

References

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Table A2-1. Landcover types and floater attractiveness values.

Landcover Type	GIS color (Figure 1)	Attractiveness Value
Jay habitat	Red	4
“Corridor”	Orange	3 or 2 ^a
Neutral matrix	Yellow	2
Dense forest	Dark Green	1
Open water	Black	0

a Corridor attractiveness was reduced to 2 for low dispersal runs to give it the same attractiveness as the dominant matrix class.

Table A2-2. Default settings for demographic parameters assumed in the simulation model, for Florida Scrub-Jays in optimal and suburban or suboptimal conditions.

<u>Parameter</u>	<u>Optimal conditions</u>		<u>Suburban or suboptimal conditions</u>	
	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>
Survival				
1 st Year Helper	0.580 ^a	0.740 ^a	0.480 ^a	0.480 ^a
Older Helper	0.625 ^a	0.740 ^a	0.480 ^a	0.480 ^a
Novice Breeder	0.740	0.740	0.480	0.480
Experienced Breeder without Helper(s)	0.770	0.770	0.770	0.770
Experienced Breeder with Helper(s)	0.80	0.80	0.850	0.850
Fedundity				
Novice Breeder	0.50 ^b		0.22 ^b	
Experienced Breeder without Helper(s)	0.57 ^b		0.22 ^b	
Experienced Breeder with Helper(s)	0.77 ^b		0.22 ^b	

a Includes disappearances (see Stith (1999) for detailed explanation).

b Production of new 1st year helpers, not fledglings.

Table A2-3. Settings for dispersal parameters assumed in the simulation model, for Florida Scrub-Jays, high versus low dispersal.

<u>Parameter</u>	<u>High dispersal (31a)</u>		<u>Low dispersal (29)</u>	
	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>
“Delay-and-foray” Dispersal				
Assessment sphere (radius – no. territories)	4	7	4	7
Probability of settling with unpaired breeder	1	1	1	1
Probability of settling in empty territory	0.75	0.75	0.75	0.75
“Floater” Dispersal				
1 st Year Helper – proportion disappearing jays becoming floaters	0.75	0.50	0.75	0.25
Older helper – proportion disappearing jays becoming floaters	0.75	0.50	0.75	0.25
Probability of settling with unpaired breeder	1	1	1	1
Probability of settling in empty territory	0.5	0.5	0.5	0.5
Probability of settling as helper	0	0	0	0
Detection radius (meters)	1000	1000	1000	1000
Daily Survival in scrub	0.9988	0.9988	0.9988	0.9988
Daily Survival in non-scrub	K-M ^a	K-M ^a	0.87	0.87
Daily movement distance	Inverse ^b	Inverse ^b	Inverse ^b	Inverse ^b

a Daily survival rates obtained from Kaplan-Meier curve (derived from radiotelemetry data - see chapter 4 in Stith (1999) for further explanation).

b Daily movement distances obtained from inverse function (derived from radiotelemetry data - see chapter 4 in Stith (1999) for further explanation).

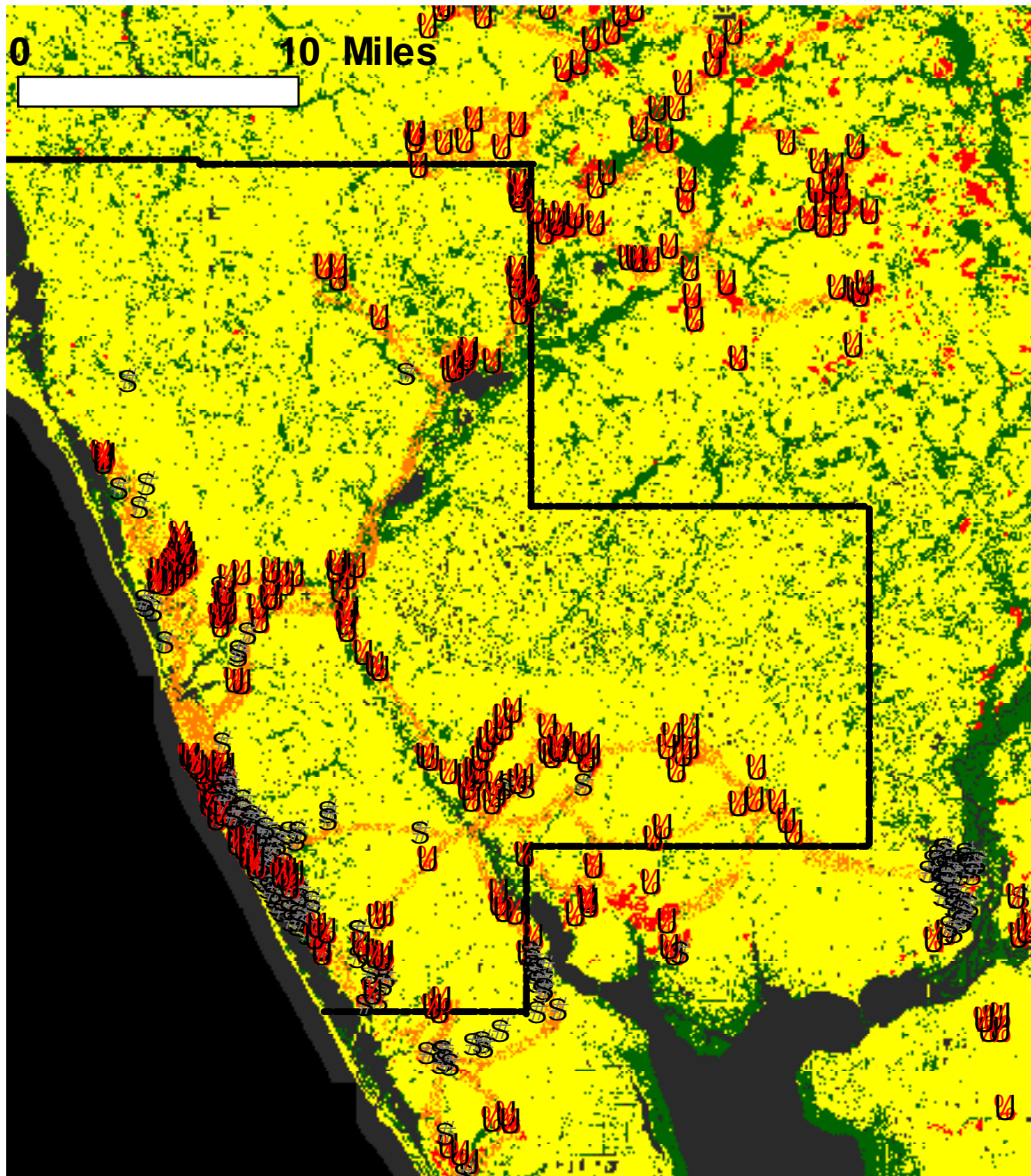


Figure A2-1. Map of Sarasota and adjoining counties showing landcover classes (yellow is neutral matrix, black is open water, dark green is forest, red is jay habitat, orange is hypothetical corridor), and jay territories (red squares are potential optimal habitat; grey circles are suburban territories).

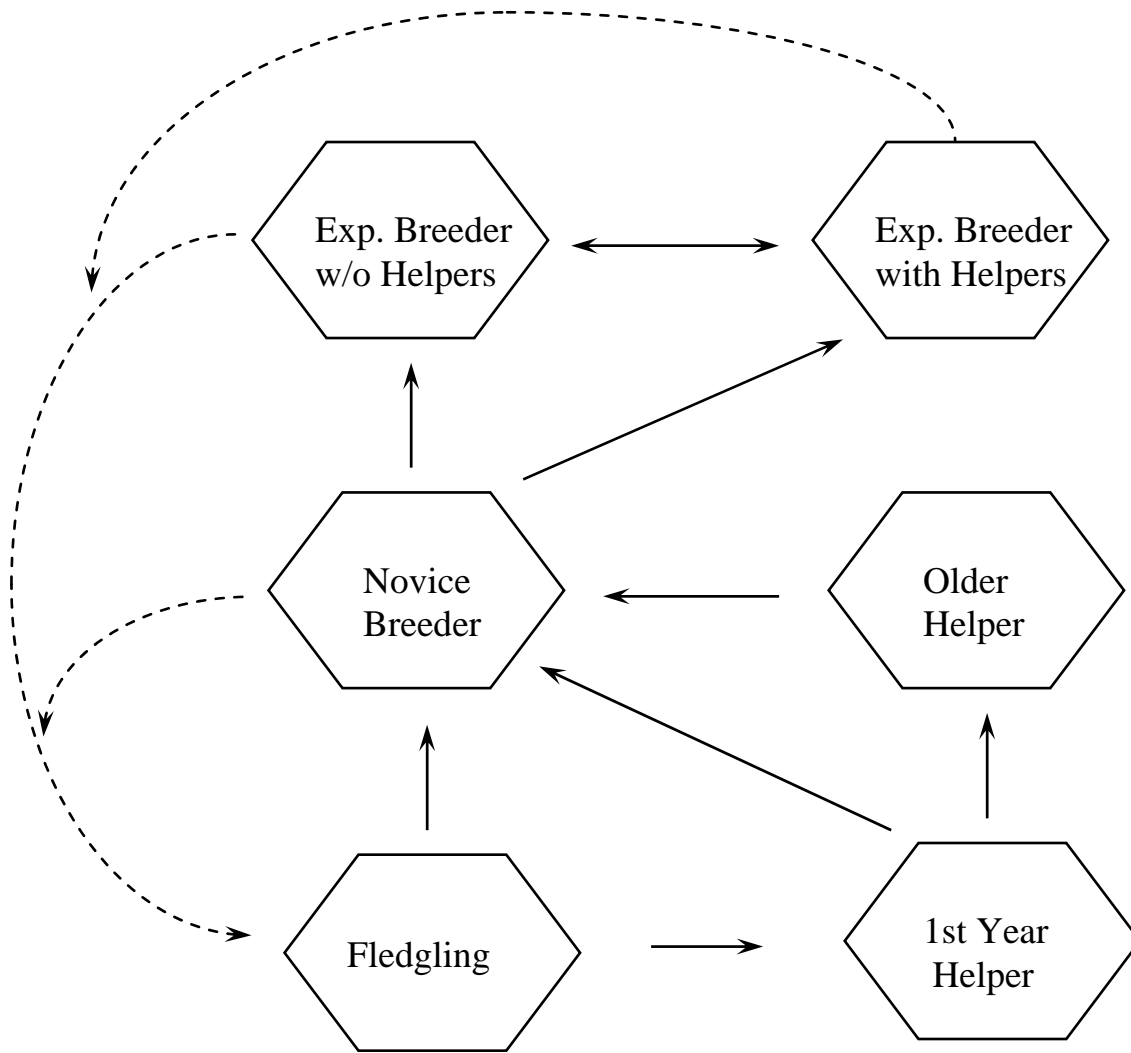


Figure A2-2. Florida Scrub-Jay life cycle used in the simulation model, showing possible annual transition pathways (solid arrows) and production of offspring (dashed arrows).

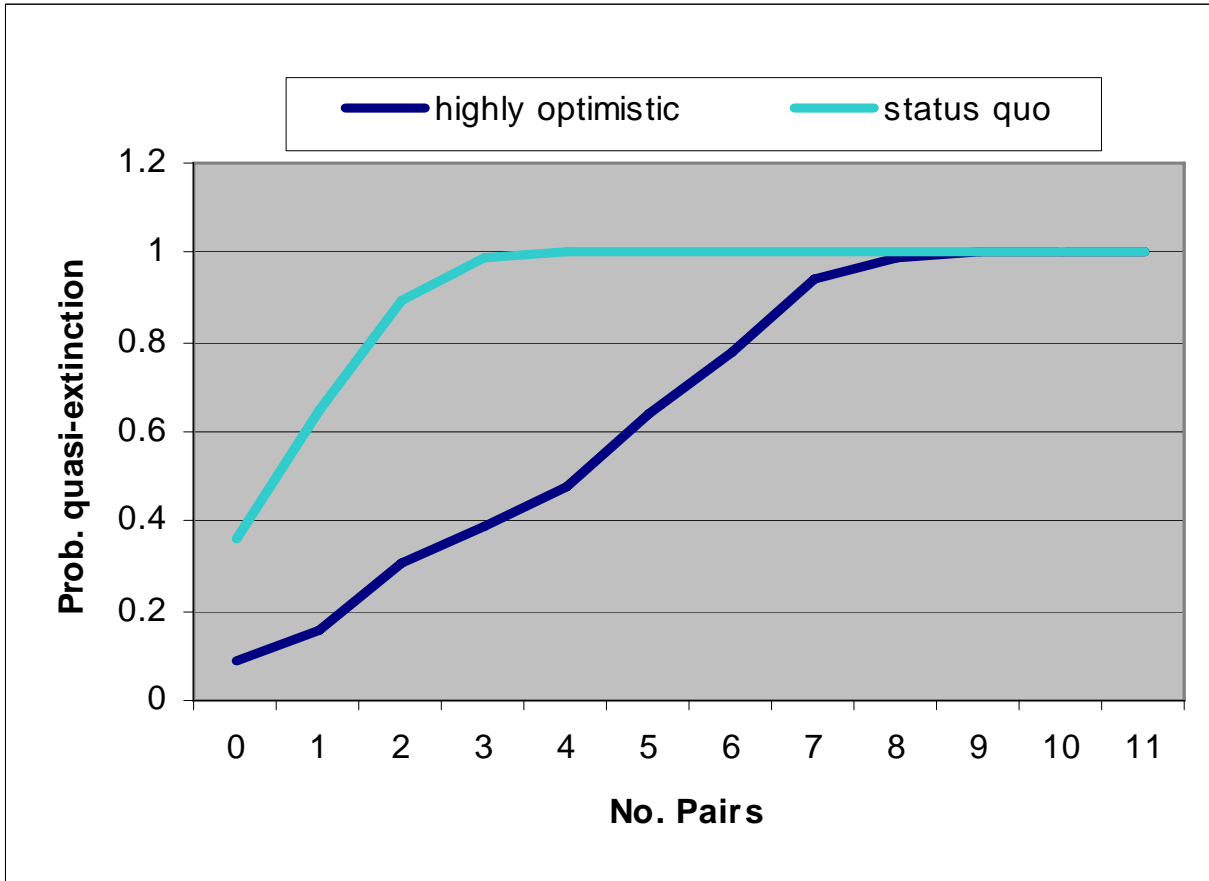


Figure A2-3. Quasi-extinction graph for 2 landscape scenarios (status quo vs. highly optimistic) showing probability of falling below a given number of pairs.

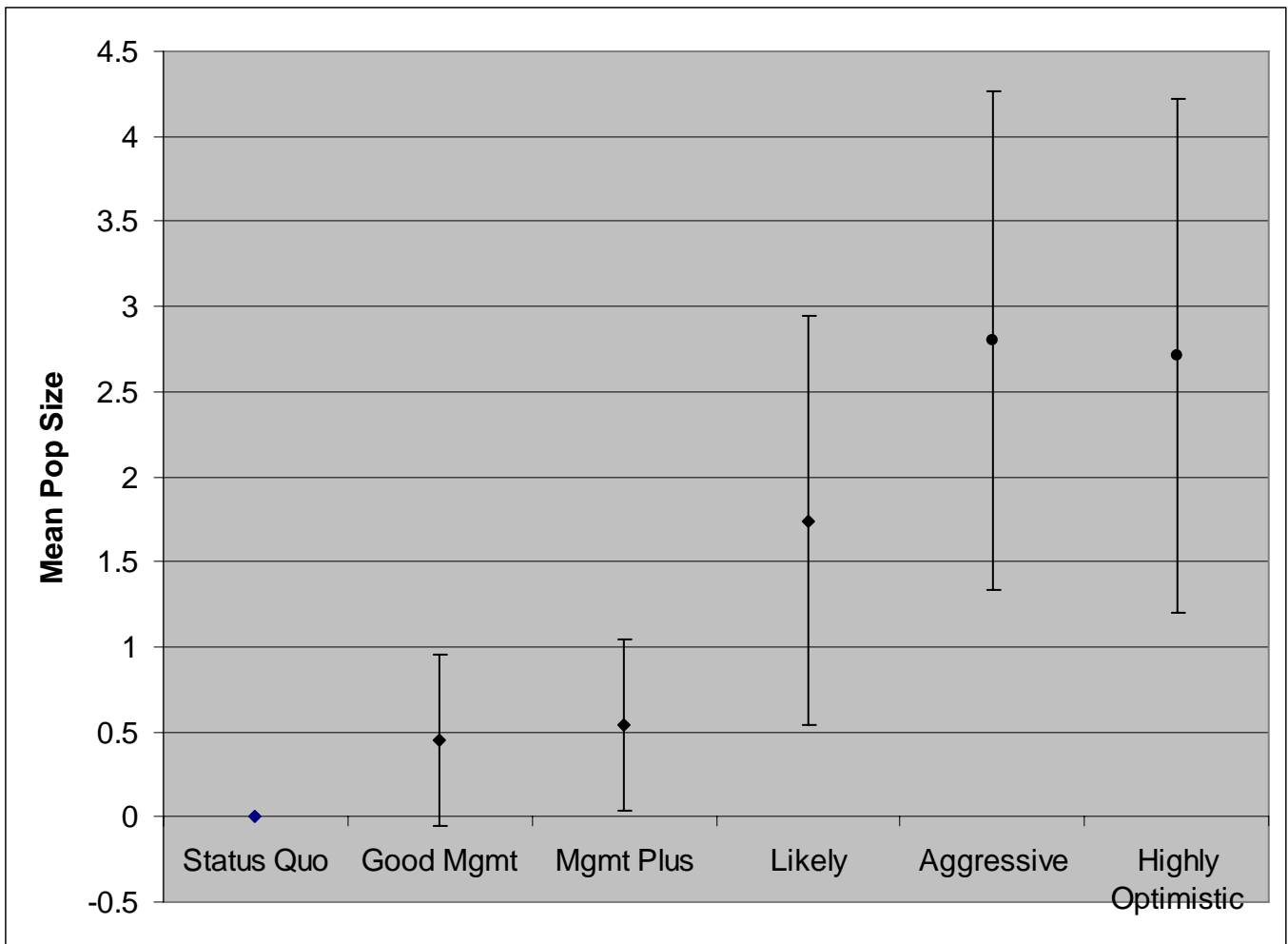


Figure A2-4. Mean ending population sizes (\pm one standard deviation) for different conservation strategies as described in Appendix 3.

Appendix 3. Comparative viability of alternative reserve scenarios for Florida Scrub-Jays in Sarasota County

As a primary means of examining the outcomes of a range of management decisions associated with this HCP, we conducted a series of simulations using the spatially explicit model described elsewhere in this document (Appendix 2). These simulations tested Florida Scrub-Jay survival and persistence under various land acquisition and management scenarios that, at least conceptually, could occur within Sarasota County over the coming decades. In order to span the widest possible range of possible conservation scenarios, we conducted these simulations on six different hypothetical landscape configurations and management actions. These ranged from a “Status Quo” scenario (no further land acquisition after 2004, limited habitat management on publicly owned tracts) to a highly optimistic scenario (all potentially usable Florida Scrub-Jay habitat in the county is acquired, habitat restoration and ongoing management are optimized for scrub-jays, and jays are translocated to all unoccupied territories from subpopulations outside the county). These simulations provided estimates of extinction and quasi-extinction risk, as well as mean expected population size following the simulated time period. These results provide reasonable predictions about the likely outcome of different possible actions by Sarasota County, as they affect the long-term viability of (1) the overall Florida Scrub-Jay population, and (2) jays occupying individual subregions and habitat patches within the County.

In this Appendix we summarize the results of our simulations. We present these hierarchically, representing three levels of spatial resolution and site-specific detail. Specifically, Section I provides (1) a countywide overview of the results, while Section II provides “drilled down” regional analyses that refer to data presented at (2) regional and (3) patch-to-patch resolution. Maps of these regions and patches are shown in Figures A3-3, A3-4, and A3-5.

Simulation scenarios and parameters. We ran each scenario for 100 years, and repeated each run 100 times to provide a statistically robust picture of the projected outcome for each scenario. The individual-based model used for these simulations and descriptions of parameters used in each of the six scenario simulation are described in detail in Appendix 2.

High vs. low dispersal rates. Central to the discussion of simulation results is uncertainty associated with the simulation model itself. Although the Florida Scrub-Jay is one of the most intensively studied bird species in the world, uncertainty still exists as to how they disperse across fragmented landscapes. Therefore, to be conservative and inclusive with respect to this uncertainty, we ran each scenario using two sets of dispersal-parameter settings, corresponding to “high” and “low” dispersal ability (see Appendix 2 for details). All settings were identical except for certain parameters affecting dispersal. In our discussion of the simulation results below, we distinguish between “high” and “low” dispersal simulations.

Accompanying each section, we present a set of tables for the 6 primary scenarios, showing the assumed starting population size for territories in native and suburban habitat, as well as the maximum potential population size (measured as number of pairs of jays) in native habitat. We refer to this maximum potential population size as “K”. Each table also presents the primary simulation results: extinction and quasi-extinction risk, and mean population size (plus its standard deviation) at the end of the simulated 100 years. Two values are provided for each primary output statistic, reflecting the results of the “low” and “high” dispersal simulations.

Viability criteria. We interpreted the comparative population viability of alternative reserve scenarios principally by comparing their extinction probabilities. Jay populations with extinction probabilities at or below 0.05 (i.e., having 5% or lower risk of total extinction any time during the 100-year simulation period) were considered safe from extinction, or maximally viable. Larger jay populations (i.e., greater than 20 territories) exhibiting a 10% or lower chance of dropping below 10 territories any time during the 100-year simulation period were considered at low quasi-extinction risk.

Note that the extinction and quasi-extinction estimates are “interval” values, representing the lowest value reached any time during the simulation, rather than “terminal” values that represent the probability at the end of the 100 years. Thus, an extinction or quasi-extinction value of 1.0 can occur for populations that actually may be viable if the starting population size was very small. For example, any patch that is empty at the beginning of a simulation will automatically have an extinction risk of 1.0, since the population was “extinct” at the beginning of the interval. An initially empty patch may be recolonized and grow during a simulation. Small patches with potential to support only a few territories may repeatedly go extinct and be recolonized. Such patches have an extinction risk of 1.0, yet their occupancy rates may be high owing to recolonization from nearby sources. It is important to note that such small patches can increase the viability of their constituent metapopulation by increasing the overall effective population size and by providing occasional colonists themselves.

Because extinction risk by itself can be a misleading metric, we emphasize that the mean ending population size after 100 years provides important additional information about the viability of a population. For example, mean ending population size is a useful measure of how well an initially unoccupied patch becomes colonized. A patch that starts out unoccupied but tends to become occupied over time can have a mean ending population that may approach K, the maximum value the population could have achieved. We suggest that a mean ending population on the order of 50% or more of K after 100 years should be considered reasonably viable even in cases where extinction or quasi-extinction risk is high.

Effects of jays in Charlotte and Manatee Counties. A significant number of Florida Scrub-Jays occur in territories located in adjacent Manatee and Charlotte counties, but within easy dispersal distance of Sarasota populations (Figs. A3-1 and A3-2). As dispersal clearly occurs across county boundaries, the numbers and distribution of jays in Manatee and Charlotte counties will influence the viability of jay populations in

Sarasota County. Because we do not know in advance how jays in adjacent counties will be protected and managed, we conducted a duplicate set of simulations for Sarasota County in which the presence or absence of jay territories in adjacent counties represented the only difference. The following discussions and tables principally address Sarasota County jays in the absence of influence from jays in neighboring counties. However, where appropriate, we do comment on the influence of neighboring counties.

Translocation. To test for the possible effects of intensive translocation efforts in the County, we assumed that successful translocation had preceded each of two model scenarios (Management Plus and Highly Optimistic). This allowed us to study viability under the best possible conditions for these two scenarios, thereby “bracketing” our assumed conditions in the models. In general, the effects of assumed intensive translocations were modest, both countywide and in individual patches. This revealed that heavy investment in translocation should not play a major role in this HCP. However, in a few cases (e.g., North Port East), targeted translocation would improve the expected results locally, and these are indicated in the patch-level discussions.

County level simulation results

Simulation results conducted for Sarasota County as a whole (Table A3-1) demonstrate that maintaining the “Status Quo” is an inadequate strategy for protecting the county’s Florida Scrub-Jay population. This holds for both high- and low-dispersal runs. Mean ending population size for the entire county is only 20-30 pairs after 100 years, extinction probabilities range from 3% to 15%, and quasi-extinction risk ranges from 15% to 41%. This result is not surprising, given that under the “Status Quo” scenario (i.e., the condition under which the County exists today) only 57 potential Florida Scrub-Jay territories exist on protected land (i.e., $K=57$), and except for Oscar Scherer State Park, protected jays are scattered in small, isolated clusters all around the county. Under today’s configuration, Sarasota County remains at significant risk of losing its Florida Scrub-Jays altogether. A significant, unexpected finding of our simulations is that even adding the jays in Manatee and Charlotte counties provides almost no improvement in the viability of Sarasota County under the “Status Quo” protection and management scenario.

On the positive side, county-wide viability can be substantially improved simply by restoring and actively managing existing protected areas. Under the “Good Management” scenario (Table A3-1; $K=158$), mean ending population sizes are 64 -101 pairs after 100 years, and both extinction and quasi-extinction risks drop below 5%. Note, however, that inspection of the 4 regions (see regional discussion below) indicates that only two viable regional populations (Central and Southwest) exist under this scenario. As articulated elsewhere, a safer way to achieve the broader goal of long-term persistence and genetic viability of Florida Scrub-Jays in the County is to strive for a minimum of three viable core populations, preferably representing at least three of the four subregions of the County. Therefore, good management on existing public lands is still inadequate to meet the goals of the HCP.

The situation would be slightly better under a hypothetical “Management Plus” scenario, which is identical to “Good Management” but all potential territories begin the simulation occupied, as if jays had been translocated to the unoccupied territories (Table A3-1; K=158). Mean population size ranges from 70 to 115 pairs. However, this scenario would require translocating 99 pairs of jays from unprotected or out-of-county sites. Such a huge-scale translocation effort is impractical, and not warranted by the slight increase in viability. This marginal increase in viability is an important result of the model, as it underscores the fact that creating a larger starting population size via a massive translocation effort is not necessary, and certainly not cost-effective, as a major component of the HCP.

The “Modest Action” scenario (moderate management and selected acquisition of new habitat) produces a mean ending population of 54 – 91 pairs after 100 years (Table A3-1; K=151). These values are slightly lower than the “Good Management” scenario, in part because the number of potential territories is slightly less (151 vs. 158), and also because the “Modest Action” scenario contains more small, isolated jay territories that go extinct more easily. This comparison underscores the importance of restoring habitat near existing jays to maximize the number of contiguous territories in the vicinity of, or within, within existing reserves. Note that under this scenario, under conditions of low dispersal the simulation still produces significant quasi-extinction risk (10%).

The “Aggressive Action” scenario (intense management including significant habitat restoration, and ambitious acquisition of new habitat) produces a mean ending population of 90 – 150 pairs after 100 years (Table A3-1; K=214). However, as discussed below (see Regional discussion), under this scenario only two of the four regional populations (Central and Southwest) remain viable unless the adjoining counties are added to the simulation. Maintaining jays in Charlotte County greatly improves the viability of the East region, and jays in southern Manatee County greatly improve the viability of the Northeast region.

To define the absolute upper limit to the possible Florida Scrub-Jay population in Sarasota County, we ran a simulation called “Highly Optimistic” (all remaining Florida Scrub-Jay habitat acquired, and all habitat intensely managed to remain at optimal quality). This scenario begins with all potential habitat managed in optimal condition and all potential territories occupied (i.e., through translocation) throughout the county. Under this scenario, many areas that are currently classified as “suburban” are assumed to have been converted to “optimal.” The “Highly Optimistic” scenario would result in a mean ending population of 103 – 180 pairs after 100 years (Table A3-1; K=226). Again, for both the high and low dispersal simulations, even under this spectacularly optimistic scenario only two of the county’s four regional populations (Central and Southwest) remain viable. Again, adding the presence of managed Florida Scrub-Jays in Charlotte and Manatee counties greatly improves the viability of both the East and the Northeast regions (see Regional discussion below).

Table A3-1. Sarasota County Population Simulation Statistics

Acquisition Restoration Translocation	None None None	None Intense None	None Intense Intense	Moderate Moderate None	High Intense None	Maximum Intense Intense
	“Status Quo”	“Good Mgmt”	“Mgmt Plus”	“Modest Action”	“Aggressive Action”	“Highly Optimistic”
Starting “native” population size	57	59	158	73	74	226
Potential “native” population size (K)	57	158	158	151	214	226
Starting “suburban” population size	92	90	90	76	76	76
mean end pop. size standard deviation	19.95 – 30.22 11.91 – 10.71	63.62 – 101.02 19.66 – 25.05	70.29 – 114.52 23.39 – 24.93	53.71 – 91.07 22.41 – 21.04	89.56 – 149.57 26.46 – 33.84	102.71 – 179.55 38.11 – 26.29
Percent change						
Extinction Risk	0.15 - 0.03	0.03 - 0.0	0.0 – 0.0	0.03 - 0.0	0.01 – 0.0	0.0 – 0.0
Quasi-extinction Risk (10 pairs)	0.41 - 0.15	0.04 - 0.0	0.03 - 0.0	0.10 - 0.0	0.02 - 0.0	0.0 – 0.0

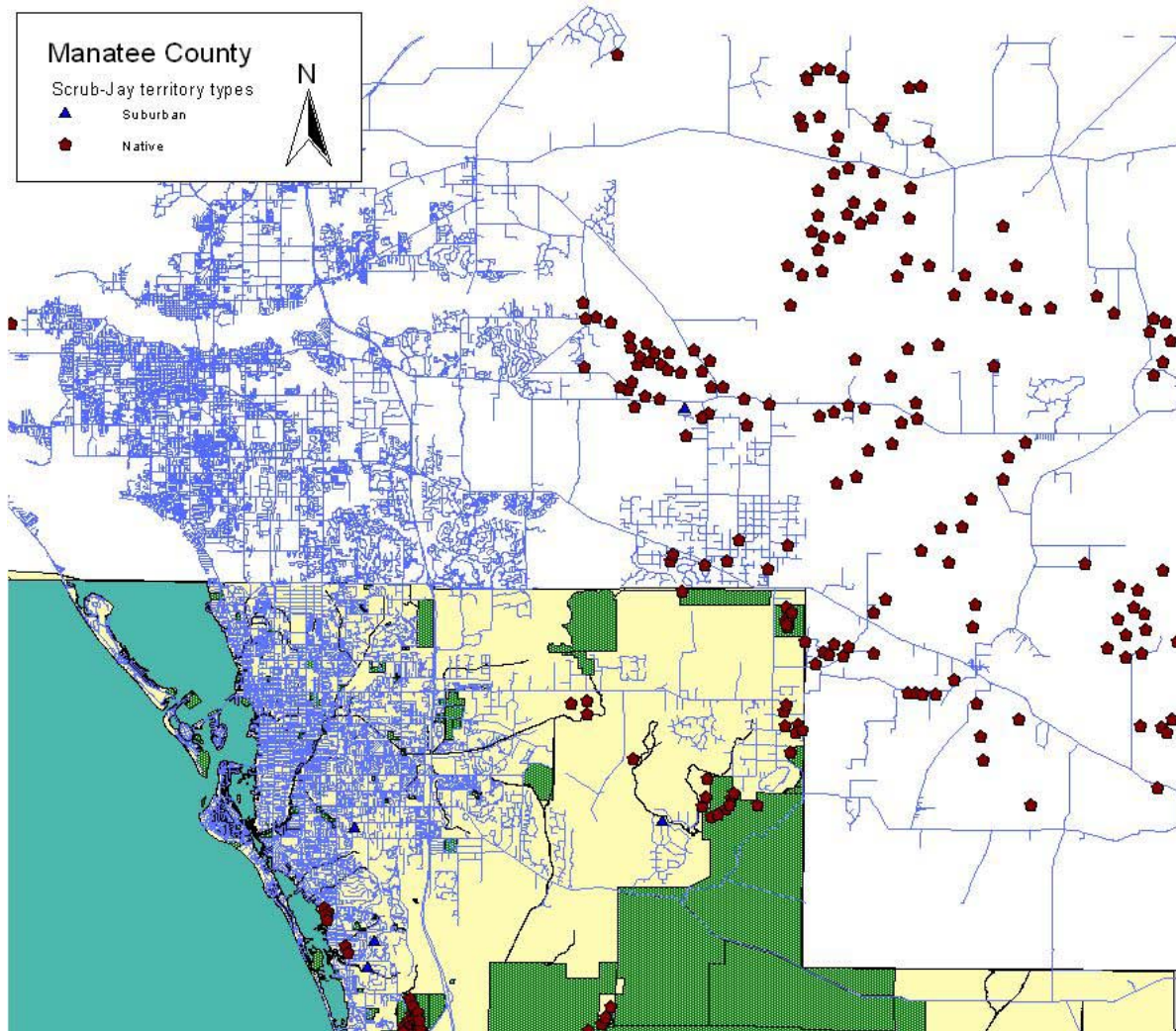


Figure A3-1. Map showing jay territories in Manatee County that were used in simulations.

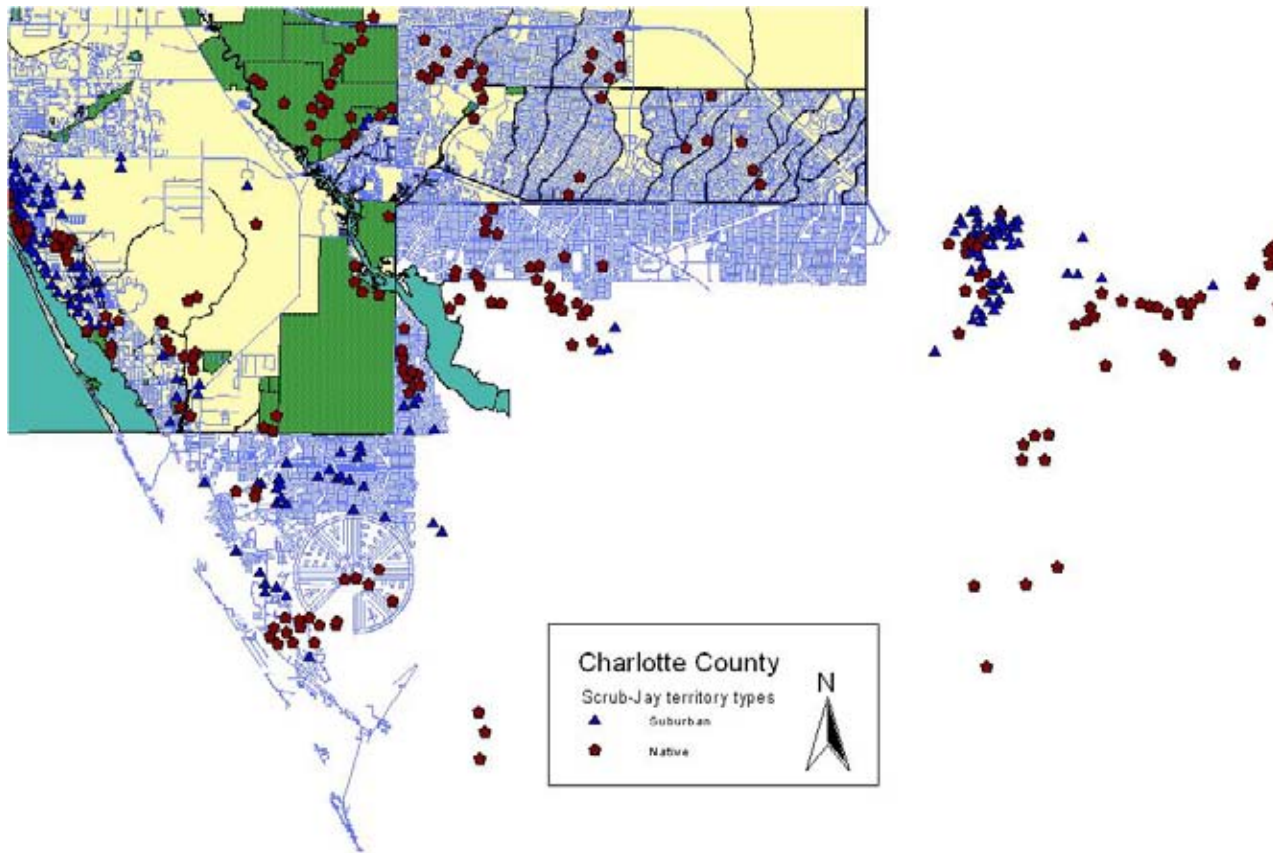


Figure A3-2. Map showing jay territories in Charlotte County that were used in simulations.

Regional simulation analyses

We divided the county into 4 regions: Northeast, Central, Southwest, and East (Fig. A3-3). In this section we analyze the viability of each region and highlight the projected fates of the constituent subregions under the alternative scenarios described above. The subregions are shown in Figure A3-4.

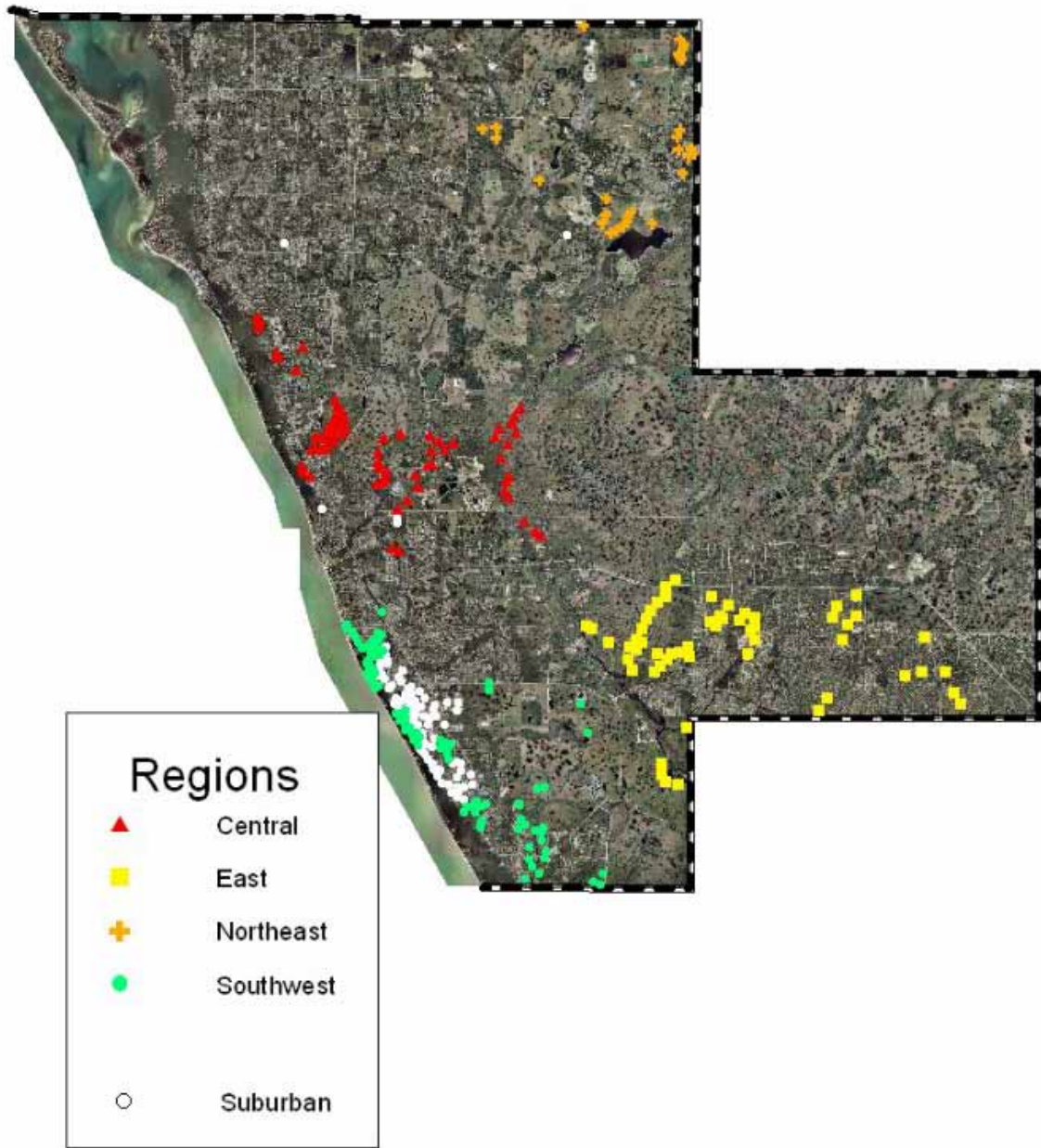


Figure A3-3. Map showing four regional subpopulations of Florida Scrub-Jays in Sarasota County. Dots represent both actual and potential territories, including those that are currently unoccupied but viewed as potentially restorable.

Northeast Region. These jay territories lie in the northeastern corner of Sarasota County along the Manatee County border and in or near the north end of Myakka River State Park. Simulations that excluded the influence of Manatee County jays showed extremely poor viability of Florida Scrub-Jays in this region. In the absence of Manatee County jays, even the Highly Optimistic scenario (in which even those jays currently classified as ‘suburban’ are assumed to be managed under optimum habitat conditions) produced mean ending populations of only 6 to 12 pairs ($K=28$) and high extinction and quasi-extinction risks (0.14 and 0.82, respectively; Table A3-2). Including Manatee County in the simulations significantly improved the Highly Optimistic scenario, but the other scenarios still performed poorly. Of the four regions of Sarasota County, the Northeast is by far the most vulnerable. Preserving jays in this region of the county will require extensive habitat management, regular translocation, and significant cooperation with – perhaps even investment in -- Manatee County. Sarasota County should consider cooperating with habitat protection and management in adjacent areas of Manatee County in order to maximize the recovery potential of jays in the Northeast region. It should be noted that proper management of the scrub habitat in this region can help preserve jays in the other regions of the County even in the absence of permanently occupied habitat locally, because of the importance of these scrubs as corridors and stepping stones for jays dispersing between Sarasota and Manatee counties.

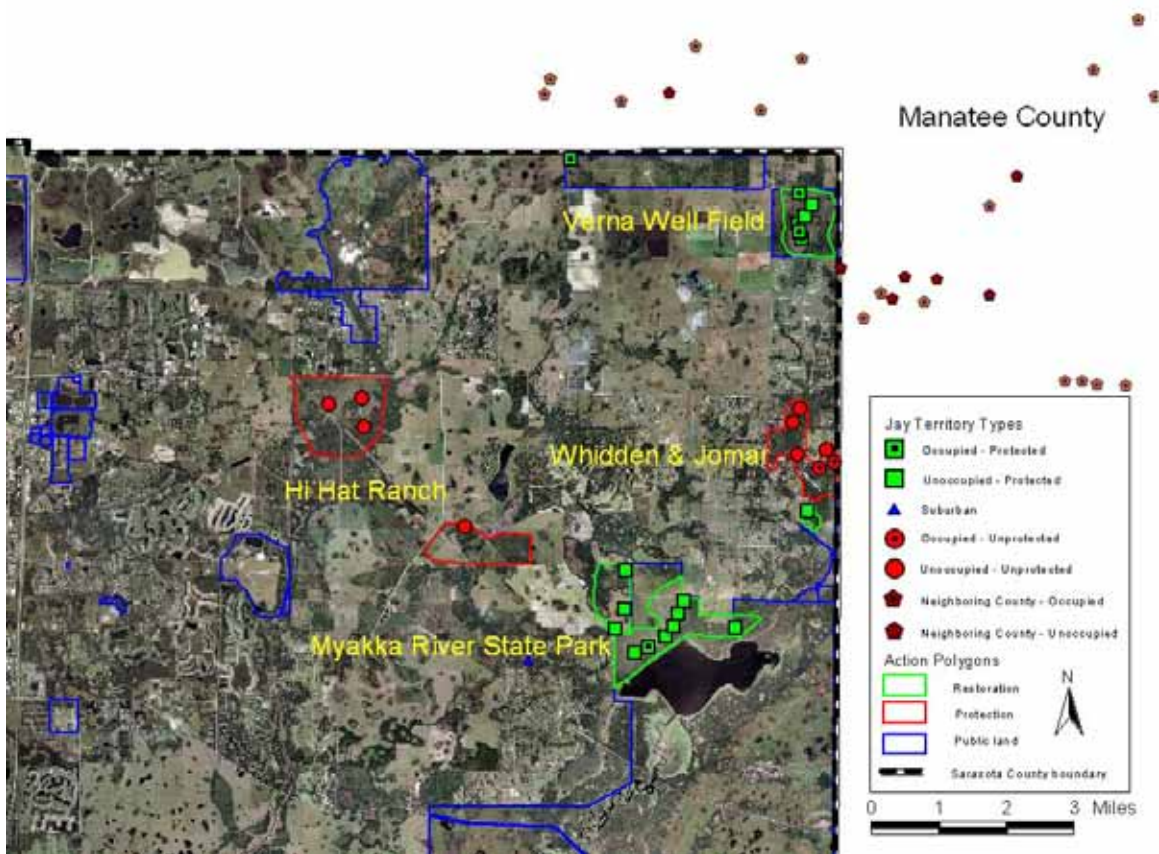


Figure A3-4.1. Northeast Region showing current and potential Florida Scrub-Jay territories. Green polygons indicate public land needing restoration; red polygons indicate areas that should be prioritized for protection.

Central Region. The Central region of Sarasota County includes Oscar Scherer State Park, which harbors the single most important core population of Florida Scrub-Jays in the County. Nevertheless, viability of even this region is marginal for the Status Quo, Good Management, and Modest Action scenarios, because quasi-extinction risks remain high (Table A3-3). However, mean ending population sizes tend to be large relative to K, indicating that this regional population is comparatively stable despite having high variance among simulation runs. Statistics for the Management Plus, Aggressive Action, and Highly Optimistic scenarios show quite high viability. This is the most vital region in the County for Florida Scrub-Jay persistence, and warrants careful evaluation at the subregion and patch level (see below). In general, patches closest to Oscar Scherer SP are more viable than patches farther away. For example, a small patch that is near Oscar Scherer SP such as Bayonne (Sarasota Square) (Table A3-19), may show a higher-than-expected mean population size compared to a more distant but larger patch, such as the Myakka River Corridor (Table A3-24). Manatee and Charlotte Counties have no significant influence on persistence of jays in this region of Sarasota County, because of the distances and habitat boundaries separating Central region jays from those of the surrounding counties.

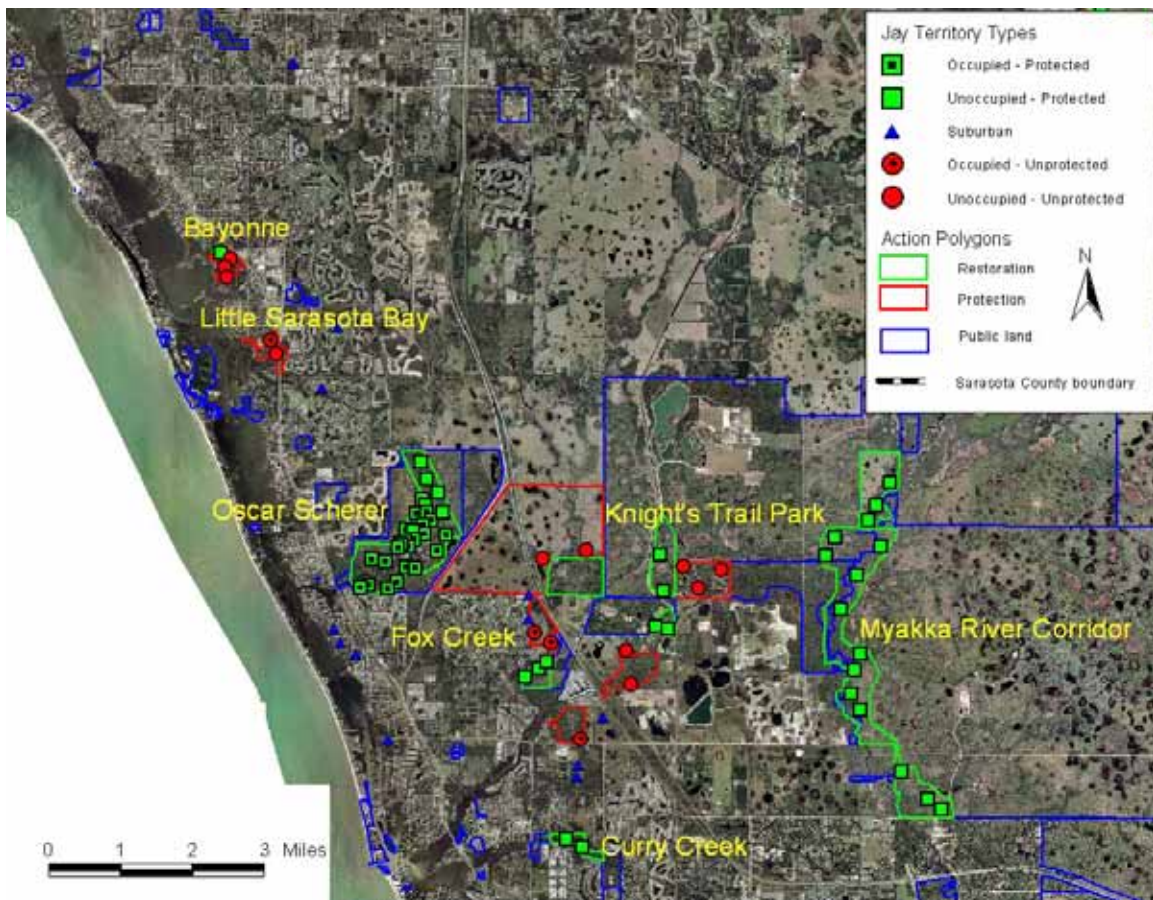


Figure A3-4.2. Central Region showing current and potential Florida Scrub-Jay territories. Green polygons indicate public land needing restoration; red polygons indicate areas that should be prioritized for protection.

Southwest Region. The Southwest region includes the important, well-protected populations of jays at Caspersen, Shamrock, and Lemon Bay. Surprisingly, this region has the potential to become the most viable in Sarasota County, exceeding even the Central region. This is because of the Southwest region’s larger subpopulation sizes and the greater contiguity of its patches. A key finding of our simulations is that viability of this region is poor for the Status Quo scenario, but becomes quite good under all the other scenarios, with low extinction and quasi-extinction risks under both low and high dispersal conditions (Table A3-4). Mean ending population sizes generally are considerably more than 50% of K. Charlotte County jays have no significant effect on this region of Sarasota County. Because of the large number of different configurations for protected habitat in this region, we recommend carefully studying the constituent subregion and patch level simulation tables below.

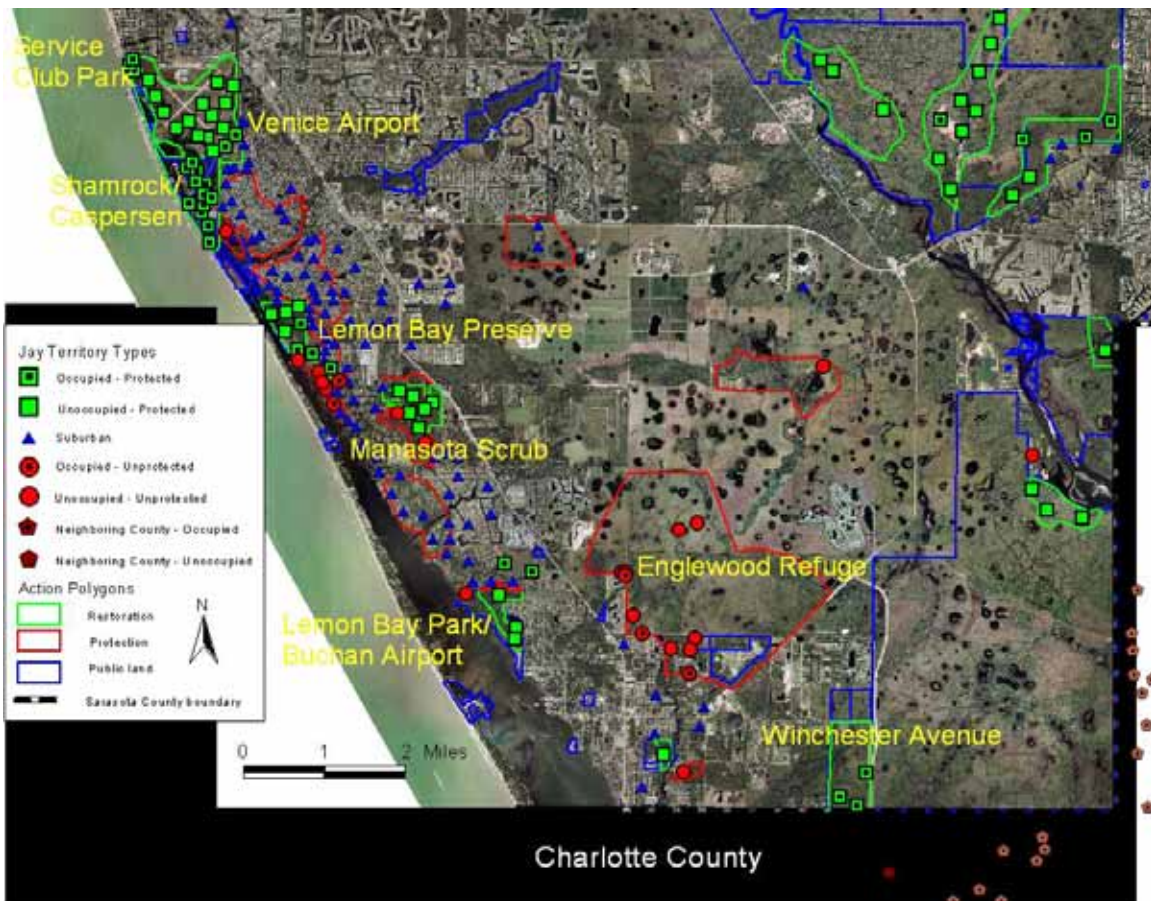


Figure A3-4.3. Southwest region showing current and potential Florida Scrub-Jay territories. Green polygons indicate public land needing restoration; red polygons indicate areas that should be prioritized for protection.

East Region. The Eastern region includes the most important habitat available for restoration in the entire county, providing the potential for important populations of jays at Deer Prairie Creek (including LOR) and North Port. The Status Quo scenario has poor viability by all measures (Table A3-5). Other scenarios have moderate to high extinction or quasi-extinction risk owing mainly to their small starting population size. The two scenarios that include translocations (Management Plus and Highly Optimistic) have much lower extinction risk than the other scenarios. Even without translocation, however, the mean ending population sizes for the Modest Action and Aggressive Action scenarios show stable or increasing trajectories under the high-dispersal conditions (Table A3-5). Charlotte County jays significantly increase the viability of this region for all but the Status Quo scenario. Compared to the other three regions, the Eastern region has the greatest potential to benefit from habitat management and translocation.

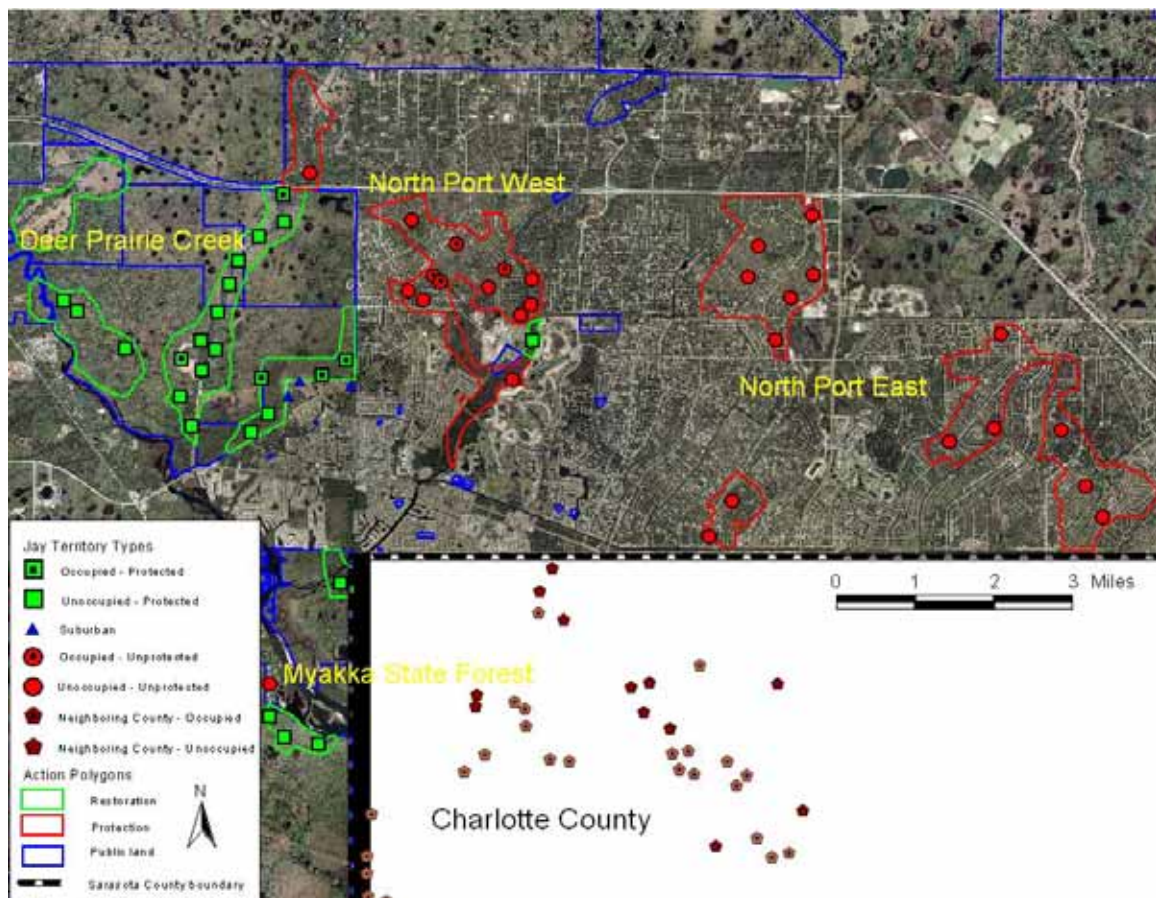


Figure A3-4.4. East Region showing current and potential Florida Scrub-Jay territories. Green polygons indicate public land needing restoration; red polygons indicate areas that should be prioritized for protection.

Table A3-3. Central Region Population Simulation Statistics

Acquisition Restoration Translocation	None None None	None Intense None	None Intense Intense	Moderate Moderate None	High Intense None	Maximum Intense Intense
	“Status Quo”	“Good Mgmt”	“Mgmt Plus”	“Modest Action”	“Aggressive Action”	“Highly Optimistic”
Starting “native” population size	21	21	53	25	25	68
Potential “native” population size	21	53	53	44	65	68
Starting “suburban” population size	10	10	10	6	5	0
mean end pop. size standard deviation	15.19 - 15.17 6.40 - 6.63	25.93 - 39.86 9.66 - 11.31	31.92 - 42.48 9.50 - 10.84	22.86 - 32.40 8.25 - 9.25	35.97 - 53.42 11.32 - 13.55	43.81 - 59.02 16.15 - 8.86
Extinction Risk	0.05 - 0.13	0.05 - 0.01	0.02 - 0	0.07 - 0.01	0.01 - 0	0.01 - 0
Quasi-extinction Risk (10 pairs)	0.67 - 0.66	0.26 - 0.19	0.10 - 0.05	0.28 - 0.18	0.12 - 0.06	0.07 - 0

Table A3-4. Southwest Region Population Simulation Statistics

Acquisition Restoration Translocation	None None None	None Intense None	None Intense Intense	Moderate Moderate None	High Intense None	Maximum Intense Intense
	“Status Quo”	“Good Mgmt”	“Mgmt Plus”	“Modest Action”	“Aggressive Action”	“Highly Optimistic”
Starting “native” population size	25	25	54	31	32	77
Potential “native” population size	25	54	54	53	73	77
Starting “suburban” population size	76	76	76	70	69	0
mean end pop. size standard deviation	11.77 - 14.80 7.65 - 6.56	42.74 - 47.48 9.61 - 9.44	44.91 - 48.86 8.70 - 7.72	39.85 - 48.87 8.64 - 7.89	58.33 - 66.67 11.37 - 9.26	63.42 - 71.29 12.47 - 7.21
Extinction Risk	0.20 - 0.06	0.02 - 0.01	0 - 0	0.02 - 0	0 - 0	0 - 0
Quasi-extinction Risk (10 pairs)	0.80 - 0.66	0.04 - 0.06	0.03 - 0.01	0.04 - 0.01	0.01 - 0	0.01 - 0

Table A3-5. East Region Population Simulation Statistics

Acquisition Restoration Translocation	None None None	None Intense None	None Intense Intense	Moderate Moderate None	High Intense None	Maximum Intense Intense
	“Status Quo”	“Good Mgmt”	“Mgmt Plus”	“Modest Action”	“Aggressive Action”	“Highly Optimistic”
Starting “native” population size	5	7	33	9	9	53
Potential “native” population size	5	33	33	37	48	53
Starting “suburban” population size	4	2	2	0	0	0
mean end pop. size standard deviation	0.02 - 0.23 0.14 - 0.63	4.21 - 12.04 6.76 - 9.49	8.27 - 19.00 7.75 - 8.30	1.56 - 11.12 4.11 - 9.28	3.88 - 23.40 7.07 - 13.23	18.34 - 37.00 12.68 - 10.03
Extinction Risk	1.0 - 0.99	0.71 - 0.42	0.32 - 0.06	0.85 - 0.42	0.71 - 0.27	0.16 - 0
Quasi-extinction Risk (10 pairs)	1.0 - 1.0	1.0 - 1.0	0.92 - 0.45	1.0 - 1.0	1.0 - 1.0	0.49 - 0.04

Patch Level Analyses

The Florida Scrub-Jays in Sarasota County are distributed in 24 reasonably discrete patches of currently or potentially suitable habitat. For purposes of modeling regional and local viability under the various protection scenarios, we identified and separately tracked each patch throughout each of the simulation runs. In this section we discuss how each patch would be expected to fare under the scenarios we simulated.



Figure A3-5. Map showing 24 patches or clusters of Florida Scrub-Jay territories (including potential territories on currently unoccupied habitat) in Sarasota County.

Verna Well Field

General description: The Verna Well Field site is in the extreme northeast corner of Sarasota County (see Fig. A3-4.1) and owned by the City of Sarasota. This population is within easy dispersal distance of the Whidden/Jomar population to the south, and to jays in neighboring Manatee County to the east and north (Fig. A3-4.1).

Protected areas: Protected jay habitat in this area includes the city-owned Verna Well Field (see Fig. A3-6). A total of 4-5 families were known to occupy this area in 2004. One somewhat isolated jay group was found on City property in marginal habitat WNW of the main population (see Fig. A3-6). As many as 7 families could be supported through intense habitat restoration, however, aggressive restoration efforts are needed to provide more optimal habitat for jays.

Protection potential: No jays are known to exist in nearby unprotected areas. Potential jay habitat exists both north and south of Verna Well Field, enough to support an additional 1 or 2 territories.

Simulation Results: Viability of this small population depends very heavily on the fate of Manatee County populations. All scenarios that excluded jays in adjacent Manatee County, even the “Highly Optimistic” scenario, show high extinction risk (Table A3-6) and low mean population trajectories. Adding Manatee County jays (Fig. A3-1) to the simulations changes the results substantially. The Highly Optimistic scenario extinction risk decreases from 0.85 to 0.19, and the mean trajectory increases from 1.39 to 5.67.

Recommendations: Because of the isolation and small population size of jays in this part of Sarasota County, aggressive management of the City-owned Verna Well Field property is especially important. From a biological standpoint, the most important management action is to protect and restore jay habitat in nearby Manatee County.

Verna Well Field Scrub existing pairs (2004) and potential territories

	Occupied 2004	Total Potential
Public-owned	5	7
Privately-owned	0	0
Total	5	7

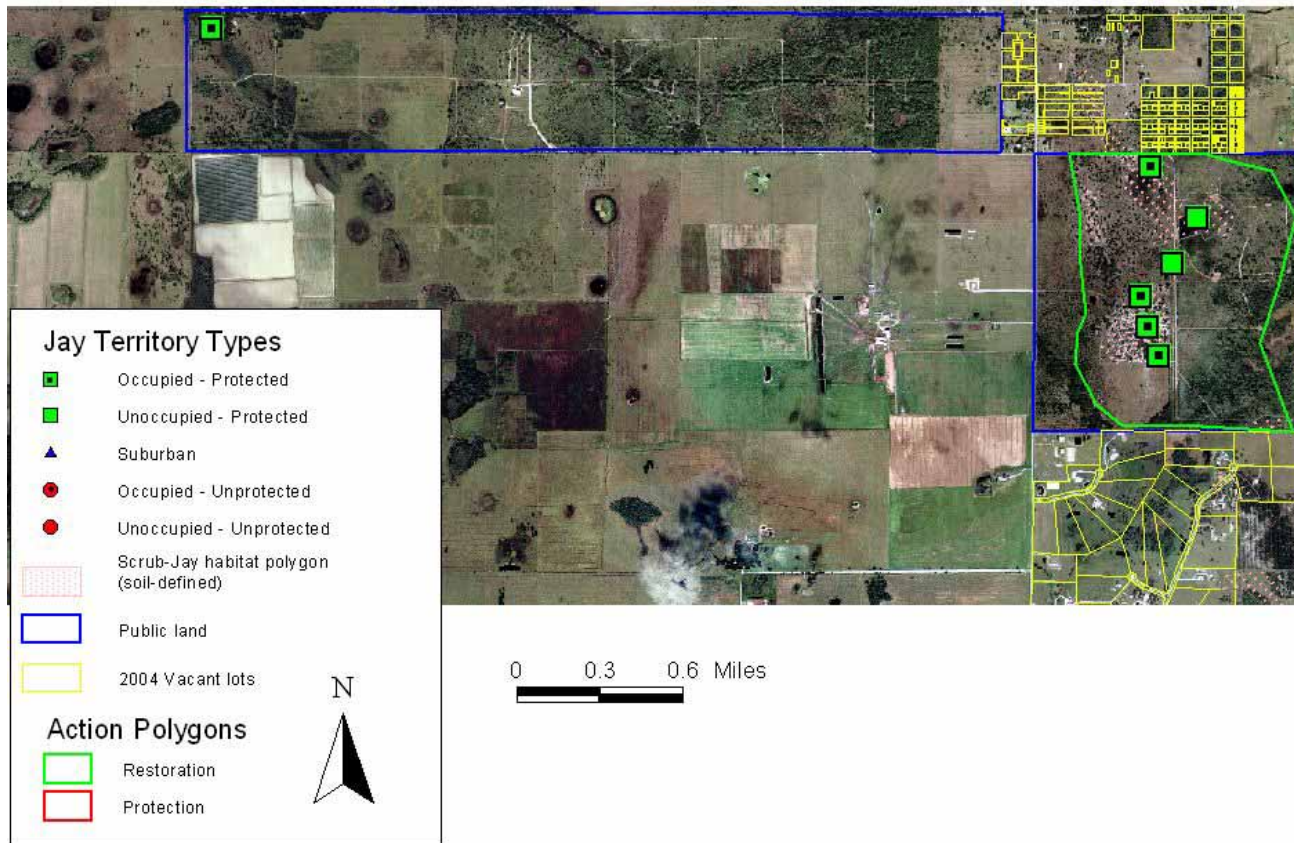


Figure A3-6. Verna Well Field. Green polygon shows public land containing potentially suitable habitat in need of restoration.

Whidden and Jomar Scrub

General description: This site is in the northeast corner of Sarasota County (see Fig. A3-4.1). It is entirely private-owned. One area of potential habitat is within the privately-owned Crowley Nature Preserve. Unprotected habitat just to the north is somewhat disturbed and apparently intended for development. Jays on this site are within easy dispersal distance of the Verna Well Field site population to the north, and to jays in neighboring Manatee County to the east and north (Fig. A3-4.1).

Protected areas: No jays within this area currently are protected. The privately-owned Crowley Nature Preserve has potential habitat that could support at least one territory, but this long-unburned scrub is in hammock-like condition and currently is unoccupied.

Protection potential: At least 2 jay groups recently existed in unprotected habitat north of Crowley Nature Preserve (Fig. A3-7). In total, the unprotected jay habitat in this area Modest Action could support at least 6 territories. Additional unprotected habitat and jay groups occur immediately east of this area in Manatee County (see Fig. A3-4.1).

Simulation Results: Viability of this small population depends very heavily on the fate of Manatee County populations. All scenarios that excluded jays in adjacent Manatee County, even the “Highly Optimistic” scenario, show high extinction risk (Table A3-6) and low mean population trajectories. Adding Manatee County jays (Fig. A3-1) to the simulations changes the results substantially. The Highly Optimistic scenario extinction risk decreases from 0.55 to 0.36, and mean population trajectory increases from 3.47 to 4.83.

Recommendations: Because no jays are currently protected in this area, habitat protection, followed by restoration, are of utmost priority. The viability of this population will be strongly affected by efforts to protect and restore jay habitat in nearby Manatee County. Sarasota County should seriously consider protecting and restoring habitat in nearby Manatee County.

Whidden and Jomar Scrub existing pairs (2004) and potential territories

	Occupied 2004	Total Potential
Protected	0	1
Unprotected	2	6
Total	2	7

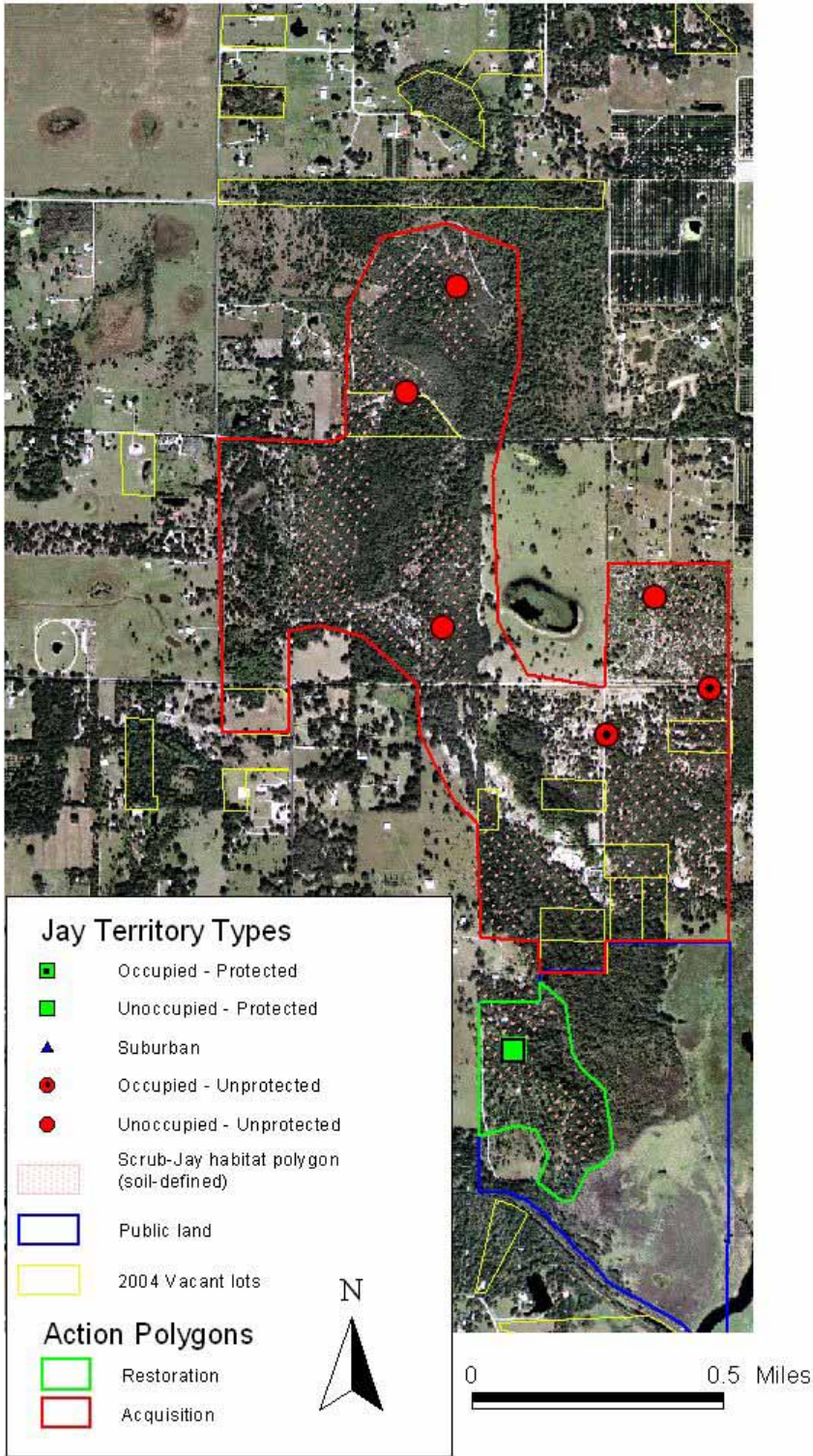


Figure A3-7. Whidden and Jomar (including Crowley Museum & Nature Center). Red polygon shows area that should be prioritized for protection and restoration; green polygon shows protected area needing restoration.

Myakka River State Park

General description: This protected site is on the north side of Lake Myakka in the northwest corner of the Myakka River State Park (see Fig. A3-4.1). A city-owned spray field is adjacent to the west side of the State Park. Jays in this population are within easy dispersal distance of the Whidden/Jomar and Verna Well Field population to the north, and of jays in neighboring Manatee County to the east and north (Fig. A3-4.1).

Protected areas: Jays have been nearly, perhaps completely extirpated from the State Park since the 2000 survey. The western portion of this patch has the potential for 5 – 6 territories. The eastern portion may be capable of supporting another territory. Jays have been seen in the City spray field, which is semi-improved pasture that has restoration potential and could support up to 3 territories.

Protection potential: No new areas of high priority for additional protection were identified.

Simulation Results: All scenarios considering Sarasota County alone and excluding translocation show very high extinction risk (Table A3-8), since these simulations start with only one occupied territory. Both simulations involving translocation have substantially lower extinction risk. Management Plus, Aggressive Action, and Highly Optimistic simulations show favorable mean ending population sizes. Adding Manatee County jays (Fig. A3-1) produced little change to the simulations results.

Recommendations: This population is perilously small and Modest Action has poor connectivity with other jay populations except for the small populations to the north. Possible causes of the decline of this population should be investigated. Jays may have moved to nearby suburban or open/ranch areas. If habitat conditions remain favorable through active fire management, this area would be a very good target for translocating suburban jays. The feasibility of restoring habitat in the City spray field also should be investigated.

Myakka River State Park existing pairs (2004) and potential territories

	Occupied 2004	Total Potential
Public-owned	1	7
Privately-owned	0	3
Total	1	10

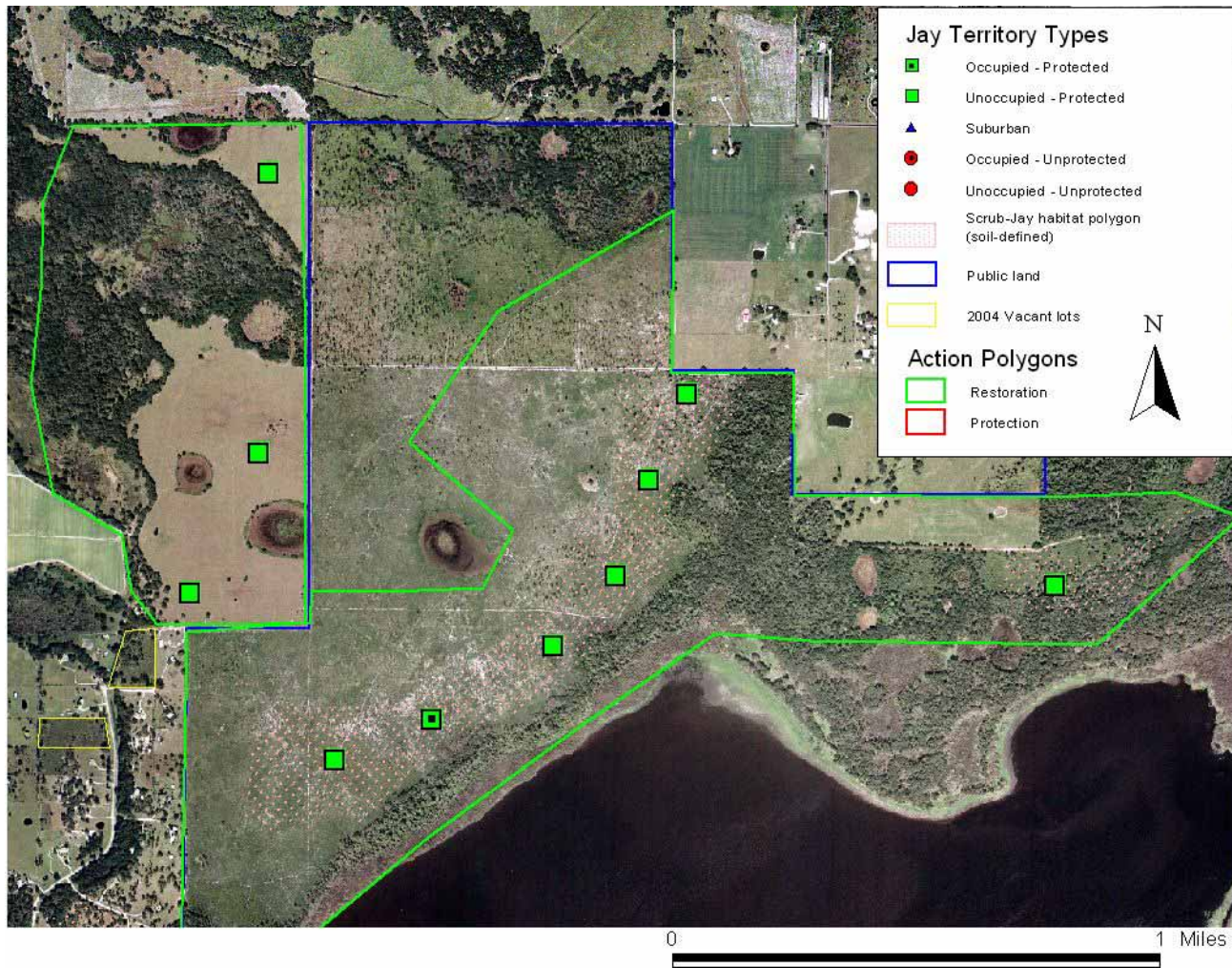


Figure A3-8. Myakka River State Park (northwest corner). Green polygons show public land needing restoration.

Fruitville and Utopia Scrub

General description: This site is northwest of Myakka River State Park (see Fig. A3-4.1). It is entirely private-owned. No survey results are available for this private property, but favorable soils and habitat Modest Action are present. This area is within dispersal distance of the Myakka River State Park, Whidden/Jomar and Verna Well Field population.

Protected areas: This area is entirely privately owned.

Protection potential: The interior of this ranchland has not been surveyed for jays, but has soil polygons and aerial photo signatures strongly indicating that some jay habitat is present. The northwest and southeast sections of this property appear to have the highest potential for jays, and might potentially support at least 4 territories. If this is true, then collaboration with the private owners of this ranch could play an important role in protecting jay habitat in this area.

Simulation Results: All scenarios run with Sarasota County alone show very high extinction risk (Table A3-9), and all show unfavorable mean ending population sizes. Adding Manatee County jays (Fig. A3-1) produced little change to the simulations results.

Recommendations: This area is small and fairly isolated from other areas, but a proper survey is needed to properly evaluate the potential for jays.

Fruitville and Utopia scrub existing pairs (2004) and potential territories

	Occupied 2004	Total Potential
Privately-owned	Unknown	4
Total	Unknown	4

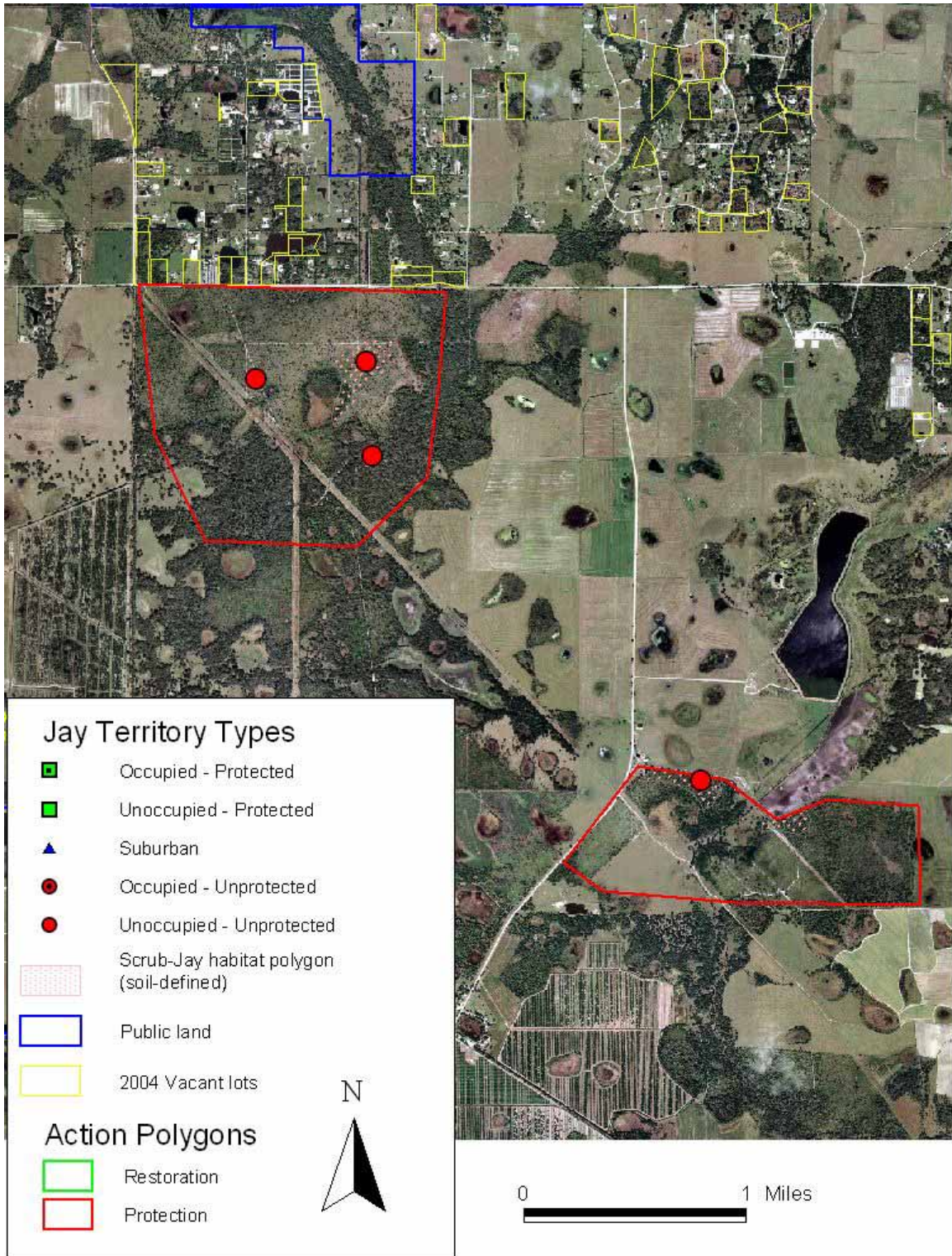


Figure A3-9. Fruitville and Utopia Scrub. Both red polygons show areas that should be prioritized for protection.

Bayonne (Sarasota Square)

General description: This site is located in the Central region, northwest of Oscar Scherer State Park (see Fig. A3-4.2). A portion of this area is county-owned, but the majority is private-owned. Jays appear to have been extirpated from this area, but if re-established, territories would be within dispersal distance of Oscar Scherer SP.

Protected areas: The northern section of this locality is currently protected and has enough habitat to support one family. One jay group was found here in the 2000 census, but jays may now be extirpated. The habitat is extremely overgrown, but was once optimal scrub habitat for jays, and could return to that state with proper restoration.

Protection potential: The southern section of this locality is privately owned, and could potentially support about 3 territories. The habitat is extremely overgrown, and the surrounding landscape is becoming increasingly suburbanized

Simulation Results: All scenarios run with Sarasota County alone show very high extinction risk (Table A3-10). However, mean ending population sizes are surprisingly high for the Modest Action, Aggressive Action, and Highly Optimistic scenarios. This result reflects the influence of nearby Oscar Scherer State Park, which provides immigrants to this locality.

Recommendations: This area is small and somewhat isolated, but its proximity to the large Oscar Scherer population suggests that it functions as a satellite population, with occasional immigrants giving it higher than expected viability. By itself, the site is not viable, but as this is the northernmost area in the Central region and has optimal habitat signatures, it should be protected and restored. This little site can help play a role in maximizing the viability of the Oscar Scherer population.

Bayonne (Sarasota Square) Scrub existing pairs (2004) and potential territories

	Occupied 2004	Total Potential
Public-owned	0	1
Privately-owned	0	3
Total	0	4

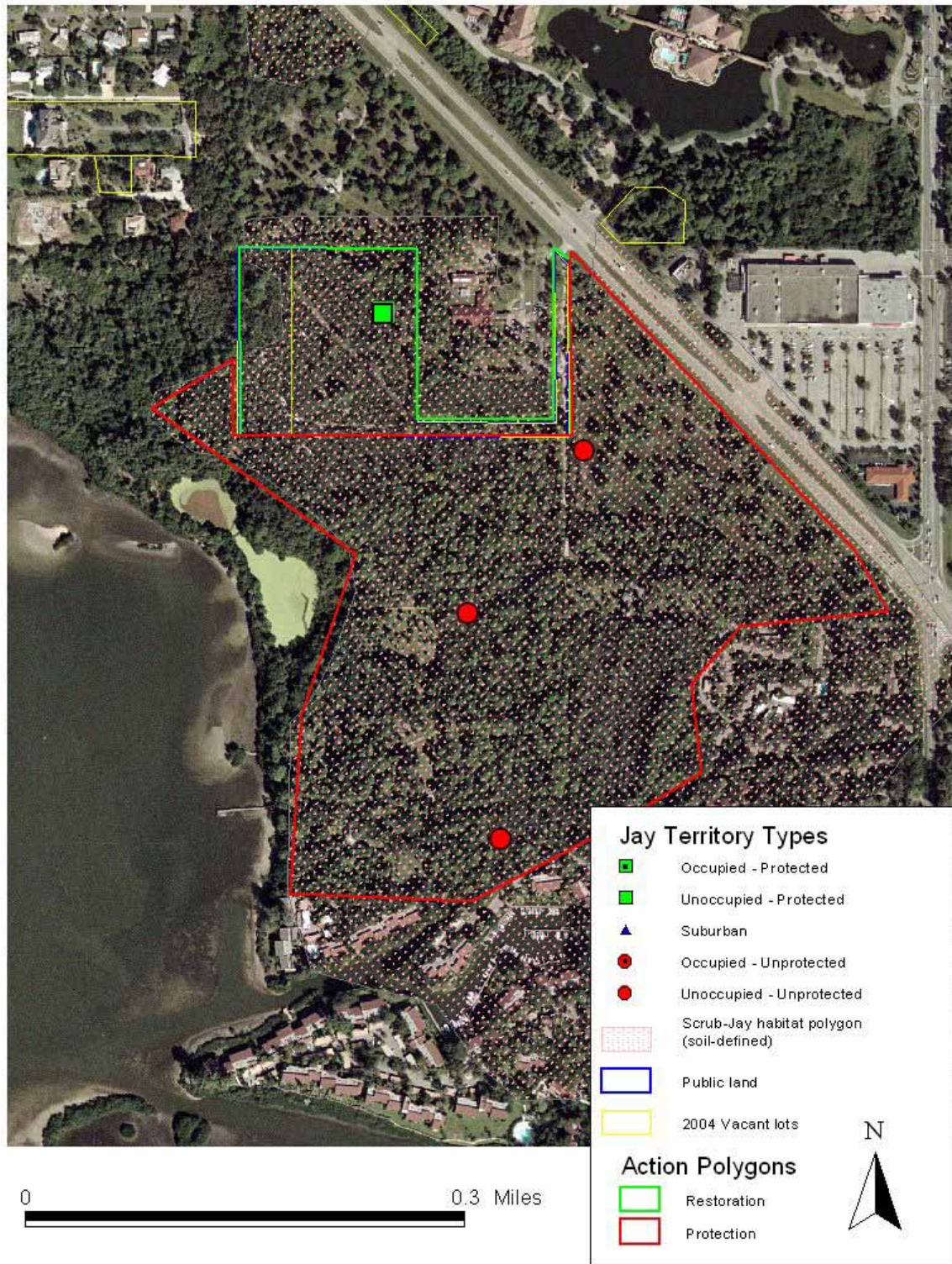


Figure A3-10. Bayonne (Sarasota Square). Red polygon to south shows area that should be prioritized for protection; green polygon shows public land needing restoration.

Little Sarasota Bay

General description: This locality is northwest of Oscar Scherer State Park in the Central Region and is entirely private-owned (see Fig. A3-4.2). Most of the habitat in the Little Sarasota Bay area has been developed, and perhaps only one territory exists in an unprotected area that is not fully developed. Jays at this site are within dispersal distance of Oscar Scherer SP to the south.

Protected areas: Scrub habitat is currently being protected and managed within the recommended protection area by the Oaks Subdivision .

Protection potential: One family was present in this area in 2004 in addition to a single jay found on the Stoneybrook Golf Course. Sufficient habitat may exist for up to 2 territories, but the surrounding landscape is increasingly suburbanized.

Simulation Results: All scenarios run with Sarasota County alone show very high extinction risk (Table A3-11). However, mean ending population sizes are surprisingly high for the Modest Action, Aggressive Action, and Highly Optimistic scenarios, reflecting the influence of nearby Oscar Scherer State Park, which provides immigrants to this locality.

Recommendations: This area is small and is embedded within an increasingly suburbanized landscape. Immigrants from nearby Oscar Scherer population may increase the viability of this site, giving it a higher than expected viability. Care should be taken to monitor the management of the protected scrub habitat. Any additional scrub or buffer habitat that can be acquired here will increase the role this little area can play in improving the viability of the nearby Oscar Scherer population.

Little Sarasota Bay existing pairs (2004) and potential territories

	Occupied 2004	Total Potential
Privately-owned	1	2
Total	1	2

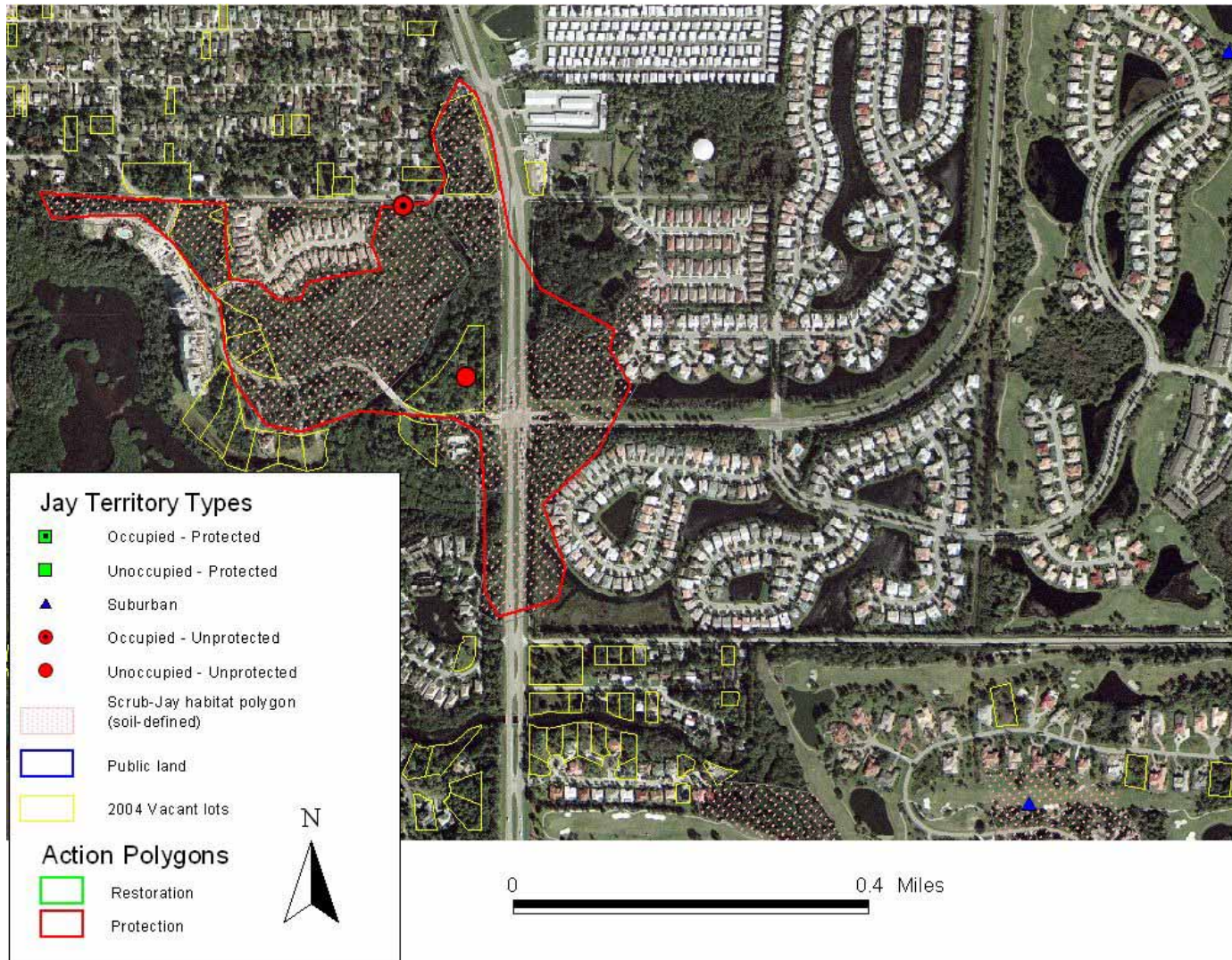


Figure A3-11. Little Sarasota Bay. Red polygon shows area that should be prioritized for protection.

Oscar Scherer State Park

General description: Oscar Scherer State Park is in the Central region and contains the largest protected population of Florida Scrub-Jays on the entire west coast of Florida (see Fig. A3-4.2). This population is within easy dispersal distance of territories at Fox Creek and Knight Trail to the east, as well as Sarasota Square and Little Sarasota Bay to the northwest. Long-term monitoring at Oscar Scherer has documented immigrants banded in the Venice suburbs, well to the South.

Protected areas: Oscar Scherer has enough habitat to support 24 – 28 jay groups, but is currently supporting 21 territories. The habitat is well managed, but the northern portion of the Park perhaps could support additional jays if scrub oaks were transplanted into this area. The landscape western edge of the park is becoming increasingly developed.

Protection potential: Habitat to the north and west of the Park has been developed. Protection and management of the wetland and prairie habitat to the east would provide an important buffer the Park and would help maintain connectivity with jays in the Fox Creek and Knight Trail area.

Simulation Results: All scenarios run with Sarasota County alone show low extinction risk, but quasi-extinction risk is high, especially for the Status Quo scenario (Table A3-12).

Recommendations: Aggressive management should be continued to provide as much optimal habitat for jays as possible. Evidence of poor demographic performance suggests that Oscar Scherer currently may be functioning as a pseudo-sink, attracting excessive numbers of immigrants from nearby areas, which in turn actually reduce overall reproductive success of the jays in the preserve.

Oscar Scherer State Park existing pairs (2004) and potential territories

	Occupied 2004	Total Potential
Public-owned	21	28
Total	21	28

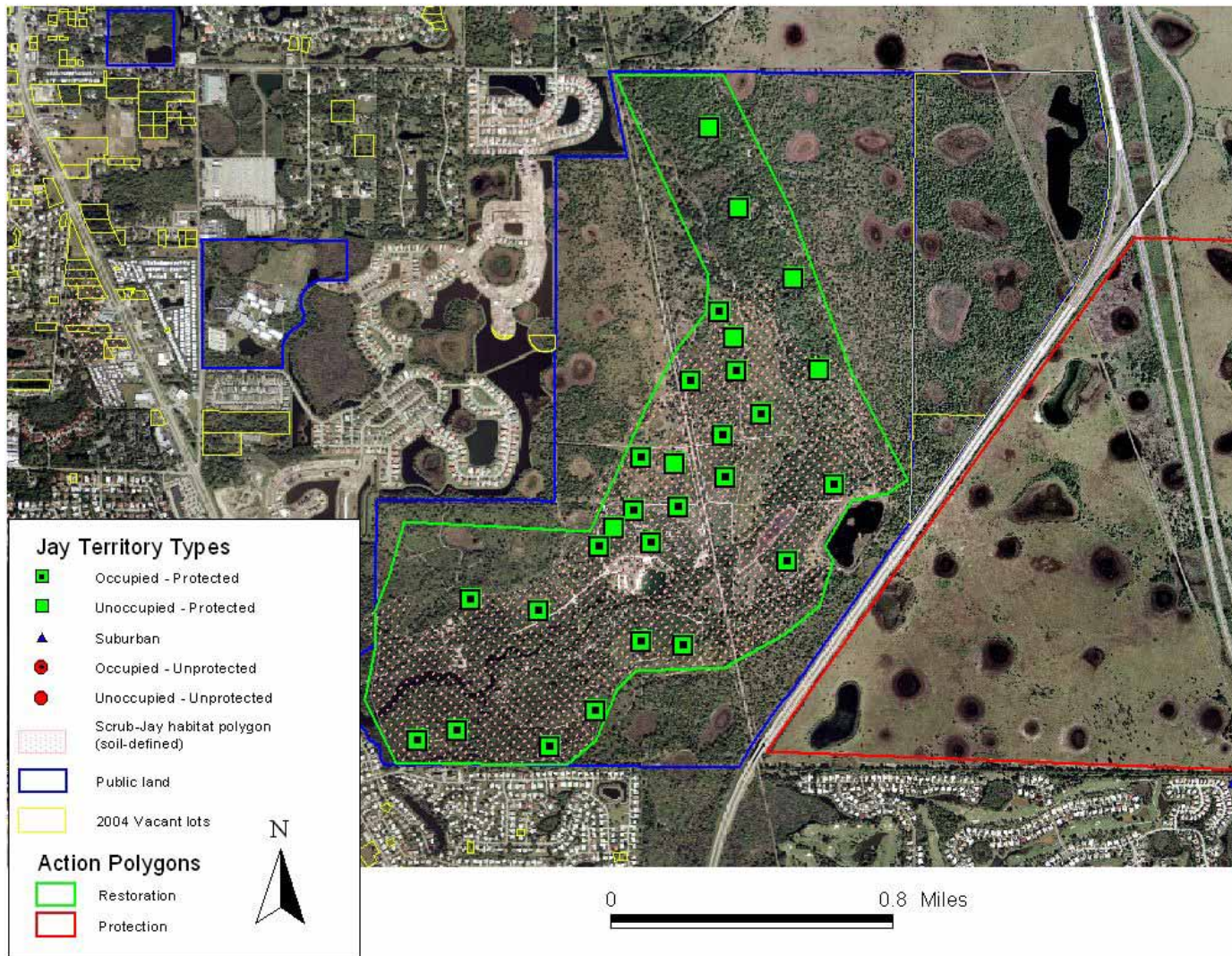


Figure A3-12. Oscar Scherer State Park. Green polygon shows public land needing restoration; red polygon to east shows area that should be prioritized for protection as a buffer.

Table A3-12. Oscar Scherer State Park Patch Population Simulation Statistics

Acquisition Restoration Translocation	None None None	None Intense None	None Intense Intense	Moderate Moderate None	High Intense None	Maximum Intense Intense
	“Status Quo”	“Good Mgmt”	“Mgmt Plus”	“Modest Action”	“Aggressive Action”	“Highly Optimistic”
Starting “native” population size	21	21	28	21	21	28
Potential “native” population size	21	28	28	24	28	28
Starting “suburban” population size	0	0	0	0	0	0
mean end pop. size standard deviation	15.19 - 15.17 6.40 - 6.63	22.66 - 24.56 7.38 - 5.36	24.84 - 24.95 5.02 - 5.57	19.70 - 20.76 6.19 - 4.74	25.01 - 25.34 4.61 - 5.10	24.40 - 26.05 5.93 - 3.24
Extinction Risk	0.05 - 0.13	0.05 - 0.01	0.03 - 0.01	0.07 - 0.02	0.01 - 0	0.01 - 0
Quasi-extinction Risk (10 pairs)	0.67 - 0.66	0.28 - 0.31	0.16 - 0.19	0.33 - 0.38	0.19 - 0.13	0.19 - 0.09

Fox Creek

General description: This site is in the Central region (see Fig. A3-4.2), and is close to I-75. A portion of this area is county-owned, but the majority is private-owned and experiencing rapid suburbanization. This population is within easy dispersal distance of the Knight Trail and Pinelands Reserve to the east, and to Oscar Scherer State Park to the northwest.

Protected areas: Protected jay habitat in the southern parcel of this area could support at least 3 territories (see Fig. A3-13). Additionally, a 200-acre mitigation preserve to the north could support at least 2 territories. Currently, no jays occupy either of these protected areas. Aggressive restoration is needed to provide more optimal habitat for jays.

Protection potential: At least 2 banded jay families are known to occupy unprotected habitat just north of the protected parcel, and an additional territory could be added through restoration (although recent residential development may have reduced opportunities here). Two suburban territories are present at the golf course community just west of the area. Additional habitat just south of the protected parcel might support an additional territory. Habitat is not ideal in this area (soils are slightly mesic) but oaks are present, and with periodic burning or clearing the potential for continuous occupancy by jays is good.

Simulation Results: All scenarios run with Sarasota County alone show high extinction risk except for the Aggressive and Highly Optimistic scenario (Table A3-13). However, the mean population size shows a fairly stable trajectory for all scenarios except for Status Quo. Immigration from Oscar Scherer may be important for this population.

Recommendations: Aggressive management is needed to encourage jays to reestablish in the protected portion of this area. Protection of habitat currently occupied by jays just north of the protected area should be a high priority. Additionally, habitat just south of the protected area should be protected and restored.

Fox Creek existing pairs (2004) and potential territories

	Occupied 2004	Total Potential
Public-owned	0	3
Privately-owned	2	4
Total	2	7