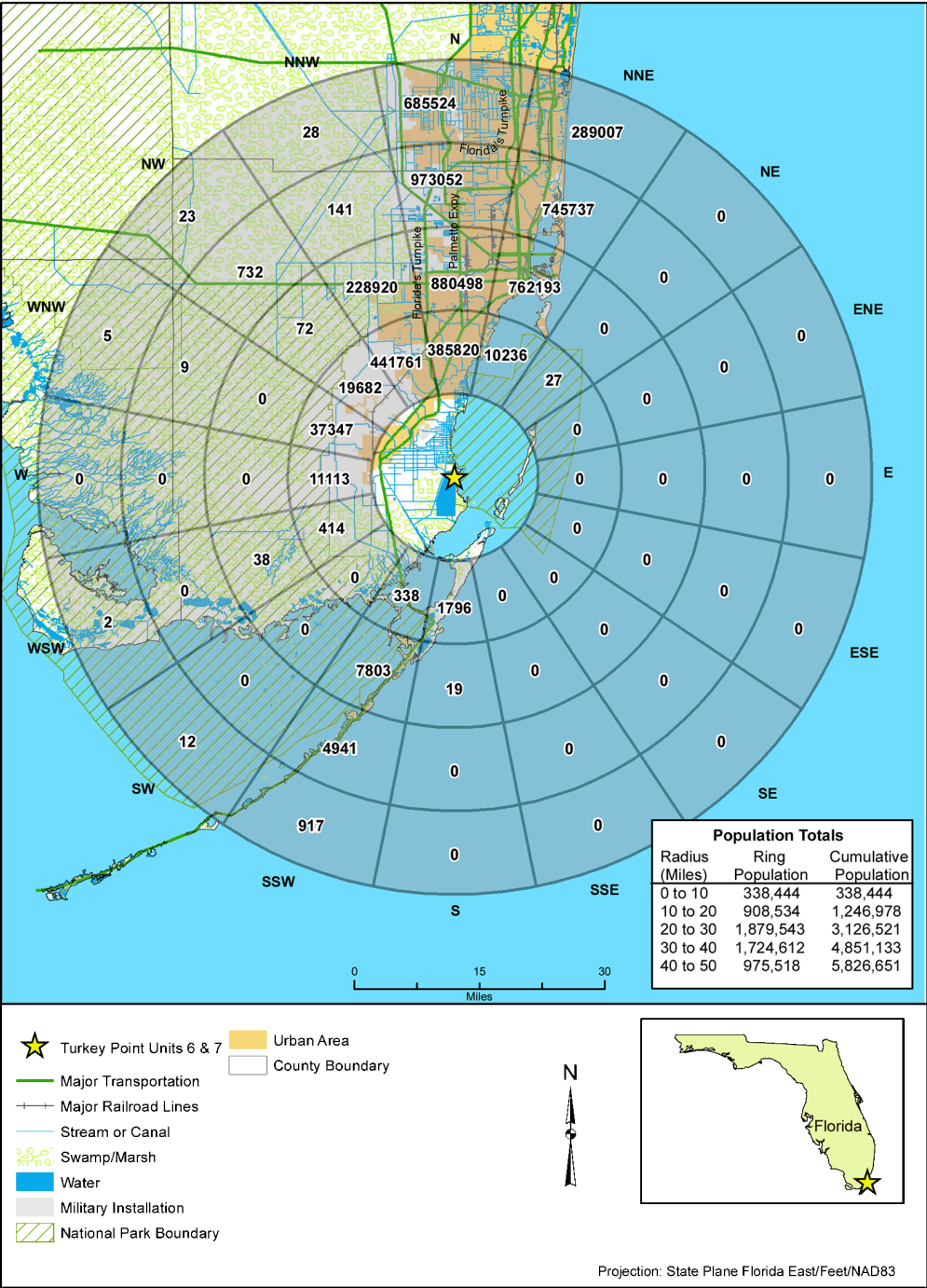
Figure 2.1-223 50-Mile 2070 Resident Population Distribution



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PTN COL 2.1-1

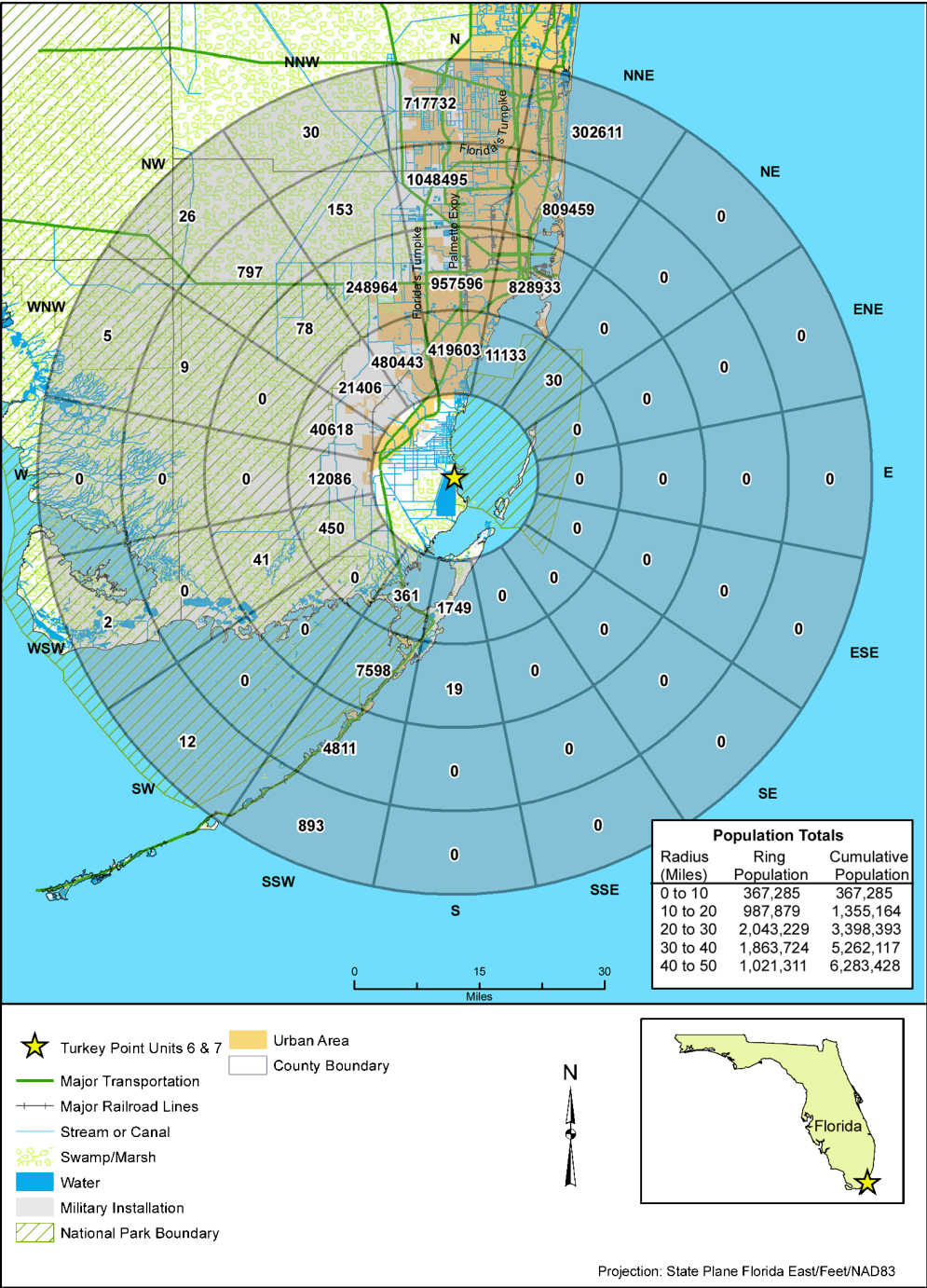
Figure 2.1-224 50-Mile 2080 Resident Population Distribution



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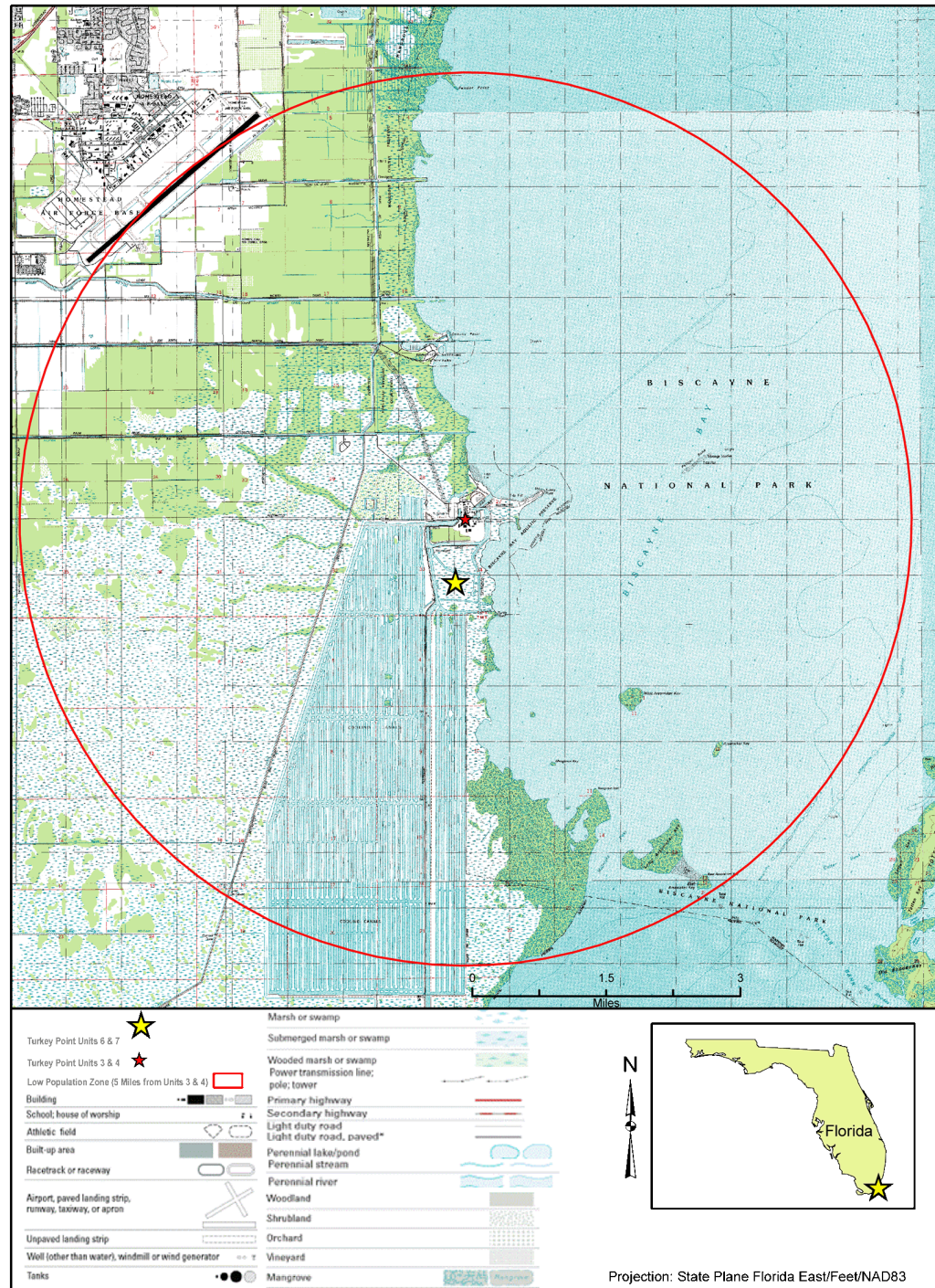
Figure 2.1-225 50-Mile 2090 Resident Population Distribution



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Figure 2.1-226 Low Population Zone



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Figure 2.1-227 Comparison to RG 4.7 Siting Criteria

