Table 1. Florida panther habitat preferences (1) appearing in Maehr and Cox (1995), (2) as estimated by C. Morea (unpublished data) using National Gap Analysis Program 1993-94 land cover data (Pearlstine *et al.* 2000) and panther telemetry data buffered by 120 m (*i.e.,* telemetry points located to nearest 100 m on 1:24,000-scale topographic maps), and (3) as coded by airborne observers in the process of collecting telemetry locations.

		Maehr and Cox (1995)[a]	C. Morea (unpublished)[b]	Telemetry Habitat Codes[c]
Land Use	Cover Type	Percent of Points	Percent of Area <120 m	Percent of Points
Forest	Hardwood forest	23.2	0.3	32.5
	Cypress swamp	31.8	14.9	11.7
	Mixed swamp	17.4	29.8	15.2
	Pine flatwoods	7.3	13.0	24.6
	Pine/cabbage palm			5.9
	Cabbage palm hammock			3.4
	Tropical hammock		5.6	
	Mixed hardwood-pine forest	0.7		
	Xeric oak scrub		0.1	0.0
	Sandhill		0.0	
	Sand pine scrub		0.0	
	Subtotal	80.4	63.8	93.3
Freshwater marsh	Freshwater marsh	5.8	22.9	0.9
	Open cypress swamp			0.2
	Subtotal	5.8	22.9	1.1
Prairie and shrub lands	Dry prairie	3.3	0.1	0.3
	Shrub swamp	2.8	4.2	1.6
	Shrub and brush	0.8	0.0	
	Cabbage palm prairie			0.0
	Subtotal	6.9	4.4	1.8
Agriculture	Pasture/grass/agriculture	4.5	2.9	
	Agriculture/disturbed			3.8
	Agriculture		2.0	
	Orchards/groves			
	Row crops			
	Subtotal	4.5	4.9	3.8

Table 1 (cont.). Florida panther habitat preferences (1) appearing in Maehr and Cox (1995), (2) as estimated by C. Morea (unpublished data) using National Gap Analysis Program 1993-94 land cover data (Pearlstine *et al*. 2000) and panther telemetry data buffered by 120 m (*i.e*., telemetry points located to nearest 100 m on 1:24,000-scale topographic maps), and (3) as coded by airborne observers in the process of collecting telemetry locations.

		Maehr and Cox (1995)[a]	C. Morea (unpublished)[b]	Telemetry Habitat Codes[c]
Land Use	Cover Type	Percent of Points	Percent of Area <120 m	Percent of Points
Urban, barren and exotics	Urban	1.4	0.3	
	Barren		0.4	
	Exotics	0.1	2.5	0.0
	Subtotal	1.5	3.2	0.0
Coastal wetlands	Mangroves	0.0	0.3	0.0
	Salt marsh	0.7	0.0	
	Subtotal	0.7	0.3	0.0
Aquatic and clouds	Water	0.0	0.3	
	Cloud	0.0	0.1	
	Subtotal	0.0	0.4	

[a] 14,509 telemetry points for 23 panthers collected 12/85-12/90 overlaid on FWC 1985-89 Landsat-based land cover data (Kautz *et al.* 1993).

[b] 49,440 telemetry locations collected 2/22/81-12/31/99 were converted to a 30 m grid. Each pixel representing one or more telemetry locations was buffered by 120 m and overlaid on 1993-94 land cover data (Pearlstine *et al.* 2000). Area of each land cover type within the 120 m buffer was tabulated.

[c] Habitat codes entered by observers into the radio-telemetry database. Of 51,861 locations collected 2/22/81-6/30/00, only 38,393 records Contained habitat information.

Table 2. Florida panther habitat use determined by overlaying 55,542 telemetry points collected 2/22/81-3/30/01 on the WMD 1995 land use/land cover data set. Columns are percentage of points falling on a single pixel of a specific land cover type (*i.e.*, point-to-pixel), and percentage of the area of each cover type found within 230 m (*i.e.*, estimated positional error) of each point using both contiguous and non-contiguous buffer polygons.

Land Use	Cover Type	Point-to-Pixel Percent of Points	Percent of Area <230 m of Points (Contiguous)	Percent of Area <230 m of Points (Non-contiguous)
Forest	Cypress - gum swamp	30.7	33.5	30.4
	Mixed hardwood swamp	26.2	18.9	25.1
	Pine flatwoods	15.2	11.1	14.4
	Hardwood forest	5.3	3.0	5.0
	Tropical hardwood hammock	1.0	0.3	1.1
	Bay swamp	0.1	0.1	0.1
	Cabbage palm hammock	0.0	0.0	0.1
	Pine plantations	0.0	0.1	0.0
	Longleaf pine - xeric oak	0.0	0.0	0.0
	Sand pine scrub	0.0	0.0	0.0
	Pine forest	0.0	0.0	0.0
	Xeric oaks	0.0	0.0	0.0
	Subtotal	78.5	67.1	76.3
Freshwater marsh	Freshwater marsh	11.6	20.2	13.5
	Aquatic bed (floating leaved aquatics)	0.0	0.0	0.1
	Subtotal	11.6	20.2	13.6
Prairie and shrub lands	Unimproved and woodland pasture	2.5	2.6	2.3
	Palmetto prairies	1.2	1.3	1.1
	Herbaceous rangeland	0.1	0.1	0.1
	Shrub and brush	0.0	0.0	0.0
	Subtotal	3.8	4.0	3.5
Agriculture	Improved pasture	1.5	2.7	1.7
	Agriculture, crops and special	1.0	1.9	1.3
	Citrus groves	0.4	0.8	0.5
	Agriculture, tree crops	0.0	0.1	0.0
	Sod farms	0.0	0.0	0.0
	Subtotal	3.0	5.5	3.5

Table 2 (cont.). Florida panther habitat use determined by overlaying 55,542 telemetry points collected 2/22/81-3/30/01 on the WMD 1995 land use/land cover data set. Columns are percentage of points falling on a single pixel of a specific land cover type (*i.e.*, point-to-pixel), and percentage of the area of each cover type found within 230 m (*i.e.*, estimated positional error) of each point using both contiguous and non-contiguous buffer polygons.

Land Use	Cover Type	Point-to-Pixel Percent of Points	Percent of Area <230 m of Points (Contiguous)	Percent of Area <230 m of Points (Non-contiguous)
Barren, urban and exotics	Exotics	2.2	1.6	2.2
	Barren land	0.2	0.2	0.2
	Transportation	0.1	0.2	0.2
	Urban, residential and commercial	0.1	0.1	0.1
	Utilities	0.0	0.1	0.0
	Urban, industrial	0.0	0.0	0.0
	Urban, institutional	0.0	0.0	0.0
	Recreational	0.0	0.0	0.0
	Urban, open land	0.0	0.0	0.0
	Mining	0.0	0.0	0.0
	Coastal scrub	0.0	0.0	0.0
	Sand	0.0	0.0	0.0
	Subtotal	2.7	2.4	2.8
Coastal wetlands	Mangrove swamp	0.2	0.3	0.2
	Salt marsh	0.0	0.1	0.0
	Non-vegetated wetlands	0.1	0.2	0.1
	Subtotal	0.3	0.6	0.3
Aquatic	Water	0.1	0.2	0.1
	Submerged aquatic vegetation	0.0	0.0	0.0
	Subtotal	0.1	0.2	0.1

Table 3. Florida panther habitat use determined by overlaying 55,542 telemetry points collected 2/22/81-3/30/01 on the FWC Landsat-based land cover data set updated to 1995-96. Columns are percentage of points falling on a single pixel of a specific land cover type (*i.e.*, point-to-pixel), and percentage of the area of each cover type found within 230 m (*i.e.*, estimated positional error) of each point using both contiguous and non-contiguous buffer polygons.

Land Use	Cover Type	Point-to-Pixel Percent of Points	Percent of Area <230 m of Points (Contiguous)	Percent of Area <230 m of Points (Non-contiguous)
Forest	Cypress swamp	27.3	28.2	27.0
	Hardwood forest	22.0	14.6	21.3
	Hardwood swamp	11.8	7.3	11.3
	Pinelands	8.7	6.9	8.7
	Mixed hardwood-pine forest	0.5	0.5	0.4
	Bay swamp	0.2	0.2	0.1
	Xeric oak scrub	0.1	0.1	0.0
	Sandhill	0.0	0.0	0.0
	Sand pine scrub	0.0	0.0	0.0
	Subtotal	70.6	57.9	68.9
Freshwater marsh	Freshwater marsh	14.0	22.7	15.6
Prairie and shrub lands	Dry prairie	2.2	2.3	2.0
	Shrub swamp	1.9	2.4	1.8
	Shrub and brush	0.8	1.2	0.7
	Subtotal	4.9	5.9	4.5
Agriculture	Grassland and pasture	7.1	7.7	7.1
	Row crops	0.6	1.4	0.9
	Orchards/groves/vineyards	0.4	0.7	0.5
	Subtotal	8.1	9.8	8.4
Urban, barren and exotics	Barren	1.4	1.8	1.5
	Exotics	0.3	0.5	0.3
	Urban	0.2	0.3	0.2
	Subtotal	1.9	2.6	2.0
Coastal wetlands	Salt marsh	0.3	0.6	0.3
	Mangrove swamp	0.1	0.3	0.1
	Subtotal	0.4	0.9	0.4
Aquatic	Water	0.1	0.2	0.1

Table 4. Florida panther habitat preferences as determined by two compositional analyses. The analyses used 46,685 telemetry locations for 81 panthers which were all >2 years old and for which >50 telemetry locations were available. Telemetry data were used to generate both minimum convex polygon and fixed kernel home ranges that were subjected to compositional analyses. The FWC satellite-based land cover data set updated to 1995-96 was used as the source of land cover data. The original data contained 25 land cover classes that were lumped into 15 cover types to overcome limitations of the software's ability to process so much data.

Habitat Type	Minimum Convex Polygon Rank	Minimum Convex Polygon Similarities	Fixed Kernel Polygon Rank	Fixed Kernel Polygon Similarities
Upland hardwood forest	1	A	1	A
Cypress swamp	2	BC	2	B
Freshwater marsh	3	BC	4	B
Pine forest	4	C	3	BC
Hardwood swamp	5	CD	5	BC
Barren land	6	D	6	C
Pasture/grassland	7	E	7	D
Mixed hardwood-pine forest	8	F	8	E
Dry prairie	9	F	9	E
Shrub and brush	10	F	10	EF
Shrub swamp	11	FG	11	F
Crop land	12	GH	12	G
Orchards/citrus groves	13	H	13	GH
Exotic plants	14	I	14	H
Coastal wetlands	15	J	15	I

Table 5. Area of forest lost to development in a 10-county region of South Florida between 1936 and 1995.

County	1936 Hectares	1949 Hectares	1959 Hectares	1970 Hectares	1980 Hectares	1987 Hectares	1995 Hectares	Total Loss Hectares	Percent Decline	Rate %/yr
Collier		389,514	370,243		301,077	301,964	243,990	145,524	37	0.81
Lee		187,328	122,794		69,247	73,294	48,062	139,266	74	1.62
Charlotte		144,575	113,077		45,166	21,950	20,513	124,062	86	1.87
Hendry		118,583	123,684		48,656	38,171	28,998	89,585	76	1.64
Monroe		100,283	106,761		150,846	170,297	147,736	-47,453	-47	-1.03
Martin		93,441	76,275		22,123	15,341	20,823	72,618	78	1.69
Palm Beach		90,486	122,186		53,346	33,478	49,563	40,923	45	0.98
Dade		87,530	112,510		85,004	97,383	65,036	22,494	26	0.56
Glades		84,858	62,632		40,371	36,919	41,849	43,009	51	1.10
Broward		45,101	35,182		13,147	14,440	8,543	36,558	81	1.76
Total	1,425,101	1,341,700	1,245,344	904,649	828,984	803,238	675,115	749,986	53	0.89

Table 6. Estimated increase in area of disturbed lands in five southwest Florida counties 1986-1996. Change was estimated by classifying 1996 Landsat Thematic Mapper imagery to isolate disturbed lands, labeling disturbed land use classes using ancillary land use/land cover databases, overlaying 1996 disturbed lands on a 1986 land cover database (Kautz *et al.* 1993), and tabulating land cover changes between the two dates.

County	1996 Disturbed Area (ha)	Area Disturbed 1986-96 (ha)	Percent Increase in Disturbed Area
Hendry	208,376	39,087	23.1
Lee	114,943	23,542	25.8
Collier	91,287	25,434	38.6
Charlotte	70,160	16,385	30.5
Glades	107,052	36,790	52.4
Total	591,818	141,238	31.3
Land Use			
Agriculture	407,329	84,589	26.2
Urban	148,645	42,733	40.3
Undetermined	35,844	13,917	63.5
Total	591,818	141,238	31.3

Table 7. Estimated area of cover types (Kautz *et al.* 1993) converted to urban, agricultural, and undetermined (*i.e.*, either urban or agricultural) uses between 1986-1996.

Cover Type	Conversion to Urban Use (ha)	Conversion to Agricultural Use (ha)	Conversion to Undetermined Use (ha)	Total Conversions (ha)	Conversion Percentage
Pinelands	14,052	15,380	5,233	34,665	24.5
Hardwood forest	2,200	6,809	1,176	10,184	7.2
Mixed hardwood-pine forest	732	3,264	198	4,194	3.0
Tropical hardwood hammock	217	30	34	282	0.2
Xeric oak scrub	179	0	13	192	0.1
Cypress swamp	2,979	6,622	577	10,178	7.2
Hardwood swamp	134	80	26	240	0.2
Forest Total	20,493	32,185	7,256	59,934	42.4
Freshwater marsh	2,562	9,702	954	13,218	9.4
Dry prairie	6,966	41,120	3,462	51,547	36.5
Shrub and brush	9,181	0	1,763	10,943	7.7
Shrub swamp	95	991	77	1,162	0.8
Mangrove swamp	400	3	71	474	0.3
Salt marsh	819	17	79	915	0.6
Coastal strand	39	0	6	45	0.0
Grassland/agriculture	-	0	5	5	0.0
Urban/barren	-	0	3	3	0.0
Exotics	271	49	49	368	0.3
Water	1,908	521	193	2,623	1.9
Total Area	42,733	84,589	13,917	141,238	100

Table 8. Estimated changes in cover types mapped as potential habitat by Cox *et al.* (1994) in Lee, Hendry, and Collier Counties 1986-1996. Estimates derive from overlaying the potential habitat map, originally created with 1986 land cover data, on both the 1986 and 1996 land cover data sets and tabulating the differences.

Potential Habitat Cover Type	1986 Area (ha)	1996 Area (ha)	Increase or Decrease in Area (ha)	% Change
Natural[a]	349,919	321,298	-28,621	-8.2
Agriculture[b]	86,144	107,956	21,813	25.3
Urban/Barren	12,342	19,584	7,243	58.7
Water	554	302	-252	-45.4
Miscellaneous[c]	958	775	-183	-19.1

[a]Forest, freshwater marsh, dry prairie, shrub swamp

[b]Grassland/agriculture, shrub and brush

[c]Coastal strand, salt marsh, mangrove, exotics

Table 9. Florida population growth 1970-2000 and medium population projections for 10 South Florida counties through 2030 (Smith and Nogle 2001).

County	1970 Census	1980 Census	1990 Census	2000 Census	2010 Projection	2020 Projection	2030 Projection	Percent Increase 2000-2030
Miami-Dade	1,267,792	1,625,979	1,937,194	2,253,362	2,557,100	2,870,600	3,164,300	40
Broward	620,100	1,014,043	1,255,531	1,623,018	1,949,400	2,289,900	2,612,700	61
Palm Beach	348,993	573,125	863,503	1,131,184	1,375,200	1,630,100	1,872,400	66
Lee	105,216	205,266	335,113	440,888	539,300	642,200	740,100	68
Collier	38,040	85,791	152,099	251,377	343,500	441,600	536,900	114
Charlotte	27,559	59,115	110,975	141,627	171,600	202,400	231,500	63
Martin	28,035	64,014	100,900	126,731	151,500	176,800	200,600	58
Monroe	52,586	63,098	78,024	79,589	81,100	82,600	84,000	6
Hendry	11,859	18,599	25,773	36,210	45,800	55,500	64,900	79
Glades	3,669	5,992	7,591	10,576	12,800	15,000	17,000	61
Total	2,503,849	3,715,022	4,866,703	6,094,562	7,227,300	8,406,700	9,524,400	56

Table 10. Public conservation lands within the Primary Habitat Zone (see Chapter 3 for definition) greater than 10,000 acres.

Area	Agency	Size (acres x 1000)	Est. # of Panthers*	Visitor Access	ORV Use	# of days Hunting**	Non-native Management	Fire Management
Big Cypress National Preserve	USNPS	729	32	open	quota	99	yes	yes
Everglades National Park	USNPS	554***	7	open	no	0	yes	yes
Florida Panther National NWR	USFWS	26.4	7	closed	no	0	yes	yes
Fakahatchee Strand State Preserve	FDEP	73.4	3	open	no	0	yes	yes
Okaloacoochee Slough State Forest	FDOF	35	interim	open	no	35	yes	yes
Picayune Strand State Preserve	FDOF	52	3	open	no	27	yes	yes

Corkscrew Regional Ecosystem Watershed	SFWMD	26	2	open	no	18	yes	yes
Corkscrew Swamp Sanctuary	NAS	10.5	interim	limited	no	0	yes	yes

* as of 5/01

** deer and hog hunting

*** excluding water

Table 11. Cumulative percentage of 55,542 Florida panther radio-telemetry locations collected 2/22/81-3/30/01 in 100 m increments from patches of forest and urban land cover based on Water Management District (WMD) 1995 land use/land cover data and Florida Fish and Wildlife Conservation Commission (FWC) Landsat-based land cover data updated to 1995-96. 95% of all telemetry locations are within about 160-200 m of a forest patch and further than about 275-750 m from urban patches.

	Forest		Urban	
Distance (m)	WMD Cumulative Percent	FWC Cumulative Percent	WMD Cumulative Percent	FWC Cumulative Percent
100	91.6	93.5	0.4	1.4
200	94.9	96.5	0.8	3.5
300	96.4	97.5	1.5	6.3
400	97.4	98.1	2.1	9.0
500	98.0	98.4	2.9	12.0
600	98.4	98.6	3.6	15.0
700	98.8	98.9	4.5	17.7
800	99.1	99.0	5.4	20.3
900	99.3	99.1	6.3	22.8
1000	99.5	99.2	7.4	25.2
>1000	100.0	100.0	100.0	100.0

Table 12. Scores and weights assigned to the three habitat-oriented variables used to model the landscape context of South Florida panther habitats. Model results were used to refine the boundary of the Secondary Zone.

Secondary Zone Context Variable 1	Score	Distance (m)	Increment
Proximity to primary zone	10	In Primary Zone	--
Delphi weight = 23.2%	9	1-1000 m	1000 m
	8	1001-2000 m	1000 m
	7	2001-4000 m	2000 m
	6	4001-6000 m	2000 m
	5	6001-8000 m	2000 m
	4	8001-11,000 m	3000 m
	3	11,001-14,000 m	3000 m
	2	14,001-17,500 m	3500 m
	1	>17,500 m	--

Secondary Zone Context Variable 2	Score	Distance (m)	Increment	Percent of Telemetry Locations
Proximity to patch of potential habitat	10	In habitat patch	--	92.27
Delphi weight = 16.3%	9	0-100 m	100 m	1.80
	8	101-200 m	100 m	1.49
	7	201-400 m	200 m	1.53
	6	401-700 m	300 m	1.27
	5	701-1000 m	300 m	0.60
	4	1001-1500 m	500 m	0.56
	3	1501-2000 m	500 m	0.31
	2	2001-3500 m	1500 m	0.15
	1	>3500 m	--	0.03

Secondary Zone Context Variable 3	Score	Patch Size (ha)
Potential habitat patch size	10	>400 ha
Delphi weight = 16.4%	7	41-400 ha
	5	25-40 ha
	2	3-24 ha
	1	0-2 ha

Table 13. Scores and weights assigned to the three land use-oriented variables used to model the landscape context of South Florida panther habitats. Model results were used to refine the boundary of the Secondary Zone.

Secondary Zone Context Variable 4	Score	Distance (m)	Increment
Proximity to urban lands	10	>1000 m	--
Delphi weight = 13.9%	9	913-1000 m	87.5 m
	8	826-912 m	87.5 m
	7	738-825 m	87.5 m
	6	651-737 m	87.5 m
	5	563-650 m	87.5 m
	4	476-562 m	87.5 m
	3	388-475 m	87.5 m
	2	301-387 m	87.5 m
	1	Urban + 300 m	--

Secondary Zone Context Variable 5	Score	Mean Intensity Unit	Increment	Land Use Intensity
Land use intensity	10	0.00-0.30	0.3	Natural
Delphi weight = 17.9%	9	0.31-0.60	0.3	
	8	0.61-0.90	0.3	
	7	0.91-1.20	0.3	Prairie/range
	6	1.21-1.50	0.3	
	5	1.51-1.80	0.3	
	4	1.81-2.10	0.3	Crop/pasture
	3	2.11-2.40	0.3	
	2	2.41-2.70	0.3	
	1	2.71-3.00	0.3	Urban

Secondary Zone Context Variable 6	Score	Type/Density Units	Number of Telemetry Locations	Cumulative Percent
Type and density of roads	10	0	29,125	52.4
Delphi weight = 12.2%	8	1	8,763	68.2
	7	2	5,745	78.6
	5	3-5	5,556	88.6
	4	6-8	2,542	93.1
	3	9-12	1,414	95.7
	2	13-23	1,986	99.3
	1	>23	411	100.0

Table 14. Habitat suitability scores used in the landscape linkage model. Scores ranged 0-10 with higher scores indicating a greater likelihood of use by dispersing panthers.

Land Cover Type	Score	Land Cover Type	Score	Land Cover Type	Score
Water	0	Shrub swamp	5	Hardwood swamp	9
Urban	1	Shrub and brush	5	Cypress swamp	9
Coastal strand	1	Dry prairie	6	Sand pine scrub	9
Tropical hammock	1	Hardwood-pine forest	6	Sandhill	9
Mangrove swamp	2	Grassland/pasture	7	Pine forest	9
Salt marsh	2	Barren	8	Xeric oak scrub	10
Exotic plants	3	Freshwater marsh	9	Hardwood forest	10
Crop land	4	Bottomland hardwood	9		
Orchards/groves	4	Bay swamp	9		

Table 15. Scores for four data layers that, when combined together, were used to model landscape context. The data layers attempt to characterize the context of habitats in the South Florida landscape with respect to likelihood of use by dispersing panthers.

Variable 1: Diversity of Preferred Cover
Definition: number of preferred cover types (*i.e.*, hardwood hammock, cypress swamp, hardwood swamp) within a 120 m x 120 m window around any given cell.
Weight: 22.0%

Number of Preferred Cover Types	Score
0	0
1	3
2	7
3	10

Variable 2: Habitat Matrix
Definition: dominant of 4 major land use types within a 300 m x 300 m window of any given cell.
Weight: 16.8%

Land Use Type	Score
Urban	0
Water/herbaceous wetland	3
Agriculture/pasture	7
Terrestrial/wetland forest	10

Variable 3: Preferred Cover Patch Size
Definition: size of contiguous patches of preferred cover types.
Weight: 28.6%

Patch Size (ha)	Score
0	0
1-40	1
41-500	5
>500	10

Variable 4: Proximity to Patches of Preferred Cover
Definition: distance to patches of preferred cover types.
Weight: 32.6%

Distance (m)	Score
>1000	0
901-1000	1
801-900	2
701-800	3
601-700	4
501-600	5
401-500	6
301-400	7
201-400	8
101-200	9
0-100	10

Table 16. Scores assigned to the South Florida landscape based on proximity to large (>40 ha) urban areas. Proximity to large urban areas was one of several data layers used to model the least cost paths likely to be used by panthers dispersing out of South Florida.

Proximity to Urban Lands (m)	Score
0-300	0
301–378	1
379-455	2
456-534	3
535-611	4
612-689	5
690-767	6
768-845	7
846-922	8
923-1000	9
>1000	10

Table 17. Recommendations for widths of wildlife corridors.

Basis of Corridor Width	Home Range (km^2)	Corridor Length (km)	Suggested Corridor Width (km)	Basis for Suggested Width	Source
Transient male (Florida)	623	--	17.6	1:2	Harrison (1992)
Adult male (Florida)	519	--	16.0	1:2	Harrison (1992)
Adult female (Florida)	193	--	9.8	1:2	Harrison (1992)
Transient male (Florida) x 30%[1]	158	--	8.8	1:2	Harrison (1992)
Adult female (California)	43	--	4.7	1:2	Harrison (1992)
Ecological greenways rule of thumb	--	35.3	3.5	1:10	T. Hoctor (personal communication)
Regional corridor	--	--	1.6	--	Noss (1992)
Medium distance corridor (California)	--	1-7	>0.4	--	Beier (1995)
Short distance corridor (California)	--	<0.8	>0.1	--	Beier (1995)

[1]Dispersing males in California used a series of transient home ranges 2-30% of the size of home ranges occupied by adult males during the same period (Beier 1995).

Table 18. Ownership of lands within the Primary, Dispersal, and Secondary zones.

Ownership	Primary Zone (ha)	Dispersal Zone (ha)	Secondary Zone (ha)	Total Area (ha)
Public land	671,654	-	222,653	894,307
Private land	200,356	11,284	98,396	310,036
Tribal land	46,886	-	7,605	54,491
Total area	918,896	11,284	328,654	1,258,834

Table 19. Area of 1995 WMD land use/land cover types within Florida panther Primary, Secondary, and Dispersal zones.

Land Use Class	Primary		Dispersal		Secondary			
Land Cover Type	Hectares	Percent	Hectares	Percent	Hectares	Percent	Total	Percent
Forest								
Cypress - gum swamp	249,038	27.10	1,298	11.51	7,458	2.27	257,795	20.48
Mixed hardwood swamp	101,224	11.02	573	5.08	11,173	3.40	112,971	8.97
Pine flatwoods	53,367	5.81	1,114	9.88	14,599	4.44	69,080	5.49
Hardwood forest	10,417	1.13	246	2.18	1,962	0.60	12,625	1.00
Tropical hardwood hammock	1,243	0.14	-	-	2	0.00	1,245	0.10
Bay swamp	44	0.00	-	-	8	0.00	52	0.00
Cabbage palm hammock	81	0.01	-	-	35	0.01	116	0.01
Pine plantations	5	0.00	42	0.37	46	0.01	93	0.01
Longleaf pine - xeric oak	-	-	-	-	-	-	-	-
Sand pine scrub	-	-	-	-	100	0.03	100	0.01
Pine forest	37	0.00	-	-	-	-	37	0.00
Xeric oaks	23	0.00	37	0.33	241	0.07	301	0.02
Forest Subtotal	415,479	45.22	3,312	29.35	35,623	10.84	454,414	36.10
Freshwater Marsh								
Freshwater marsh	374,253	40.73	844	7.48	140,615	42.79	515,713	40.97
Aquatic bed (floating leaved aquatics)	103	0.01	-	-	39	0.01	142	0.01
Freshwater Marsh Subtotal	374,356	40.74	844	7.48	140,654	42.80	515,854	40.98
Prairie and Shrub Lands								
Unimproved and woodland pasture	14,621	1.59	366	3.24	11,571	3.52	26,558	2.11
Palmetto prairies	8,656	0.94	615	5.45	8,441	2.57	17,711	1.41
Herbaceous rangeland	230	0.03	11	0.10	145	0.04	386	0.03
Shrub and brush	46	0.00	-	-	-	-	46	0.00
Shrub swamp	-	-	-	-	6	0.00	6	0.00
Prairie and Shrub Lands Subtotal	23,553	2.56	992	8.79	20,163	6.13	44,707	3.55
Agriculture								
Improved pasture	32,971	3.59	3,369	29.86	42,563	12.95	78,904	6.27
Agriculture, crops and special	24,764	2.70	913	8.09	29,552	8.99	55,229	4.39
Citrus groves	11,626	1.27	1,235	10.95	46,361	14.11	59,221	4.70
Agriculture, tree crops	285	0.03	9	0.08	28	0.01	322	0.03
Sod farms	509	0.06	-	-	767	0.23	1,276	0.10
Agriculture Subtotal	70,155	7.63	5,527	48.98	119,271	36.29	194,953	15.49

Table 19 (cont.). Area of 1995 WMD land use/land cover types within Florida panther Primary, Secondary, and Dispersal zones.

Land Use Class	Primary		Dispersal		Secondary			
Land Cover Type	Hectares	Percent	Hectares	Percent	Hectares	Percent	Total	Percent
Barren, Urban and Exotics								
Exotics	7,106	0.77	5	0.04	686	0.21	7,796	0.62
Barren land	2,965	0.32	193	1.71	2,370	0.72	5,528	0.44
Transportation	1,796	0.20	58	0.52	518	0.16	2,373	0.19
Communications	13	0.00	-	-	19	0.01	32	0.00
Urban, residential and commercial	1,283	0.14	50	0.45	3,299	1.00	4,632	0.37
Utilities	1,084	0.12	40	0.36	673	0.20	1,797	0.14
Urban, industrial	124	0.01	-	-	60	0.02	184	0.01
Urban, institutional	121	0.01	-	-	8	0.00	129	0.01
Recreational	205	0.02	-	-	39	0.01	244	0.02
Urban, open land	187	0.02	230	2.04	2,979	0.91	3,397	0.27
Mining	344	0.04	-	-	202	0.06	545	0.04
Coastal scrub	4	0.00	-	-	8	0.00	12	0.00
Sand	4	0.00	-	-	4	0.00	8	0.00
Barren, Urban, and Exotics Subtotal	15,236	1.66	576	5.10	10,864	3.31	26,675	2.12
Coastal Wetlands								
Mangrove swamp	7,531	0.82	-	-	14	0.00	7,545	0.60
Salt marsh	565	0.06	-	-	4	0.00	568	0.05
Non-vegetated wetlands	9,374	1.02	-	-	-	-	9,374	0.74
Coastal Wetlands Subtotal	17,470	1.90	-	-	18	0.01	17,488	1.39
Aquatic								
Water	2,646	0.29	34	0.30	2,062	0.63	4,742	0.38
Submerged aquatic vegetation	0	0.01	-	-	-	-	0	0.00
Aquatic Subtotal	2,646	0.30	34	0.30	2,062	0.63	4,742	0.38
Total Area	918,895	100	11,284	100	328,654	100	1,258,834	100

Table 20. Area of Florida panther Primary and Secondary zones on public and private conservation lands. The Dispersal Zone contained no conservation lands.

	Primary Zone		Secondary Zone		Both Zones	
Public/Private Conservation Land	Hectares	Percent	Hectares	Percent	Total	Percent
Big Cypress National Preserve	288,673	42.98	-	-	288,673	32.28
Everglades National Park	205,677	30.62	207	0.09	205,884	23.02
Everglades and Francis Taylor WMA	70,794	10.54	97,550	43.81	168,344	18.82
Fakahatchee Strand Preserve State Park	30,741	4.58	-	-	30,741	3.44
Picayune Strand State Forest	16,614	2.47	97,757	43.91	114,370	12.79
Southern Glades	12,495	1.86	-	-	12,495	1.40
Okaloacoochee Slough State Forest	12,249	1.82	714	0.32	12,963	1.45
Corkscrew Regional Ecosystem Watershed	9,630	1.43	116	0.05	9,745	1.09
Florida Panther National Wildlife Refuge	9,520	1.42	-	-	9,520	1.06
Corkscrew Swamp Sanctuary	4,291	0.64	-	-	4,291	0.48
Frog Pond/L-31 N Transition Lands	3,770	0.56	-	-	3,770	0.42
Holey Land WMA	2,319	0.35	11,707	5.26	14,026	1.57
Rotenberger WMA	1,894	0.28	9,826	4.41	11,719	1.31
Model Lands Basin	1,706	0.25	-	-	1,706	0.19
Collier-Seminole State Park	480	0.07	-	-	480	0.05
Okaloacoochee Slough WMA	375	0.06	813	0.36	1,188	0.13
Corkscrew Regional Mitigation Bank	163	0.02	96	0.04	258	0.03
Stormwater Treatment Areas	162	0.02	1,978	0.89	2,140	0.24
East Coast Buffer	81	0.01	26	0.01	107	0.01
Everglades Agricultural Area	13	0.00	1,106	0.50	1,119	0.13
Holiday Hammock	6	0.00	-	-	6	0.00
Hickey Creek Mitigation Park WEA	-	-	384	0.17	384	0.04
Greenbriar Swamp Preserve	-	-	173	0.08	173	0.02
Six Mile Cypress Slough Preserve	-	-	202	0.09	202	0.02
Total	671,654	100.00	222,653	100.00	894,307	100.00

Table 21. Area of land use classes within privately owned portions of the Primary Zone Based on 1995 WMD land use/land cover data.

Land Use	Cover Type	Area (ha)	Percent
Forest	Cypress - gum swamp	52,627	21.28
	Mixed hardwood swamp	30,084	12.16
	Pine flatwoods	20,631	8.34
	Hardwood forest	6,242	2.52
	Tropical hardwood hammock	5	0.00
	Bay swamp	39	0.02
	Cabbage palm	43	0.02
	Pine plantations	5	0.00
	Pine forest	37	0.02
	Xeric oaks	8	0.00
	Subtotal	109,723	44.36
Freshwater marsh	Freshwater marsh	43,552	17.61
	Aquatic bed	81	0.03
	Subtotal	43,633	17.64
Prairie and shrub lands	Unimproved and woodland pasture	13,113	5.30
	Palmetto prairies	5,091	2.06
	Herbaceous rangeland	220	0.09
	Shrub and brush	31	0.01
	Subtotal	18,455	7.46
Agriculture	Improved pasture	31,479	12.73
	Agriculture, crops and special	20,965	8.48
	Citrus groves	11,619	4.70
	Agriculture, tree crops	200	0.08
	Sod farms	491	0.20
	Subtotal	64,754	26.18

Table 21 (cont.). Area of land use classes within privately owned portions of the Primary Zone based on 1995 WMD land use/land cover data.

Land Use	Cover Type	Area (ha)	Percent
Barren, urban and exotics	Exotics	3,820	1.54
	Barren land	2,016	0.82
	Transportation	673	0.27
	Urban, residential, commercial	960	0.39
	Utilities	629	0.25
	Urban, industrial	98	0.04
	Urban, institutional	62	0.02
	Recreational	163	0.07
	Urban, open land	142	0.06
	Mining	272	0.11
	Coastal scrub	2	0.00
	Sand	1	0.00
	Communications	13	0.01
	Subtotal	8,852	3.58
Coastal Wetlands	Mangrove swamp	187	0.08
	Salt marsh	74	0.03
	Subtotal	261	0.11
Aquatic	Water	1,648	0.67
All Land Uses	Total	247,326	100

Table 22. Vital Rates for each of the four major Vortex models (based on Maehr *et al.* in press) and three RAMAS GIS scenarios. The vital rates are for females only; initial abundance and carrying capacity represent both males and females (*i.e.*, total).

Parameter	1989 Workshop	1992 Consensus	1992 Optimistic	1999 Consensus	Conservative	Moderate	Optimistic
Sex ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Survival 0-1	0.50	0.50	0.80	0.80	0.62	0.62	0.62
Survival 1-2	0.70	0.80	0.80	0.80	0.70	0.80	0.80
Survival 2-3	0.75	0.80	0.80	0.83	0.70	0.80	0.83
Survival 3+	0.75	0.80	0.80	0.83	0.75	0.80	0.83
Age at first reproduction[1]	3	2	2	2	3	2	2
% Females with litter	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Litter size	1.50	1.00	1.00	1.10	1.50	1.00	1.07
Fecundity[2]	0.375	0.250	0.400	0.429	0.465	0.310	0.332
Initial Abundance[3]	45	50	50	60	82	82	82
Carrying Capacity[4]	45	50	50	70	84	84	84
Deterministic Growth Rate[5]	0.9625	1.0928	1.000	1.1329	0.9849	1.0387	1.0770

[1] Age at first reproduction for females only

[2] Fecundity in the model is (daughters only): % with litter*litter size*1st year survival

[3] Initial abundance is based on total number of individuals and stable age distribution assumed; in the models it is assumed that ½ are females

[4] Half of the carrying capacity is assumed to be females; South Florida only

[5] Deterministic growth rate (or λ) is the finite rate of increase, which is the result of matrix analysis (eigenanalysis) ignoring density dependence, dispersal, catastrophes, stochasticity and effects of initial age/stage distribution, in RAMAS GIS.

Table 23. Comparison of Vortex model characteristics with RAMAS GIS model characteristics.

Vortex	RAMAS GIS
Individual-based	Population-based
Two sexes	Single sex
Simplistic structure	Complex structure
Strengths:	Strengths:
Genetic analysis	Spatially-explicit
Query-based	Stochasticity

Table 24. Comparison of the mean final abundance (females only), the probability of extinction, and the probability of a 50% decline in abundance in 100 years for four of the Vortex models and the three RAMAS GIS models. All models began with 41 females and a carrying capacity of 42 females with no habitat loss, no catastrophes or epidemics, and no supplementation.

Model	Mean Final Abundance	Probability of Extinction	Probability of 50% decline
1989 Workshop[1]	0.60	96.5%	93.7%
1992 Consensus[2]	11.99	39.7%	78.0%
1992 Optimistic[2]	64.18	0.1%	0.7%
1999 Consensus[3]	70.75	0.0%	0.0%
Conservative	3.48	78.5%	94.1%
Moderate	42.27	4.8%	19.9%
Optimistic	51.15	1.6%	9.1%

[1] from Seal and Lacy 1989
[2] from Seal and Lacy 1992
[3] from Maehr *et al.* in press

Table 25. Population guidelines for the Florida panther based on the results of population viability analyses.

Population Size	Viability
<50	Extinction highly probable in less than 100 years
	- demograhic instability
	- $N_e << 50$
	- high levels of inbreeding
60-70	Barely viable
	- low probability of extinction in 100 years
	- expect 25% population decline in 100 years
	- $N_e < 50$
	- declining heterozygosity
	- no habitat loss or catastrophes can be tolerated
80-100	Stable population likely for 100 years
	- low probability of extinction in 100 years
	- expect population to remain stable over 100 years
	- $N_e \cong 50$
	- slowly declining heterozygosity
	- no habitat loss or catastrophes can be tolerated
>240	High probability of persistence
	- low probability of extinction in 100 years
	- expect population to remain stable over 100 years
	- $N_e > 50$
	- able to retain 90% of heterozygosity
	- some habitat loss or mild catastrophes can be tolerated

Table 26. Habitat capacity of Florida panther Primary, Secondary, and Dispersal zones in southwest Florida.B1

Zone	Category	Break down	Area (ha)	Potential Number of Panthers (1/11,000 ha)	Potential Number of Panthers (1/12,955 ha)
Primary	Primary Zone total area	Public land (April 2001)	671,654	61	52
		Private land	200,356	18	15
		Tribal land	46,886	4	4
		Total area	918,895	84	71
	Potential habitat totals	Forest only	403,010	37	31
		200 m buffer	191,723	17	15
		Total potential habitat	594,733	54	46
	Potential habitat on public lands	Forest only	299,139	27	23
		200 m buffer	113,724	10	9
		Total potential habitat	412,863	38	32
	Potential habitat on tribal lands	Forest only	19,852	2	2
		200 m buffer	11,797	1	1
		Total potential habitat	31,650	3	2
	Potential habitat on private lands	Forest only	84,019	8	6
		200 m buffer	66,202	6	5
		Total potential habitat	150,220	14	12
Dispersal	Total area (all on private lands)	Total area	11,284	1	0
	Potential habitat total	Forest only	3,057	0	0
		200 m buffer	3,890	0	0
		Total potential habitat	6,947	1	0
Secondary	Secondary Zone total area	Public land (April 2001)	222,653	20	17
		Private land	98,396	9	8
		Tribal land	7,605	1	1
		Total area	328,654	30	25
	Potential habitat total	Forest only	25,360	2	2
		200 m buffer	45,565	4	4
		Total potential habitat	70,925	6	5
	Potential habitat on public lands	Forest only	1,939	0	0
		200 m buffer	4,870	0	0
		Total potential habitat	6,809	1	1
	Potential habitat on tribal lands	Forest only	12	0	0
		200 m buffer	86	0	0
		Total potential habitat	97	0	0
	Potential habitat on private lands	Forest only	23,410	2	0
		200 m buffer	40,609	4	3
		Total potential habitat	64,019	6	5

Table 27. Area of lands on Florida Forever and South Florida Water Management District acquisition lists for 2001 within panther Primary, Dispersal, and Secondary zones. Calculations are only for those portions of the projects not in public ownership as of October 2001.

Acquisition Program/Project	Area of Project in Primary Zone (ha)	Area of Project in Dispersal Zone (ha)	Area of Project in Secondary Zone (ha)	Total Area of Project (ha)	Percent of Project in Primary Zone	Percent of Project in Dispersal Zone	Percent of Project in Secondary Zone
Florida Forever							
Corkscrew Regional Ecosystem Watershed	17,911	-	105	18,089	99.0	-	0.6
Save Our Everglades	14,425	-	-	14,442	99.9	-	-
Panther Glades	10,617	-	445	11,062	96.0	-	4.0
Twelve Mile Slough	5,303	411	49	5,763	92.0	7.1	0.9
Belle Meade	3,086	-	408	3,494	88.3	-	11.7
East Everglades	1,789	-	46	19,685	9.1	-	0.2
Fakahatchee Strand	194	-	-	3,322	5.9	-	-
Dade County Archipelago	38	-	-	193	19.9	-	-
Caloosahatchee Ecoscape	-	6,572	834	7,495	0.0	87.7	11.1
Total	53,365	6,983	1,886	83,545			
South Florida Water Management District							
Corkscrew Regional Ecosystem Watershed	15,203	-	110	15,392	98.8	-	0.7
Water Conservation Area	12,801	-	7,468	20,294	63.1	-	36.8
Model Lands Basin	6,724	-	-	15,271	44.0	-	-
McDaniel Ranch	4,928	-	256	5,184	95.1	-	4.9
L31N Transition Lands	1,717	-	-	1,815	94.6	-	-
Twelve Mile Slough	1,659	-	4	1,662	99.8	-	0.2
Southern Glades	1,379	-	-	1,381	99.8	-	-
Okaloacoochee Slough	927	-	-	928	100.0	-	-
Barfield Ranch	523	-	-	523	100.0	-	-
East Coast Buffer	161	-	28	20,917	0.8	-	0.1
Stormwater Treatment Area 3/4	114	-	2,794	7,071	1.6	-	39.5
Stormwater Treatment Area 6	50	-	361	412	12.3	-	87.7
Caloosahatchee Basin Storage Reservoir	44	-	1,146	3,704	1.2	-	30.9
Frog Pond	37	-	-	41	91.4	-	-
Everglades Agricultural Area	21	-	1,681	11,240	0.2	-	15.0
Six Mile Cypress	-	-	8	118	0.0	-	6.9
Stormwater Treatment Area 5	-	-	5	5	0.0	-	98.3
Total	46,286	-	13,862	105,958			