

Attachment I

Wildlife Impacts

for:

Ridge Road Extension Alternatives Analysis

PREPARED FOR:



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Wildlife Impacts for Ridge Road Extension

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Attachment I

Wildlife Impacts

Potential impacts to wildlife were assessed at an individual species level. For individual species, the focus was on those species listed as Endangered or Threatened by the United States Fish and Wildlife Service (FWS) or Florida Fish and Wildlife Conservation Commission (FWC) and species listed as Special Concern by the FWC.

1.0 Methodology

Potential impacts to individual wildlife species were assessed as follows:

Available information on individual species was compiled. The information on individual species ranged from site-specific (surveys conducted for Ridge Road (EMS 1998; PHA and BRA 2001; BRA 2005; Cardno ENTRIX 2003; Serenova Development of Regional Impact (DRI) 1993; the River Ridge DRI, the Bexley DRI, DeCubellis Avenue Route Study, Final Environmental Impact Statement for the North Suncoast Corridor, and the Corridor Analysis Report for the Bi-County Expressway PD&E Study) to very general (data on home range size, dispersal distances, etc. such as that available from publications and the Florida Natural Areas Inventory (FNAI) on-line database. The most current FWS and FWC databases were reviewed for wood stork and wading bird colonies, Florida scrub-jays, and bald eagles.

The subsections below provide information on individual species known to occur or potentially occur that could be affected by the alternatives.

Each species was assessed qualitatively based on what is known from past and current studies, the Consultant's knowledge of its habitat requirements, occurrence and quantity of appropriate habitats, and condition of those habitats within each alignment. Some of the analyses were qualitative in nature as we are aware of no way to quantitatively tally important habitat characteristics such as connectivity. Where there are known quantitative features, such as acreage of wetlands or specific habitat types that correspond closely with likelihood of occupancy or population density, these were used in developing the species scores and are documented for the relevant species. Roadway modifications (such as road-bed elevation and fencing) were considered. Where an alternative had two alignments within it, the risks were assessed in terms of the overall impact which typically is at least as great as the impact for the alignment with the greatest impact. To keep the analyses comparable, each alternative was assigned a score for each species as follows:

Very High Impact (VH): Species is known to occur in the alternative or adjacent habitats and significant impact to the species and/or its habitat is anticipated at a level that could substantially affect long-term survival of the species in Florida or globally.

High Impact (H): Species is known to occur in the footprint of the alternative or adjacent habitats and moderate impact to the species and/or its habitat is anticipated at a level that could significantly affect long-term survival of local or regional populations

Moderate Impact (M): Species is known to occur in the footprint of the alternative or adjacent habitats and moderate impact to the species and/or its habitat is anticipated. Impacts are not

likely to substantially impact long-term survival of local or regional populations but are likely to affect abundance.

Low Impact (L): Substantial impact to the species is not anticipated, but some impact may occur if the species occurs in the alternative or adjacent habitats. The anticipated impact is likely to be minor and have little effect on local or regional abundance.

Very Low Impact (VL): Substantial impact to the species is not anticipated, but impact to individuals may occur if the species occurs in the alternative or adjacent habitats. This score was also assigned when a species is known to occur sporadically in the area.

No Impact (N): Species almost certainly not present and/or little or no habitat present. This impact level was assigned if the species occurs only as a rare dispersing juvenile with little or no potential to take up residence and find a mate (bear, panther), where the species is believed to have been extirpated from the region, or where the behavior of the species is such that it is highly unlikely to be affected by the roadway.

2.0 Findings

Results for each species are discussed below, and a summary table is provided at the end of this section.

American alligator (*Alligator mississippiensis*)

The alligator is listed by FWC and the FWS as Threatened (due to similarity of appearance with the American crocodile). The FWC allows an annual harvest of this species as it has recovered from a long history of uncontrolled harvesting and is now common in areas with appropriate habitats. Alligators can be found in most types of wetlands that have standing water and ample food supplies.

Alligators were observed in several of the lakes and ponds during all surveys including 2013. They almost certainly utilize most of the lakes and ponds that would be affected by any of the alternatives. However, due to the character of its habitat needs, the continuity of those habitats will remain as they readily use the streams which will remain open to them for all alternatives. Alligators will not be directly impacted by any alternative except for minor losses in the overall amount of wetland habitats. Indeed, the construction of new surface water management ponds for the highway will likely add alligator habitat. All ground-level alternatives were assigned a very low impact rating (VL). ..

Florida scrub-jay (*Aphelocoma coerulescens*)

The Florida scrub-jay, listed as Threatened by both the FWC and FWS, is an endemic Florida species found in scrub habitats. This gregarious jay is a habitat specialist. Optimal habitat is sparse within any potential alternative and all recent surveys that we are aware of suggest that no scrub-jays currently use habitat in any potential alternative. Repeated surveys have occurred since 1998 including an extensive survey for the RRE in 2013 (Cardno ENTRIX). This survey also included an intensive review of habitat conditions as they exist in 2013. No recent survey has documented occurrence of scrub-jays, and in 2003, most potential scrub and scrubby flatwoods habitats were too thick and/or too overgrown to be attractive as scrub-jay habitat. We are aware of management activities (controlled burns) on the Starkey Wilderness Area that could improve habitat conditions, but so far as we are aware, colonization has not

occurred and all alternatives are more than 5-miles, the documented dispersal limit, from known existing occupied scrub-jay habitats.

Based on the results of the surveys and the documented absence of scrub-jays either in, near, or within dispersal distance from occupied habitats, it is appropriate to assign a no impact (N) score for all the alternatives.

Florida burrowing owl (*Athene cuniculatia floridana*)

Representing a disjunct population of what is otherwise a western U.S. species, these owls, listed by the FWC as a Species of Special Concern, are most common in Florida west and north of Lake Okeechobee, but scattered breeding populations do exist elsewhere around the central portion of the state including Pasco County. They occupy burrows within dry prairies, agricultural land and disturbed urbanized areas. Open fields and pastures are plentiful in all alternatives, especially the central corridor alternatives; however, this species was not observed during our surveys (2001, 2005, 2013) or during surveys conducted for nearby projects and is not believed to inhabit any of the potential alignments with the possible exception of the SR 52 alignment. All alternatives were assigned a no impact (N) score except for the alternatives that included widening SR 52 which was assigned a very low (VL) score.

Eastern indigo snake (*Drymarchon corais couperi*)

The indigo snake, listed by both the FWC and FWS as Threatened, is a habitat generalist, using a variety of habitats from mangrove swamps to xeric uplands. Indigo snakes are often associated with gopher tortoise burrows, which they use as refugia from extreme temperatures (Moler 1992). These snakes require large tracts of natural, undisturbed habitat and have been documented to have home ranges of 125 – 250 acres (Moler 1992). They are also highly sensitive to habitat continuity and have been demonstrated to not occur or decrease in abundance where the habitat has been broken up into small parcels by roadways and other forms of development (Breininger et al. 2005; Breininger et al. 2011; Breininger et al. 2012). During intensive 2013 surveys in the areas of natural habitat included in this analysis, only a single shed was discovered. No indigo snakes were observed during the earlier surveys of the central alternatives (EMS 1998, BRA 2001, BRA 2005). In the region, only two indigo snakes (one adult, one shed skin) were observed during surveys of the Suncoast Parkway Phase I project (FDOT records), one was observed during fieldwork for the Bexley Ranch DRI (Cardno records) and none was seen during fieldwork for the Serenova DRI (1992). However, suitable habitat exists, and eastern indigo snakes occur in low densities on at least some portions of the alignments.

As a generality, any alternative that is a single roadway or which is restricted to more highly developed areas will have less potential to impact this species than alternatives that impact large areas of natural habitats. Alignments that allow snakes to move between natural habitats and which prevent snakes from wandering into the roadway have less impact than those which do not provide continuous habitat access or which endanger the species by road mortality. All alternatives that pass through the Serenova Tract of the Starkey Wilderness Area, the area with the highest quality habitat for eastern indigo snakes, have proposed fencing along the roadway to prevent road mortality. In the summary table, alternatives passing through contiguous blocks of natural habitat less than 100 acres in size were given low impact ratings (L). Those on habitat edges (fragmenting a habitat) and having no more than 10 acres of impact within that edge were likewise given low ratings (L). Alternatives through contiguous blocks of habitat 100

acres or more but not resulting in fragmentation to two non-contiguous habitat blocks less than 100 acres in size each were given low impact ratings (L) as appropriate habitat will remain to either side of the road. Alternatives resulting in fragmentation into one block smaller than 100 acres and one block greater than 100 acres were given a moderate impact rating (M). Those alternatives resulting in fragmentation of habitat into two blocks both less than 100 acres were given a high impact rating (H). If an alternative breaks multiple habitats into fragments too small to support indigo snakes (<100 acres), the pattern was assessed and the most appropriate (generally the highest) impact rating assigned. In general, the central corridor alternatives were assigned low ratings (L) as the blocks of contiguous habitat remained larger than 100 acres. The score was improved for any alternative where the majority of the large habitat areas remain contiguous due to elevation of the roadway.

Peregrine falcon (*Falco peregrinus*)

Peregrine falcon was formerly listed as Endangered by the FWC and FWS but has been delisted (delisted federally in 1999) because populations have rebounded. No peregrine falcons are known to use any of the potential alternatives.

The peregrine falcon is listed in the summary table with a very low impact rating (VL) for all alternatives.

Southeastern American kestrel (*Falco sparverius paulus*)

This resident subspecies of the kestrel, listed as Threatened by the FWC, can be distinguished from its cousin, *F. s. sparverius*, a migrant and common winter resident, by its smaller size. The southeastern American kestrel requires three components for optimal habitat; large, open fields for foraging; snags for nesting; and snags, fence lines or telephone poles as perching sites from which to hunt. Due to plentiful pasture and abandoned pasture, high quality habitat for the kestrel is plentiful.

Several kestrels were observed along the power line easement within the Starkey Wilderness Area during surveys in 1998, 2001 and 2005, and southeastern kestrels were reported in previous studies, and by a Pasco County biologist within the pasture area west of the Pithlachascotee River. No nest sites have been observed along any alternative. Considering the linear nature of the proposed construction, impacts to kestrels would be primarily to feeding habitat and not nesting habitat. As a generality, any alternative that is a single roadway, or restricted to more highly developed areas will have less potential to impact this species than alternatives that impact large areas of open habitats. In the summary table, potential impacts to this species were considered to be low (L) when there was less than 100 acres of improved pasture, unimproved pasture and palmetto prairie combined, and moderate (M) if there were more than 100 acres. Because this species is relatively abundant in the region, a high level of impact is not anticipated for any alternative.

Florida Panther (*Felis concolor coryi*)

The Florida panther is listed as Endangered by the FWS and FWC. All alternatives are outside of the known core range of the Florida panther (*Felis concolor*), which currently is restricted to large wilderness areas in south Florida (Maehr 1992), and outside of the United States Army Corps of Engineers' (USACE) Florida panther "consultation area." No evidence of panthers was detected during any surveys of the alternatives. Although panthers are free-ranging animals and, therefore, there is always a potential that one could pass through almost any property while traveling between wilderness areas, panthers are not expected to reside near any of the

alternatives. No alternative is anticipated to impact this species and so all were assigned a no impact (N) score.

Gopher tortoise (*Gopherus polyphemus*)

This species, listed as Threatened by the FWC and a candidate for listing as Threatened by the FWS, is a key factor in the determination of habitat suitability for listed species because of the large number of other animals that use tortoise burrows for one or more of their life requisites. While it is common to find tortoise burrows in most types of upland communities, the preferred habitats of gopher tortoise are xeric uplands and disturbed, ruderal areas. Gopher tortoises have been documented as occurring in xeric habitat areas on the central corridors. All alternatives in this updated analysis are known to pass through habitats that support tortoises (2003 wildlife surveys, Serenova DRI documentation). State permitting requirements for gopher tortoises require that all gopher tortoises be relocated, so impacts to individual tortoises should be minimal. Furthermore, while tortoises may dig under fences, the snake fencing will substantially decrease the likelihood the tortoises will attempt to cross the road. They will also readily use small wildlife crossings such as culverts. The primary impacts for all alternatives would likely be reduction in habitat and more-or-less proportional reduction in local population size unless tortoises are relocated on site.

Florida sandhill crane (*Grus canadensis pratensis*)

This non-migratory subspecies of the sandhill crane, listed as threatened by the FWC, can often be seen foraging in improved pastures and open fields. Cranes nest in emergent wetlands with water 1 - 3 ft in depth (Nesbitt 1996). During the winter months, it is distinguished from its northern cousins by its smaller size and more delicate stature. Sandhill cranes nest in freshwater marshes and feed in nearby fields and pastures. Prime nesting habitat is abundant along all alternatives. Wetlands used for nesting shift from year to year depending on water levels. As a generality, any alternative that is a single roadway, or raised or partially raised will have less potential to impact this species. In the summary table, this species was listed as likely to have low impacts (L) for alternatives with less than 10 acres of marsh habitats in the footprint of the roadway and moderate (M) for alternatives with more than 10 acres of marsh habitats. Adult sandhill cranes can easily fly over the roadway, but juveniles lack this capability. Alternatives that provide substantial open connectivity with wildlife crossings between habitats to either side of the road will have less impact than those with no crossings or small crossings.

Bald eagle (*Haliaeetus leucocephalus*)

The bald eagle is no longer listed by either the FWC or FWS. It was delisted by the FWS in 2007 because populations have rebounded to historic levels. The Bald and Golden Eagle Protection Act continues to prohibit anyone without a permit from "taking" bald eagles, including their parts, nests and eggs. Take includes pursuit, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting and disturbing.

No eagle nests are in close proximity to any of the alternatives.

The bald eagle is listed in the summary table with a very low (VL) impact rating for all alternatives.

Wood Stork and other Listed Wading Birds

The wood stork is listed as Threatened by the FWS and FWC. Its status was proposed to be set as Threatened in December 2012 (updated notice, January 2003). In addition, other wading

birds have been listed as Endangered, Threatened, or of Special Concern by the FWC, depending on the species. The initial alternatives analyses for Ridge Road focused on the group as a whole, and given the general similarity of required habitats for most species, that continues to be appropriate for this alternatives analysis. Of course when a specific route is identified appropriate consultation under the federal Endangered Species Act, if necessary, will be conducted on the wood stork.

All require both appropriate breeding and foraging habitats. Most of the listed species are colony breeders. The FWC database of breeding bird colonies that were active during the 1990s does not identify any colony as occurring with 0.5 mi of any alternative for any Ridge Road alternative. The 2010 FWC map of the wood stork colonies in Florida was also consulted. The project team is broadly aware of new wood stork and wading bird colonies that have formed in the area around the Ridge Road alternatives, but we are unaware of any colony within a half mile of of the footprint any potential alternative.

The USACE requested that a survey be conducted for the wood stork and other listed wading birds in 2003 to update previous surveys. Three helicopter surveys were conducted between January and April 2003. Cardno ENTRIX did not identify any new wading bird colonies, including no new wood stork colonies, near any alternative. Wading birds also require foraging habitats which typically shift with water levels and prey abundance. Due to dry conditions during the January-April survey period in 2003, foraging usage was restricted to deeper wetlands.

As a generality, alternatives with lesser wetland acreage within the footprint of the alternative and where the wetlands that are unaltered (dewatered by use of the immediate area as wellfield or by ditching) will have less impact on listed wading bird populations. One significant change that has occurred since the 2005 wildlife study is that the Starkey Wilderness Area, which is used as the Starkey and North Pasco wellfields by Tampa Bay Water (TBW), is now connected by pipeline to the TBW central system. This connection was enabled to allow TBW to “rest” these wellfields. The Starkey Wellfield (not the North Pasco Wellfield) has shown improvements in wetland condition since 2007. However, the results of the 2013 helicopter surveys suggest that those parts of the alignments on the Starkey Wilderness Area were predominantly dry throughout the time period when birds would most need to forage (during the breeding season), so this area may continue to be impacted by water withdrawals (the Serenova Tract of the Starkey Wilderness Area hosts the North Pasco Wellfield). Most wetlands near alternatives within the Serenova Preserve were hydrated during much of 2014.

In the summary table, it was assumed that the relative impact of an alternative would be proportionate to the wetland impact acreage. This value is conservative as it does not downgrade wetlands for being dry from historic (Starkey and North Pasco) or continued operation (North Pasco) of wellfields.

Striped Newt (*Notophthalmus perstriatus*)

The striped newt is a candidate for listing by the FWS.

Longleaf pine sandhill with embedded ephemeral wetlands is the preferred habitat for the striped newt (Means and Means 2008). Sexually mature adults migrate from uplands to fishless, ephemeral wetlands to breed in November-February. Courtship, copulation, and egg-laying take place mid-winter to early spring, and eggs hatch beginning in April. Larvae live in

ponds until mid-summer when they either metamorphose or remain in the pond and grow, eventually maturing as a paedomorph (Petranka 1998, Johnson 2005). If the pond goes dry, then larvae must either metamorphose or perish. The eft stage is adapted for life in the uplands, almost always a longleaf pine-wiregrass forest (Means 2008), though micro-habitat use is poorly known. Minimum water residency time in the breeding wetland is approximately 6-7 months, from December-January through June (Means 2008). When efts return to the wetland to breed, they enter the wetland and undergo another metamorphosis into aquatic adults.

The range of the striped newt is small and restricted to parts of South Georgia and the northern half of the Florida peninsula, and the eastern Florida Panhandle (Conant and Collins 1998). Various surveys have been conducted to document the occurrence and distribution of striped newts in Florida and Georgia. Based on the most recent compilation of records, the closest known striped newt breeding areas to the Ridge Road alignment are in Citrus and Sumter Counties (Krysko et al. 2011) approximately 45 miles distant.

The striped newt was not included in the initial alternatives analysis as it was not then a candidate for listing. It was listed in 2011 as a candidate and is therefore included in this version. Cardno ENTRIX completed surveys for this species in selected wetlands with USACE concurrence in 2003. Based on the results of this survey and the known locations where the species has been found, it appears that it is not present in the vicinity of the alternatives in this analysis. Therefore, all were assigned a no-impact (N) score.

Red-cockaded woodpecker (*Picoides borealis*)

The red-cockaded woodpecker is listed by the FWS and FWC as Endangered. The colonial red-cockaded woodpecker (RCW) is a habitat specialist, requiring stands of over-mature pine that have contracted the red-heart disease. RCWs require diseased, live trees in which to construct cavities. Habitat requires pine canopies with little or no dense understory or tall shrubs to allow easy flight. RCWs must also have ample foraging habitat of pines surrounding the cavity tree. RCW habitat is known to have occurred in the vicinity of the RRE, however, no active colonies have been present since many years prior to 1998 (abandoned cavity trees were seen several miles from any of the alternatives (on the Starkey Wellfield) during surveys for the Suncoast Parkway. A 2003 survey (Cardno ENTRIX) confirmed the continued absence of RCWs. Existing surveys and available documentation also supports a lack of RCW colonies along any potential alternative. All alternatives were assigned a no impact (N) score.

Florida pine snake (*Pituophis melanoleucus mugitus*)

This snake, listed as a Species of Special Concern by the FWC, is a gopher tortoise burrow commensal utilizing both tortoise burrows and the tunnels of pocket gophers (*Geomys pinetis*) for feeding and shelter. Preferred habitat of the pine snake is xeric uplands. Radio telemetry of pine snakes in north central Florida revealed variable home ranges of 27 to 240 acres for the individuals tracked (Franz 1992). Suitable habitat is common within the project. No pine snakes were observed during the gopher burrow inventories in 2005 or 2003. As a generality, any alternative that is a single roadway, restricted to more highly developed areas, or partially or entirely raised above ground level through suitable habitats will have less potential to impact this species than alternatives that impact large areas of natural xeric habitats, but population levels for this species are anticipated to be low. With the proposed fencing, these snakes are unlikely to experience road mortality. In the summary table, alternatives containing

25 acres or more xeric habitats (FLUCFCS 431 or 413) were given a moderate (M) impact rating. All others were given a low impact rating (L).

Florida mouse (*Podomys floridanus*)

This mouse, listed as a Species of Special Concern by the FWC, is one of two mammal species that are endemic to Florida. It typically lives within gopher tortoise burrows in fire-maintained, xeric uplands. Suitable habitat (xeric oak, 431 and longleaf pine/xeric oak, 413) is present within alternatives areas. Project specific surveys (EMS 1998) and the Serenova DRI (BRA 1993) indicated the presence or probable presence of Florida mice in areas with appropriate habitats in the central alternatives. As a generality, any alternative that is a single roadway, raised through appropriate habitats, or which is restricted to more highly developed areas will have less potential to impact this species than alternatives that impact large areas of natural habitats.

In the summary table, an impact rating of low (L) was given to alternatives where the acreage of xeric habitat with longleaf and/or sand pine and/or xeric oaks (FLUCFCS 413 plus FLUCFCS 431 plus FLUCFCS 413) was 10 acres or less as this species is not highly mobile, moderate (M) where the acreage was between 10 and 75, and high (H) where there were more than 75 acres of suitable habitat in an alternative. Since home ranges are small and the species is not very mobile, road elevation likely does not have much effect on the population.

Suwannee cooter (*Pseudemmys concinna suwanniensis*)

The Suwannee cooter, listed as a Species of Special Concern by the FWC, is a relatively large emydid (pond or marsh) turtle, and is a subspecies of the river cooter (*Pseudemmys suwanniensis*) that can be found from the Apalachicola River and southward. This cooter is found in rivers, spring-runs and backwater swamps, but is not known to occur in the Pithlachascotee or Anclote River, or tributaries (Jackson 1992). It is not a very common turtle, and has been determined to have only a low likelihood of occurrence for any of the alternatives. Impacts to the turtle's habitat will be low (L), since the riverine systems of concern will be bridged. Alternatives not requiring new bridged river crossings were assigned a no impact (N) score.

Gopher frog (*Rana capito*)

The gopher frog (*Rana capito*), listed as a Species of Special Concern by the FWC, is a commensal of the gopher tortoise, occurring almost exclusively where gopher tortoises are found. Prime gopher frog habitat includes xeric uplands, especially longleaf pine-turkey oak associations, with nearby (within one mile), seasonably flooded marshes or ponds. Gopher frogs were observed during 2005 wildlife surveys (BRA 2005) and they likely occur in xeric habitats throughout the central alternatives. Very few gopher frogs were observed during the tortoise surveys in 2013 (gopher frogs are a burrow commensal of the gopher tortoise). Alternatives with a mixture of isolated ponds and dry uplands (all central alternatives) were assigned moderate impact ratings (M), except that the raised alternatives were assigned low impact ratings (L) as the raised areas are in the areas with the majority of appropriate habitats, substantially reducing the potential for impacts.

Sherman's fox squirrel (*Sciurus niger shermani*)

The Sherman's fox squirrel is listed by the FWC as a Species of Special Concern. Optimum habitat for this subspecies is composed of longleaf pine-turkey oak sandhills, although they also can be found in mesic forested areas as well. Home range sizes for Sherman's fox squirrel

average approximately 50 to 100 acres (Kantola 1992). Suitable habitat is present on both phases of the RRE. The squirrel is fairly common in localized areas, including the along all alternatives in this analysis. As a generality, any alternative that is a single roadway, restricted to more highly developed areas, or raised or partially raised will have less potential to impact this species than alternatives that impact large areas of natural habitats.

In the summary table, an impact rating of low (L) was given to alternatives where the acreage of xeric habitat with longleaf pine and xeric oaks (FLUCFCS 413 plus FLUCFCS 431) was 50 acres or less as this species is mobile. Actual loss of animals is unlikely where the amount of habitat loss is small, moderate (M) where the acreage was between 50 and 100 acres, and high (H) where the acreage of suitable habitat exceeded 100 acres. For partially elevated alternatives, the level of impact was reduced as there is less likelihood of animals being killed on the road.

Short-tailed snake (*Stilosoma extenuatum*)

The short-tailed snake, listed as Threatened by the FWC, belongs to a monotypic genus endemic to Florida. It is restricted to xeric uplands, primarily longleaf pine-turkey oak sandhills, for its habitat requirements. Suitable habitat is present along the RRE in both phases, but this rare species was not observed during any of the RRE wildlife surveys or during previous studies in which trapping was conducted; therefore, it has been determined to have a low likelihood of occurrence within the RRE area. As a generality, any alternative that is a single roadway, restricted to more highly developed areas, or with raised or partially raised roadbed will have less potential to impact this species than alternatives that impact large areas of natural habitats. With the proposed fencing, these snakes are unlikely to experience road mortality. In the summary table, alternatives containing 10 acres or more xeric habitats (FLUCFCS 414, 421 or 413) were given a moderate (M) impact rating. All others were given a low rating (L). This snake is unlikely to cross a roadway, so alternatives with substantial sections of elevated roadbed were given a higher rating because the elevated sections likely will be highly important to maintenance of gene exchange in the population.

Florida black bear (*Ursus americanus floridanus*)

The Florida black bear is not listed by the FWS or FWC. It was delisted in 2012 by the FWC, at which time a management plan for the bear was established (FWC 2012).

Regular sightings of the black bear in Pasco County are limited to the extreme northwestern corner associated with the small (20-25 individuals) Weeki Wachee River/Chassahowitzka Swamp population and a disjunct population within the Green Swamp in eastern Pasco County (Mary Barnwell, SWFWMD, pers. comm.). Several sightings have been reported from the Starkey Wilderness Area, the most recent being in 2003 when a poacher shot and killed a bear. As a generality, any alternative that is a single roadway, restricted to more highly developed areas, or raised or partially raised will have less potential to impact this species than alternatives that impact large areas of natural habitats. Alternatives that provide crossings for large wildlife species will have less impact than those that do not. Alternatives increasing the number of roads are increasing road widths were assigned higher impacts since road crossings are a major source of mortality for black bear. Impacts can be minimized by fencing and wildlife under-crossings, or raising sections of roadway. In the summary table, low impacts (L) were assigned to all alternatives assuming that all will be fenced within the Starkey Wilderness Area. However, since bear do periodically occur and since roadway impacts are a major source of

bear mortality, and since the fencing may not keep bear off the road, the impact potential was further reduced for alternatives with significant areas of elevated roadway.

Plants

The only federally listed plant species known to occur in Pasco County is Britton's beargrass (*Nolina brittoniana*). It is not known from any potential alternative, though recent burn management in the Starkey Wilderness Area could provide improved habitat for this species. *Nolina brittoniana* was not observed during surveys in 2013 or during any previous surveys. At USACE request, 2013 surveys also included two additional federally listed species, Brooksville bellflower (*Campanula robinsiae*), known from Hernando and Hillsborough counties, and Cooley's water-willow (*Justicia cooley*), known from Hernando, Sumter and Lake counties. Neither was observed, and no habitats conditions appropriate for either species were seen along the alignment.

State listed plants have been observed on and near the central alternatives. Two were observed during the 2005 surveys (pine lily (*Lilium catesbaei*) and blue butterwort (*Pinguicula caerulea*) and one, giant orchid (*Pteroglossaspis ecristata*), was seen in 2008. None was reported in 2013, likely due to inappropriate weather (blue butterwort) or survey season (pine lily). Both are listed by the Department of Agriculture and Community Services (FDACS) as Rare and Imperiled, respectively and are broadly distributed in the state. FDACS listed species known to occur on the Starkey Wilderness Area south of the potential alternatives (Ferguson 2004) include *Tillandsia utriculata* (Endangered) and *Garberia heterophylla*, *Lilium catesbaei*, *Lobelia cardinalis*, *Pteroglossaspis ecristata*, *Spiranthes laciniata*, and *Zephyranthes atamasca* var. *treatiae* (all Threatened). Other state listed species known to occur in close proximity to one or more alternatives are pondspice (*Litsea aestivalis*, (personal knowledge and TBW consultant reports) and hooded pitcher plant (*Sarracenia minor*, Serenova DRI).

As a generality, any alternative that is a single roadway or which is restricted to more highly developed areas will have less potential to impact listed plants than alternatives that impact large areas of natural habitats. Impact was considered to be approximately proportionate to the number of acres of potential habitat. In the summary table, potential impacts to a species were considered to be non-existent (N) if there is no potential habitat, very-low (VL) when there are impacts to less than 10 acres of potential habitat, low when there were impacts to 11-100 acres of natural habitat, moderate (M) if there were 101-200 acres of impact, and high (H) to very high (VH) if more than 200 acres.

Species Impact Summary by Alternative

The table below lists all potential alternatives and rates each on its potential to impact individual listed species. This table is intended to provide support at an individual species level to the general ranking based on the FWC Integrated Wildlife Habitat Ranking System.

Table I-1. Summary Table Showing Wildlife Scores

| Species Analysis | Alternative | | | | | | | | | | | | | | | |
|---|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| <i>Alligator mississippiensis</i> (American alligator) | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| <i>Aphelocoma coerulescens</i> (Florida scrub-jay) | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| <i>Athene cuniculata floridana</i> (burrowing owl) | N | N | N | N | N | N | VL | N | N | N | N | VL | VL | N | VL | N |
| <i>Drymarchon corais couperi</i> (eastern indigo snake) | L | L | L | L | VL | VL | VL | VL | VL | N | VL | VL | VL | L | L | L |
| <u><i>Falco peregrinus</i></u> (Peregrine falcon) | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| <i>Falco sparverium paulus</i> (southeastern American kestrel) | M | M | M | M | L | M | L | VL | M | VL | M | L | L | M | M | M |
| <i>Felis concolor coryi</i> (Florida panther) | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| <i>Gopherus polyphymus</i> (gopher tortoise) | L | L | L | L | VL | L | L | VL | L | N | L | L | L | L | L | L |
| <i>Grus canadensis pratensis</i> (Florida sandhill crane) | M | M | M | M | L | M | L | L | M | VL | M | M | M | M | M | M |
| Wood stork (<i>Mycteria americana</i>) and other listed wading birds | L | L | L | L | VL | VL | L | L | L | VL | L | L | L | L | L | L |
| <u><i>Haliaeetus leucocephalus</i></u> (American bald eagle) | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL | VL |
| <i>Notophthalmus perstriatus</i> (striped newt) | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |

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