# Guidelines for Implementation of
# Land Development Code Section 804
# - Ecological Corridors -
# Minimal Standards and Design

**Pasco County**

**May 11, 2015**

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## Section 1 - Permitted Uses within Ecological Corridors

The following uses may be authorized upon evaluation for consistency with the intent and purpose of the Permitted Uses Section under Section 804 of the Pasco County Land Development Code (LDC) and with prior written approval by the County Administrator or designee. All proposed activities within the Ecological Corridors shall be adequately described and contained in an approved EMP and shall include a projected timeline for completion of all work.

1) Specific approvals may be obtained for the trapping and/or removal, in compliance with Florida Fish and Wildlife Conservation Commission (FFWCC) game laws and management guidelines, of feral hogs and other exotic animal species (e.g., tegu lizards, *Tupinambus* species) that are declared a nuisance by the agency. Due to the proximity of development and the wildlife purposes of Ecological Corridors, no hunting shall be allowed in Ecological Corridors which are publically owned. Ecological Corridors established by Conservation Easement may reserve non-commercial hunting rights as a right of the Grantor, which may expire during the conservation easement.

2) Specific approvals must be obtained for control and/or removal of invasive plant species on the most recent Florida Exotic Pest Plant Council Invasive Plant List, both Category I and Category II.

3) Boardwalks, pervious and semi-pervious walking/hiking trails, and/or observation structures may be approved. However, taking into consideration that even passive nature trails result in significant negative edge effects the number, location, position, and total length must all be approved by County staff. Boardwalks and other structures shall not fragment the corridor, reduce the ability of the corridor to function as a genetic exchange pathway and transit for wildlife, impede the flow of water, or alter the biological and ecological integrity of the corridor. Trails shall be constructed using pervious material only. Semi-pervious material may be used in some instances.

4) Selected agricultural activities such as cattle ranching and timber management following Best Management Practices (BMPs) and an Environmental Management Plan (EMP) may be approved. Agricultural activities in existence prior to development approval may continue at the same intensity, so long as the activity has been included in the rezoning conditions, development order, or development agreement and does not fragment the corridor, reduce



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the ability of the corridor to function as a genetic exchange pathway and transit for wildlife, impede the flow of water, or alter the biological and ecological integrity of the corridor. With any continuing agricultural activities, the proposed program must use the BMPs for the proposed activity, as determined by the United States Department of Agriculture, the Florida Department of Agriculture and Consumer Services, the Natural Resources Conservation Services, or other appropriate Federal or State agency, and must be included in and implemented by the approved EMP.

5) Approvals may be granted for wetland mitigation through creation, preservation, enhancement, and restoration as indicated in an approved EMP. Creation shall not consist of the removal of wetland organic soil and/or natural plant communities.

6) Wetland Mitigation:

   a) Must be in conjunction with an approved restoration or habitat management plan and all required approvals and permits from the United States Army Corps of Engineers (USACE), and the Southwest Florida Water Management District (SWFWMD), and the Florida Department of Environmental Protection (DEP).

   b) Could conditionally take the form of ecological restoration if staff deems the ecology of the site to be suitable for such restoration.

   c) Mitigation plan shall be comprised of a diverse set of habitat types that includes both uplands and wetlands. The design must ensure that the corridor is sufficiently buffered from adjacent non-compatible land uses such as high density development, industrial and commercial.

   d) Shall not interrupt the functional integrity of the natural community in the ecological network.

   e) Shall not fragment the corridor, reduce the ability of the corridor to function as a genetic exchange pathway and transit for wildlife, impede the flow of water, or alter the biological and ecological integrity of the corridor.

   f) Compensation and modifications to the existing surface elevations shall include a restoration plan which retains the upper 18 inches of topsoil and post-construction



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returns it to the modified area. Topsoil may not be permanently removed. The restoration plan shall include a restock and planting of suitable native vegetation, based on the original soils type and target habitat, in conformance with the approved EMP.

g) For all approved wetland mitigation activities in the Ecological Corridors, a Performance Bond shall be posted in favor of Pasco County to assure project success criteria are met as well as completion, maintenance, and monitoring.

7) Selective logging and vegetative removal may be approved if it enhances the corridor's natural condition and is approved as part of the EMP. An activity which enhances the corridor's natural condition is one that more closely matches the original natural community's vegetative composition and/or structure, as evidenced by soils and hydrologic regime and as defined in current scientific literature.

8) Wildlife crossings in accordance with Section 2 may be permitted.

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**End of Section 1**

## Section 2 – Wildlife Crossing Designs

It is critical that the characteristics of the connected habitats and of the target species shall be the basis for planning each wildlife crossing design.

The purpose of a wildlife crossing, an all-inclusive term that includes underpasses, overpasses, small culvert crossings and large underpass bridges, is to prevent fragmentation between two or more significant habitat areas by facilitating movement of wildlife necessary to maintain healthy and viable populations. The following criteria are based upon the research of wildlife-dedicated and multi-purpose designs found in existing crossings throughout the State of Florida and across the United States. Consideration of new, emerging designs, based on a growing understanding of wildlife use and acceptance of improved designs and methods, will be evaluated by the County Administrator or designee as they are proposed. Site-specific design, focusing on the target species type or guild and size is necessary for the effectiveness of any wildlife crossing.

Potential Crossing Types:

- **Single-span bridges** with no intermediate support columns.
- **Multiple span bridges** with one or more intermediate support columns.
- **Box culvert** has four sides including a bottom. There are two types of box culverts.
    - **Continuous culvert is** continuous where the bottom portion may or may not be buried.
    - **Bottomless culvert** is discontinuous and is either rounded, oval, arched or square with natural bottom.

Wildlife Crossing Design Criteria:

1) The crossing cannot compromise any local, State, or Federal safety criteria.

2) The crossing cannot have the potential to negatively affect existing drainage patterns or flood off-site properties.

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3) The crossing must not restrict ingress/egress to adjacent property owners. In this instance, a modified design that functionally accommodates both uses, such as funneling fencing, may be approved.

4) The crossing must have positive drainage such that standing water is not present or trapped under normal conditions. Slotted drain culverts can be utilized to ensure proper moisture and drainage are maintained.

5) If the crossing is constructed beneath a roadway wider than 80 feet, grating shall be incorporated at the surface to allow for natural lighting within the crossing. Additional surface grating shall be installed every 80 feet or more frequently as determined to be necessary. Design should address potential washouts and scouring of substrate within the crossing.

6) If the crossings are constructed beneath a roadway wider than 80 feet or with a pervious median, the open portion of the crossings within the median shall have green-coat fencing, a minimum of 10 feet high in locations where black bears are a target species, and eight feet for other large mammals, preventing access to the roadway above.

7) A minimum of two wildlife crossing passages shall be installed for each crossing with the base elevation at or above the documented seasonal high water (SHW) elevation and allowing for direct contact with the adjacent ground. This is in addition to any water conveyance structure that is required.

8) In all cases, the specific design, size, and location of the crossing shall be provided to the Florida Department of Transportation (FDOT), District Seven, Environmental Management Section; the FFWCC; and the County Administrator or designee for review and comment prior to construction plan approval. In the case of Federal jurisdiction, the United States Fish and Wildlife Service (USFWS) shall also be consulted.

9) Roadway lighting shall be directed away from the Ecological Corridor through the use of shielding and minimum illumination by using a vegetative buffer, berm, or fence. Ambient-light intrusion shall be reviewed by the County Administrator or designee and possibly approved.

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10) The species of vegetation, landscaping, and right-of-way plantings on approaches to the crossing shall simulate or be a subset of the native plant species in the adjacent natural community.

11) Crossing substrate shall be consistent with adjacent soils, (i.e. foreign road-bed construction materials are not appropriate).

12) Crossing design shall maximize use of existing topography to enhance usage by wildlife.

13) Fencing is a critical aspect to wildlife crossing success. Fencing will be required for specified distances to the crossing necessary to funnel wildlife to the crossing. Length, type, minimum height, and mesh size shall be selected based on target species. Fencing length shall extend from the either side of the structure, across the entire length of the parcel boundary, or, at a minimum, just outside the adjacent natural landscape features.

Figures 1 through 7 represent typical designs of undercrossings which generally meet the intent of these guidelines. Site conditions and target species would determine which design to use. Site-specific design is the key to the effectiveness of each crossing.

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**Figure 1**

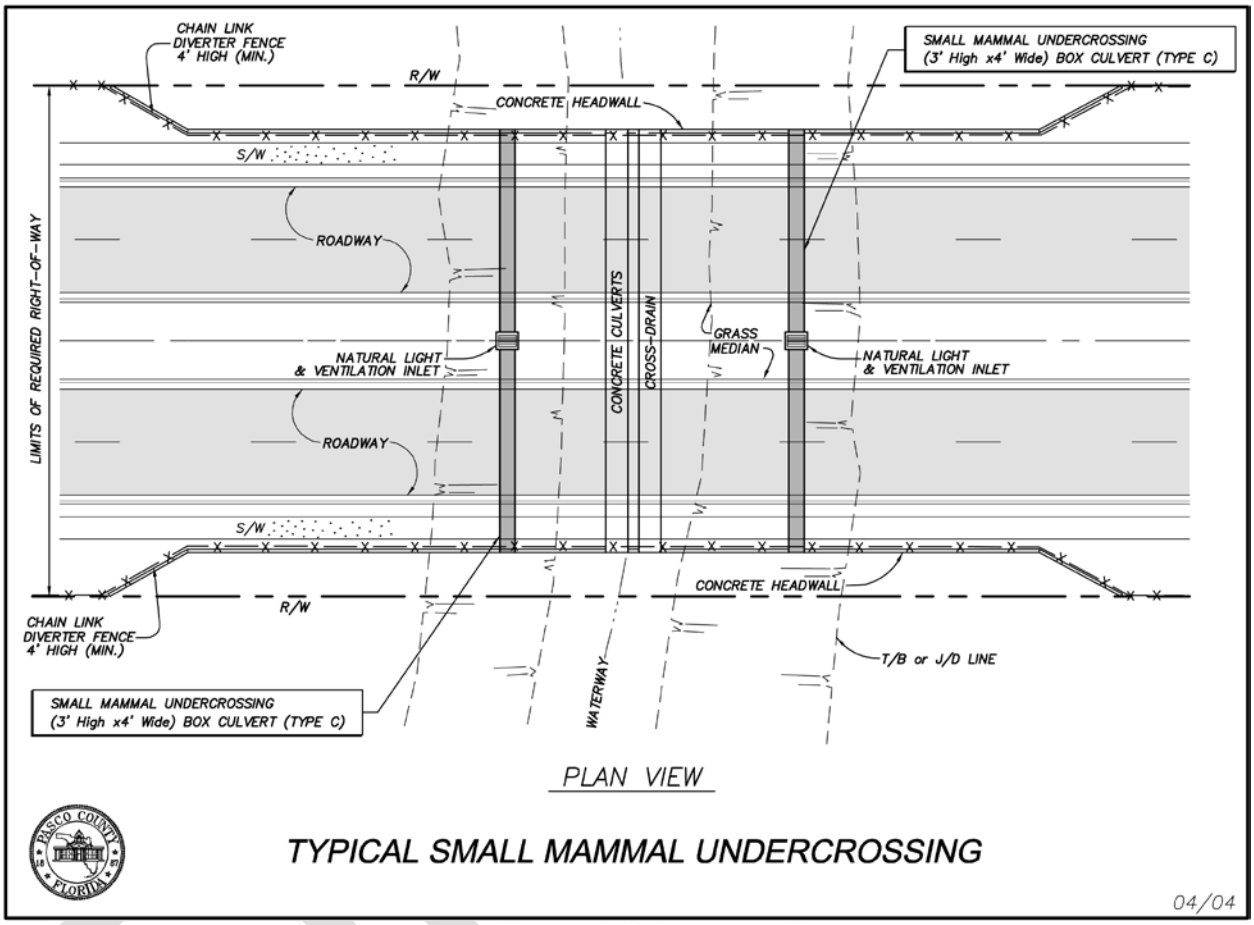

CHAIN LINK DIVERTER FENCE 4' HIGH (MIN.)
R/W
CONCRETE HEADWALL
SMALL MAMMAL UNDERCROSSING (3' High x4' Wide) BOX CULVERT (TYPE C)
S/W
ROADWAY
LIMITS OF REQUIRED RIGHT-OF-WAY
CONCRETE CULVERTS
CROSS-DRAIN
GRASS MEDIAN
NATURAL LIGHT & VENTILATION INLET
NATURAL LIGHT & VENTILATION INLET
ROADWAY
S/W
CONCRETE HEADWALL
R/W
CHAIN LINK DIVERTER FENCE 4' HIGH (MIN.)
T/B or J/D LINE
WATERWAY
SMALL MAMMAL UNDERCROSSING (3' High x4' Wide) BOX CULVERT (TYPE C)
PLAN VIEW
PASCO COUNTY FLORIDA
TYPICAL SMALL MAMMAL UNDERCROSSING
04/04

**Figure 2**

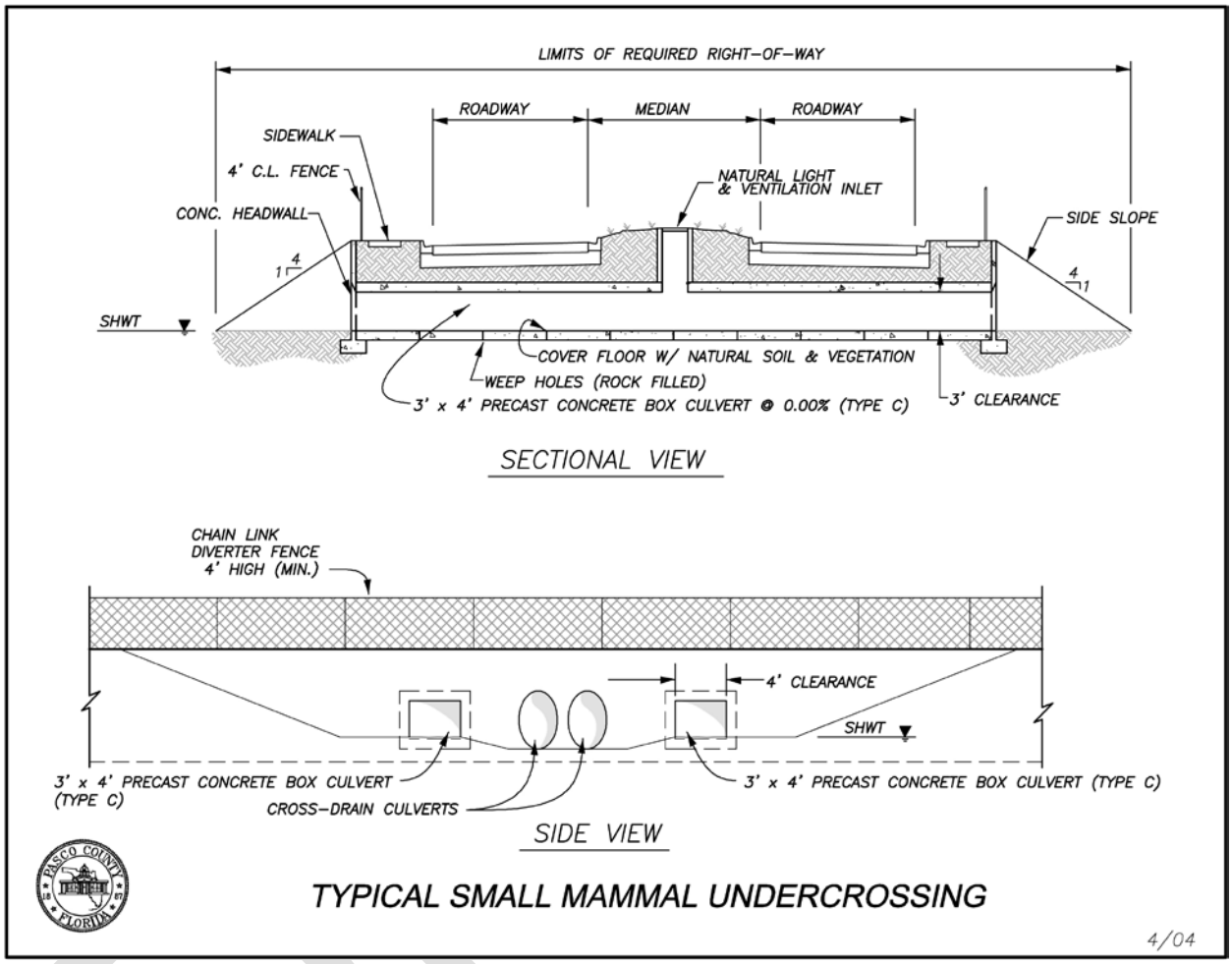

LIMITS OF REQUIRED RIGHT-OF-WAY
ROADWAY
MEDIAN
ROADWAY
SIDEWALK
4' C.L. FENCE
NATURAL LIGHT & VENTILATION INLET
CONC. HEADWALL
SIDE SLOPE
SHWT
COVER FLOOR W/ NATURAL SOIL & VEGETATION
WEEP HOLES (ROCK FILLED)
3' x 4' PRECAST CONCRETE BOX CULVERT @ 0.00% (TYPE C)
3' CLEARANCE
SECTIONAL VIEW
CHAIN LINK DIVERTER FENCE 4' HIGH (MIN.)
4' CLEARANCE
SHWT
3' x 4' PRECAST CONCRETE BOX CULVERT (TYPE C)
CROSS-DRAIN CULVERTS
3' x 4' PRECAST CONCRETE BOX CULVERT (TYPE C)
SIDE VIEW
PASCO COUNTY FLORIDA
TYPICAL SMALL MAMMAL UNDERCROSSING
4/04

**Figure 3**

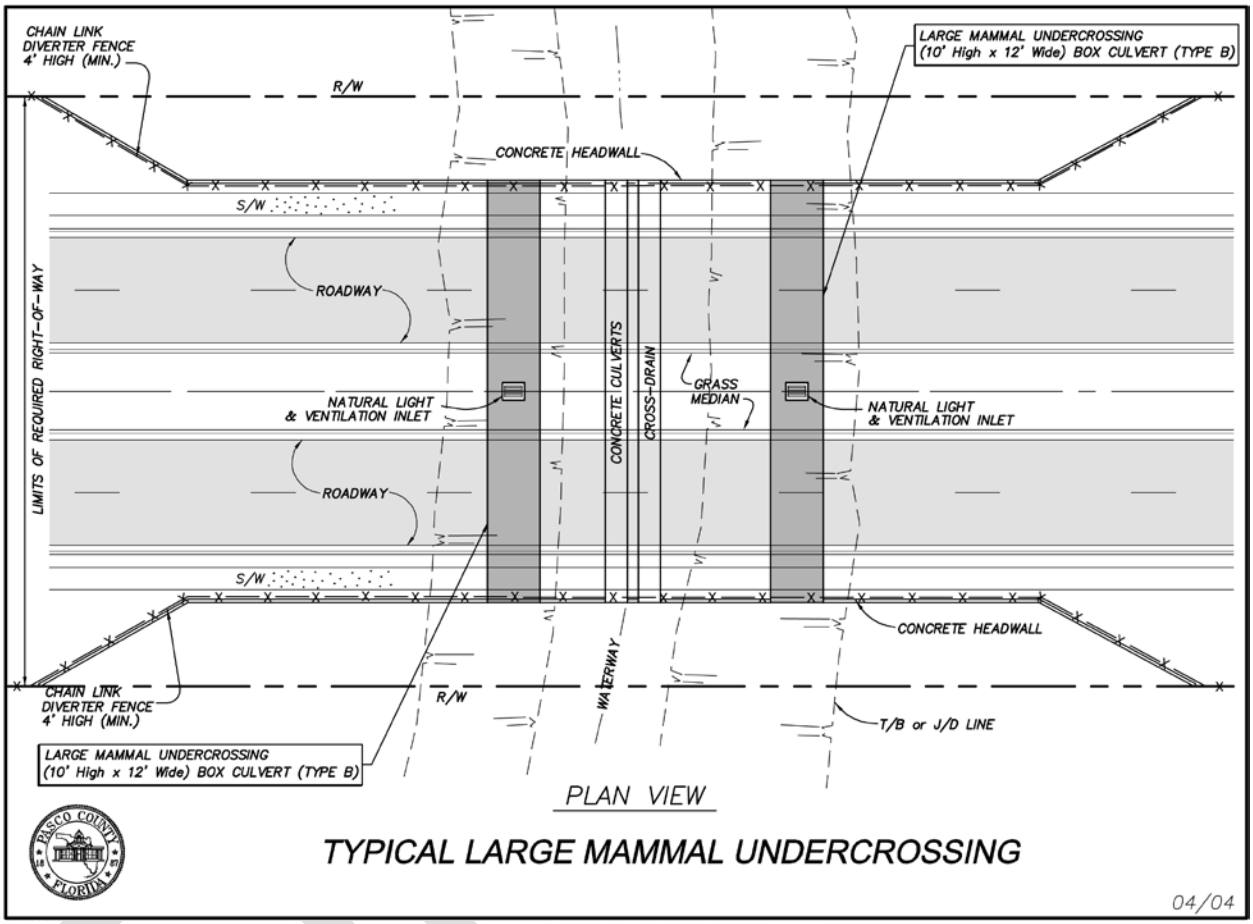

CHAIN LINK
DIVERTER FENCE
4' HIGH (MIN.)
R/W
LARGE MAMMAL UNDERCROSSING
(10' High x 12' Wide) BOX CULVERT (TYPE B)
CONCRETE HEADWALL
S/W
ROADWAY
LIMITS OF REQUIRED RIGHT-OF-WAY
CONCRETE CULVERTS
CROSS-DRAIN
GRASS
MEDIAN
NATURAL LIGHT
& VENTILATION INLET
NATURAL LIGHT
& VENTILATION INLET
ROADWAY
S/W
CONCRETE HEADWALL
WATERWAY
CHAIN LINK
DIVERTER FENCE
4' HIGH (MIN.)
R/W
T/B or J/D LINE
LARGE MAMMAL UNDERCROSSING
(10' High x 12' Wide) BOX CULVERT (TYPE B)
PLAN VIEW
PASCO COUNTY
FLORIDA
TYPICAL LARGE MAMMAL UNDERCROSSING
04/04

**Figure 4**

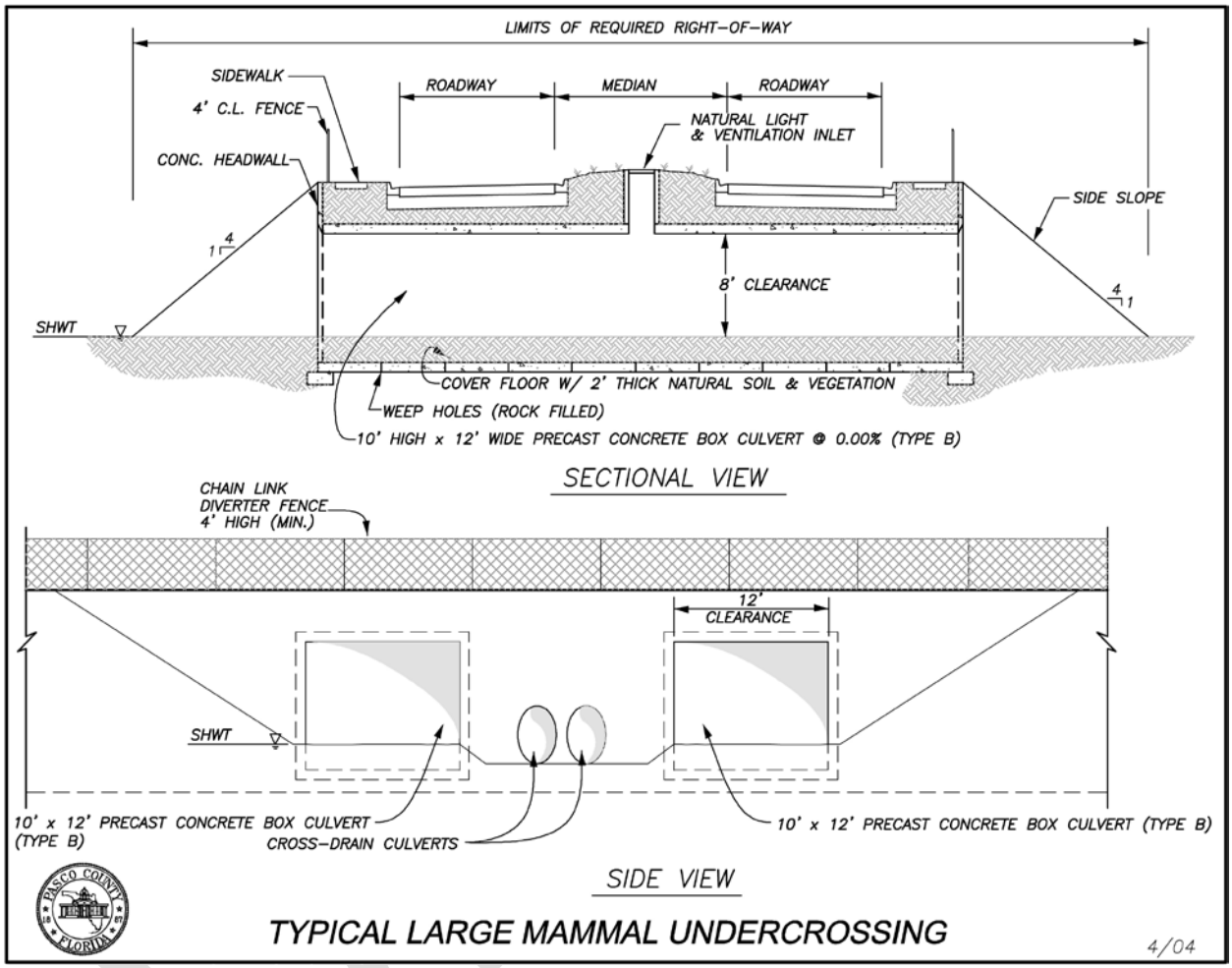

LIMITS OF REQUIRED RIGHT-OF-WAY
SIDEWALK
4' C.L. FENCE
CONC. HEADWALL
ROADWAY
MEDIAN
ROADWAY
NATURAL LIGHT & VENTILATION INLET
SIDE SLOPE
1 4
8' CLEARANCE
4 1
SHWT
COVER FLOOR W/ 2' THICK NATURAL SOIL & VEGETATION
WEEP HOLES (ROCK FILLED)
10' HIGH x 12' WIDE PRECAST CONCRETE BOX CULVERT @ 0.00% (TYPE B)
SECTIONAL VIEW
CHAIN LINK DIVERTER FENCE 4' HIGH (MIN.)
12' CLEARANCE
SHWT
10' x 12' PRECAST CONCRETE BOX CULVERT (TYPE B)
CROSS-DRAIN CULVERTS
10' x 12' PRECAST CONCRETE BOX CULVERT (TYPE B)
SIDE VIEW
PASCO COUNTY FLORIDA
TYPICAL LARGE MAMMAL UNDERCROSSING
4/04

**Figure 5**

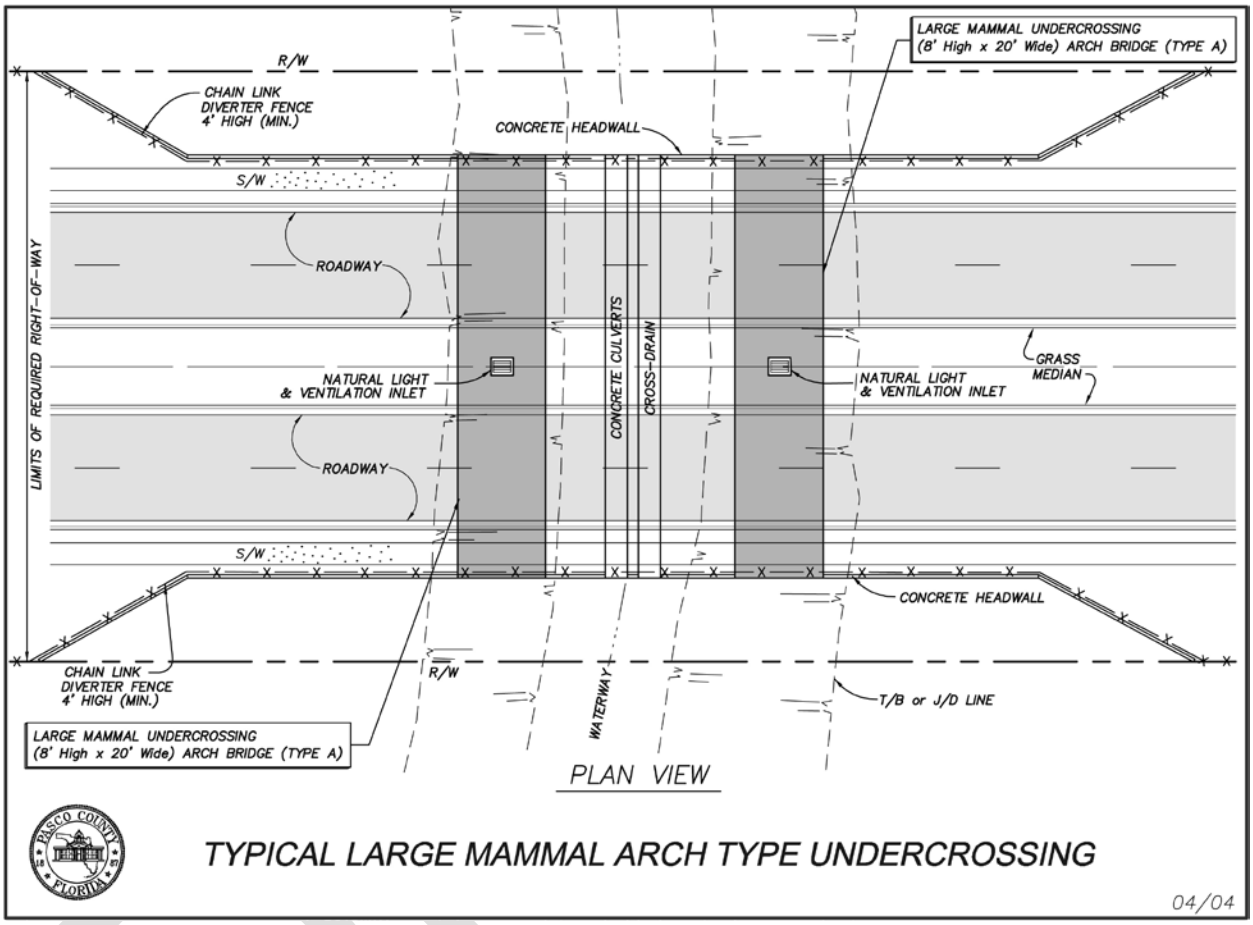

LARGE MAMMAL UNDERCROSSING
(8' High x 20' Wide) ARCH BRIDGE (TYPE A)
R/W
CHAIN LINK
DIVERTER FENCE
4' HIGH (MIN.)
CONCRETE HEADWALL
S/W
ROADWAY
LIMITS OF REQUIRED RIGHT-OF-WAY
CONCRETE CULVERTS
CROSS-DRAIN
NATURAL LIGHT
& VENTILATION INLET
GRASS
MEDIAN
ROADWAY
S/W
CONCRETE HEADWALL
CHAIN LINK
DIVERTER FENCE
4' HIGH (MIN.)
R/W
WATERWAY
T/B or J/D LINE
LARGE MAMMAL UNDERCROSSING
(8' High x 20' Wide) ARCH BRIDGE (TYPE A)
PLAN VIEW
PASCO COUNTY
FLORIDA
TYPICAL LARGE MAMMAL ARCH TYPE UNDERCROSSING
04/04

**Figure 6**

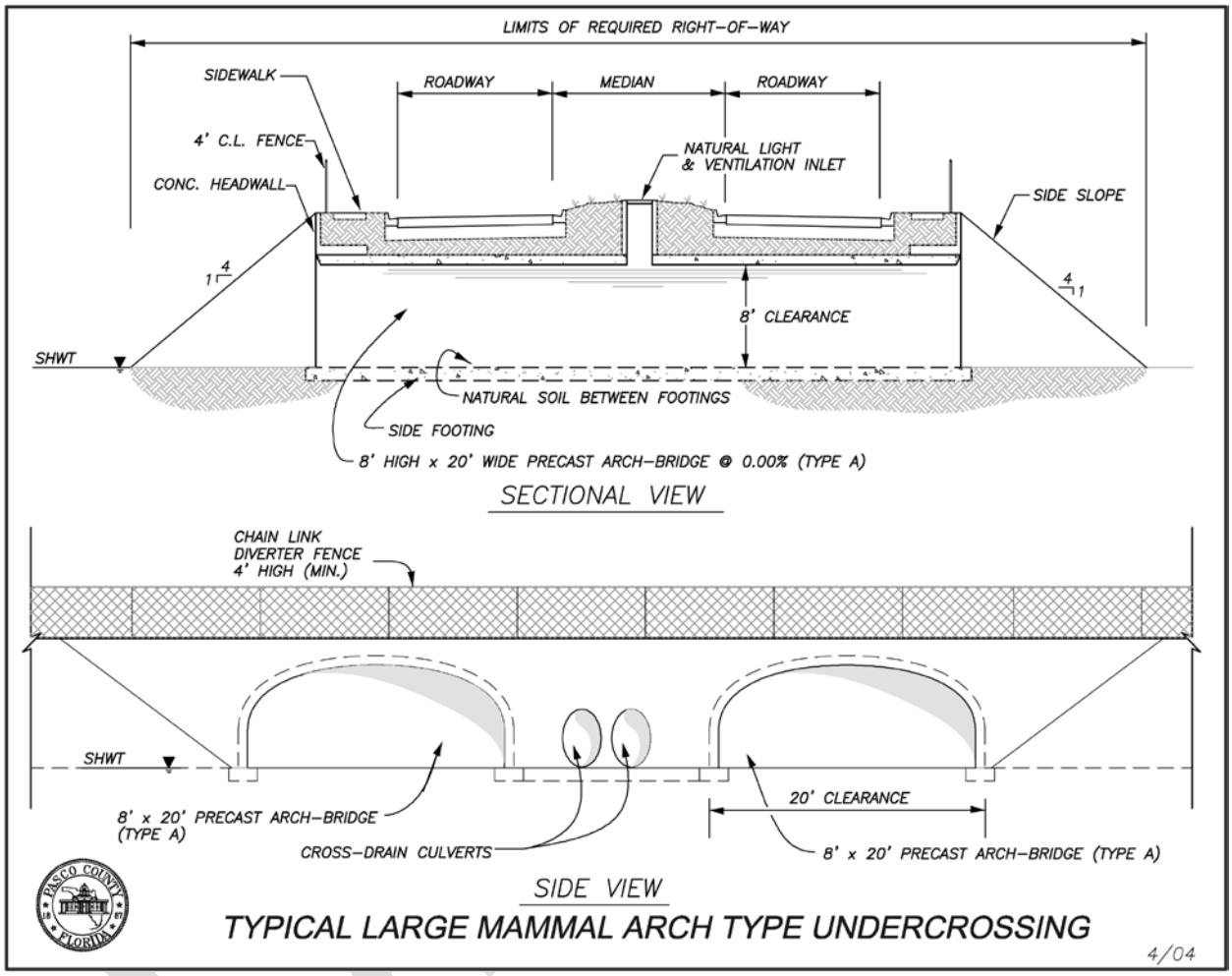
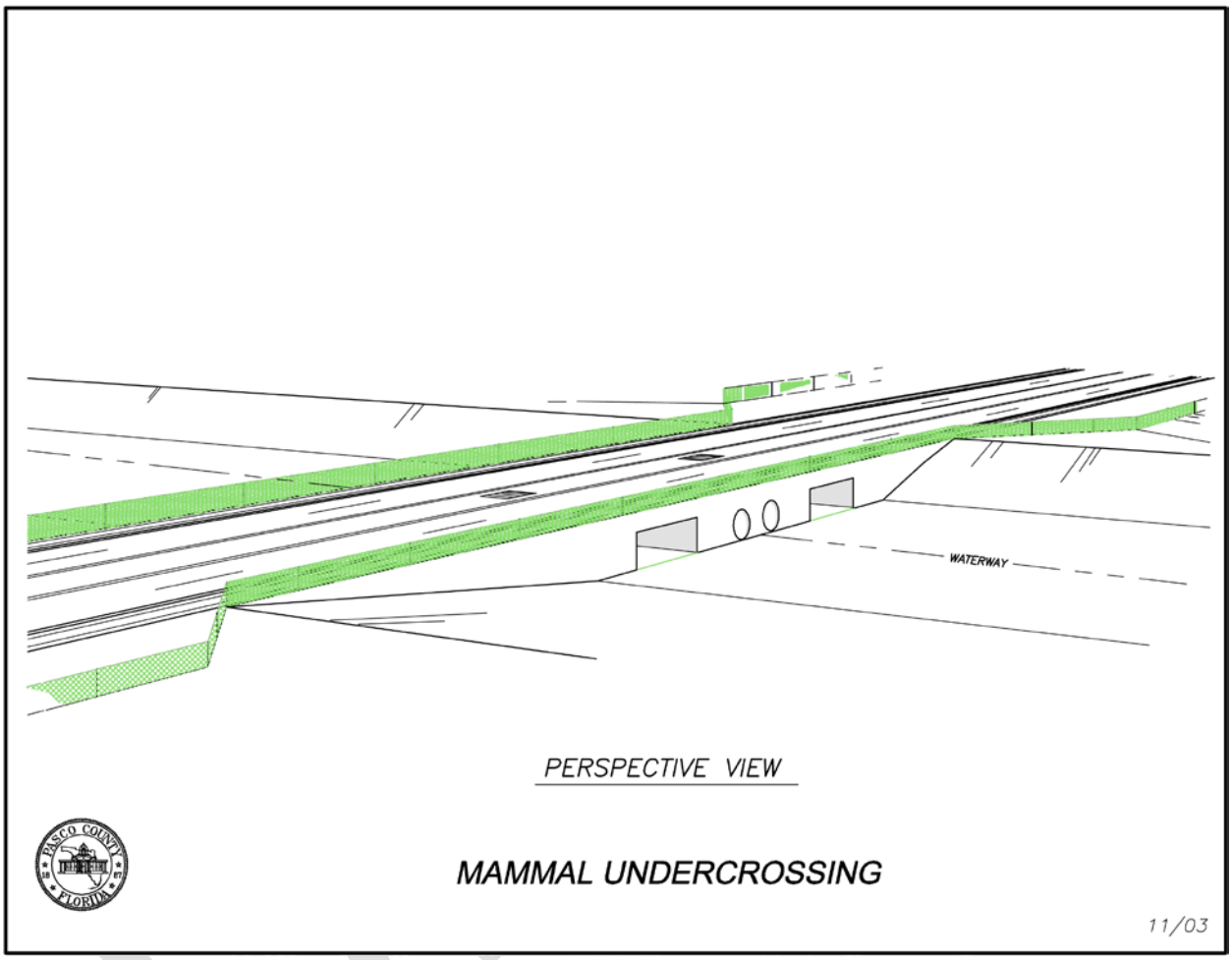

LIMITS OF REQUIRED RIGHT-OF-WAY
SIDEWALK
ROADWAY
MEDIAN
ROADWAY
4' C.L. FENCE
NATURAL LIGHT & VENTILATION INLET
CONC. HEADWALL
SIDE SLOPE
1 4
4 1
8' CLEARANCE
SHWT
NATURAL SOIL BETWEEN FOOTINGS
SIDE FOOTING
8' HIGH x 20' WIDE PRECAST ARCH-BRIDGE @ 0.00% (TYPE A)
SECTIONAL VIEW
CHAIN LINK DIVERTER FENCE 4' HIGH (MIN.)
SHWT
8' x 20' PRECAST ARCH-BRIDGE (TYPE A)
CROSS-DRAIN CULVERTS
20' CLEARANCE
8' x 20' PRECAST ARCH-BRIDGE (TYPE A)
SIDE VIEW
TYPICAL LARGE MAMMAL ARCH TYPE UNDERCROSSING
4/04

**Figure 7**




**End of Section 2**

## Section 3 - Density/Intensity Transfers (LDC §804.10)

A key benefit to a property owner with land in the Ecological Corridor is that density/intensity can be transferred from the Ecological Corridor to less sensitive sites. The transfer may be to another portion of the same property or to a site elsewhere in the County. Uplands within a Ecological Corridor will receive a 25 percent density/intensity bonus. Thus, the non-Ecological Corridor uplands will therefore have 125 percent of the density/intensity otherwise permitted by the Comprehensive Plan.

**Transfer Within the Site**

If the transfer is to take place on-site, the details of the transfer will be determined during the MPUD rezoning process and are subject to zoning and LDC requirements. When the MPUD is approved, the details of the transfer will be included in the conditions of approval.

Density/intensity shall not be transferred to areas such as, but not limited to:

- Designated CON (Conservation Lands) on the Future Land Use Map;
- Coastal High Hazard Area;
- Transportation Corridor;
- Wetlands;
- Agricultural Reserve Lands in accordance with *Assessment of Measures to Protect Wildlife Habitat in Pasco County*, March 2002, as amended (requires review prior to approval to protect sensitive natural areas;)
- Ecological Planning Units (requires review prior to approval to protect sensitive natural areas);
- Land uses otherwise identified in the Comprehensive Plan as not suitable for transferable density; and
- Ecological Corridors

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**Off-Site Transfer**

If the transfer is to take place off-site, density/intensity may also be used elsewhere in the County, with limitations. Density/intensity shall not be transferred to areas such as, but not limited to:

- Any location which would be prohibited on-site, as addressed above;
- Land with the following Future Land Use (FLU) Classifications:
  - AG (Agricultural)
  - AG/R (Agricultural/Rural)
  - RES-1 (Residential - 1 du/ga)
  - CON (Conservation Lands)
- Land Within a:
  - Rural Character Area
  - Rural Neighborhood Protection Area
  - Rural Transition Area
  - Rural Protection Area
  - Northeast Pasco Rural Area
- Drainage Basin of Special Concern
- Any other land area specifically designated in the Comprehensive Plan as not being suitable for transferable density.

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**Off-Site Transfer Market Areas**

In the south and west market areas there is no limit on the amount of density/intensity to be transferred; however, other requirements in LDC shall apply. In the north, central and east market areas, intensity/density transfers are limited to one step above the Comprehensive Plan density. For example, a receiving property in RES-6 (Residential - 6 du/ga) would be eligible for density that would result in RES-9 (Residential - 9 du/ga).

As with on-site transfers, the details of the transfer will be determined during the MPUD rezoning process and are subject to zoning and LDC requirements. When the MPUD is approved, the details of the transfer will be included in the conditions of approval.

However, it will not always be possible for a receiving site to be identified at the time of rezoning of the property containing the Ecological Corridor. When off-site density/intensity transfer is approved but the receiving site has not been identified, a certificate shall be issued to prove eligibility for the transfer elsewhere at a later time, subject to the LDC, Section 804, and these guidelines.

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## Transfer Calculations

The following are examples of sample density calculations.

An interactive worksheet is available on the County website.

Example One is a 100-acre parcel with 50 acres in the Ecological Corridor; 10 of those acres are wetland in RES-3 (Residential – 3 du/ga).

Example Two has 100 acres in RES-3 (Residential - 3 du/ga) and 200 acres in RES-9 (Residential - 9 du/ga).

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# Example One - Discussion Table

| Discussion | Spreadsheet |
|---|---|
| | |
| 1. Enter the total acres of the property in question by FLU Classification.<br><br>***In this example we have 100 acres on the entire property and it is all in RES-3 (Residential - 3 du/ga)*** | Line 1, RES-3 (Residential - 3 du/ga):<br><br>100 Acres |
| | |
| 2. Enter the acres in the Ecological Corridor.<br><br>***Our Ecological Corridor has 50 acres.*** | Line 2, RES-3 (Residential - 3 du/ga):<br><br>50 Ecological Corridor Acres |
| | |
| 3. Enter the acres of wetlands, for each category of wetlands, in the Ecological Corridor. Add them together to find the total Ecological Corridor Wetland Acres.<br><br>***For this example, we have:***<br><br>***5 acres Category I***<br>***2 acres Category 2***<br>***3 acres Category 3***<br><br>***The total wetland acreage in the Ecological Corridor is 10 acres.*** | Line 3:<br><br>5 Acres<br><br>Line 4:<br><br>2 Acres<br><br>Line 5:<br><br>3 Acres |
| | |
| 4. Subtract the total Ecological Corridor Wetland Acres from the Ecological Corridor Acres. This results in the Ecological Corridor Upland Acres.<br><br>***In our example,***<br>***5 + 2 +3 = 10***<br>***50 – 10 = 40 Ecological Corridor Upland Acres*** | Line 6:<br><br>40 Ecological Corridor Upland Acres |
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| Discussion | Spreadsheet |
|---|---|
| 5. Enter the FLU density (dwelling units per acre) in Line 7. Multiply the Ecological Corridor Upland Acres by the density in Line 7. This results in the Ecological Corridor Base Transfer Units.<br><br>***In our example there are 40 Upland Ecological Corridor Acres. This is multiplied by the RES-3 (Residential - 3 du/ga) density of 3 to show 120 base transfer units in Line 8.*** | Line 7:<br><br>3 Dwelling Units per Acre<br><br>Line 8:<br><br>120 Ecological Corridor Base Transfer Units |
| | |
| 6. The Ecological Corridor awards a 25 percent density bonus. Multiply the Base Transfer Units x 0.25. This results in the Ecological Corridor Bonus Transfer Units.<br><br>***In our case, 120 x 0.25 = 30*** | Line 9:<br><br>30 Ecological Corridor Bonus Transfer Units |
| | |
| 7. Add the Ecological Corridor Bonus Transfer Units to the Ecological Corridor Base Transfer Units. This results in the Ecological Corridor Upland Transfer Units.<br><br>***In our case, 150 units may be transferred from the upland portion of the Ecological Corridor.*** | Line 10:<br><br>150 Ecological Corridor Upland Transfer Units |
| | |

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| Discussion | Spreadsheet |
|---|---|
| 8. Category 1 wetlands in the Ecological Corridor award a 25 percent bonus. Multiply the Category 1 wetland acres by 0.25 by FLU density (dwelling units per acre). This results in the Category I Wetland Bonus Units.<br><br>Categories 2 and 3 wetlands in the Ecological Corridor award a 10 percent bonus. Add the Category 2 and Category 3 wetland acres. Multiply this total x 0.1 x FLU density (dwelling units per acre). This results in the Categories 2 and 3 Wetland Bonus Units.<br><br>Add the Category 1 Wetland Bonus Units and the Categories 2 and 3 Wetland Bonus Units. This results in the total Ecological Corridor Wetland Bonus Units.<br><br>Category 1 Acres x 0.25 x Density of FLU<br><br>plus<br><br>(Category 2 + Category 3 Acres) x 0.1 x Density of FLU<br><br>**In our case this is:**<br><br>**(5 x 0.25 x 3) + (5 x 0.1 x 3) = 3.75 + 1.5 = 5.25** | Line 11:<br><br>Ecological Corridor Wetland Bonus Units<br><br>5.25 |
| | |
| 9. Add the Upland Transfer Units to the Wetland Bonus Units. This results in the Total Ecological Corridor Transfer Units.<br><br>***In our case, 150 Upland Transfer Units are added to 5.25 Wetland Bonus Units for a total of 155.25 units, rounded down to 155 units.**** | Line 12:<br><br>Total Ecological Corridor Transfer Units:<br><br>155 |

**Note: Any density calculation that yields a figure greater than .5 shall be rounded up, and less than or equal to .5 shall be rounded down.*

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# Example One - Spreadsheet

| Line No. | | CON | AG | AG/R | Res-1 | Res-3 | Res-6 | Res-9 | Res-12 | Res - 24 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Total Developable Acres[1]** | | | | | 100 | | | | | |
| 2 | **Ecological Corridor Acres** | | | | | 50 | | | | | |
| 3 | EC Class 1 Wetland | | | | | 5 | | 0 | | | |
| 4 | EC Class 2 Wetland | | | | | 2 | | 0 | | | |
| 5 | EC Class 3 Wetland | | | | | 3 | | 0 | | | |
| 6 | ***Ecological Corridor Upland Acre*** | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | |
| 7 | ***Density*** | **0** | **0.1** | **0.2** | **1** | **3** | **6** | **9** | **12** | **24** | |
| 8 | ***EC Base Transfer*** | **0** | **0** | **0** | **0** | **120** | **0** | **0** | **0** | **0** | |
| 9 | ***EC Bonus Transfer*** | **0** | **0** | **0** | **0** | **30** | **0** | **0** | **0** | **0** | |
| 10 | ***EC Upland Transfer*** | **0** | **0** | **0** | **0** | **150** | **0** | **0** | **0** | **0** | |
| 11 | ***Wetland Bonus*** | **0** | **0** | **0** | **0** | **5.25** | **0** | **0** | **0** | **0** | |
| 12 | ***Total Transfer from EC[2]*** | **0** | **0** | **0** | **0** | **155.25** | **0** | **0** | **0** | **0** | **155** |

*Notes: [1] Total Developable Acres shall mean that portion of the total site that can be developed for uses inclusive of street and utilitiy rights-of-way, parks, community facilities, etc. but does not include any acreage classified as wetlands, conservation lands, or water bodies.*

*[2] Any density calculation that yields a figure greater than .5 shall be rounded up; less than or equal to .5 shall be rounded down.*

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# Example Two - Discussion Table

| Discussion | Spreadsheet |
|---|---|
| | |
| 1. Enter the acres in each FLU Classification.<br><br>***In this example we have 100 acres in RES-3 (Residential - 3 du/ga) and 200 acres in RES-9 (Residential - 9 du/ga).*** | Line 1:<br><br>RES-3 (Residential - 3 du/ga):<br>100 Acres<br><br>RES-9 (Residential - 9 du/ga):<br>200 Acres<br><br>**Total: 300 Acres** |
| | |
| 2. Enter the Ecological Corridor Acres in each FLU Classification..<br><br>***Our Ecological Corridor has 50 acres in RES-3 (Residential - 3 du/ga) and 50 acres in RES-9 (Residential - 9 du/ga).*** | Line 2:<br><br>RES-3 (Residential - 3 du/ga):<br>50 Ecological Corridor Acres<br><br>RES-9 (Residential - 9 du/ga):<br>50 Ecological Corridor Acres<br><br>**Total: 100 Acres** |
| | |

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| Discussion | Spreadsheet |
|---|---|
| 3. Enter the acres of each category of wetland in the Ecological Corridor, in each FLU Classification. Add the wetland category acres in each FLU Classification together to find the total Ecological Corridor Wetland Acres in each FLU Classification.<br><br>***In our RES-3 acres, we have:***<br><br>***5 acres Category I***<br>***2 acres Category 2***<br>***3 acres Category 3***<br><br>***In our RES-9 acres, we have:***<br><br>***20 acres Category I***<br>***0 acres Category 2***<br>***0 acres Category 3***<br><br>***The total wetland acreage in the RES-3 Ecological Corridor is 10 acres.***<br><br>***The total wetland acreage in RES-9 Ecological Corridor is 20 acres.*** | Line 3 (Category 1):<br><br>RES-3 (Residential - 3 du/ga):<br>5 Ecological Corridor Wetland Acres<br><br>RES-9 (Residential - 9 du/ga):<br>20 Ecological Corridor Wetland Acres<br><br>Line 4 (Category 2):<br><br>RES-3 (Residential - 3 du/ga):<br>2 Acres<br><br>RES-9 (Residential - 9 du/ga):<br>0 Acres<br><br>Line 5 (Category 3):<br><br>RES-3 (Residential - 3 du/ga):<br>3 Acres<br><br>RES-9 (Residential - 9 du/ga):<br>0 Acres |
| | |

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| Discussion | Spreadsheet |
|---|---|
| 4. For each FLU Classification, subtract the total Ecological Corridor Wetland Acres from the Ecological Corridor acres. This results in the Ecological Corridor Upland Acres for each FLU Classification.<br><br>***RES-3 Ecological Corridor Acres = 50***<br>***RES-3 Ecological Corridor Wetland Acres = 10***<br>***50 – 10 = 40 RES-3 Ecological Corridor Upland Acres***<br><br>***RES-9 Ecological Corridor Acres = 50***<br>***RES-9 Ecological Corridor Wetland Acres = 20***<br>***50 – 20 = 30 RES-9 Ecological Corridor Upland Acres*** | Line 6:<br><br>RES-3 (Residential - 3 du/ga):<br>40 Ecological Corridor Upland Acres<br><br>RES-9 (Residential - 9 du/ga):<br>30 Ecological Corridor Upland Acres |
| | |
| 5. Enter the FLU density (dwelling units per acre) in Line 7, for each Land Use Classification. For each FLU Classification, multiply the Ecological Corridor Upland Acres by the density in Line 7. This results in the Ecological Corridor Base Transfer Units for each FLU Classification.<br><br>***40 Ecological Corridor Upland Acres x 3 du/ga = 120 Ecological Corridor Base Transfer Units in RES-3, on Line 8.***<br><br>***30 Ecological Corridor Upland Acres x 9 du/ga = 270 Ecological Corridor Base Transfer Units in RES-9, on Line 8.*** | Line 7:<br><br>RES-3 (Residential - 3 du/ga):<br>3 du/ga per Acre<br><br>RES-9 (Residential - 9 du/ga):<br>9 du/ga per Acre<br><br>Line 8:<br><br>RES-3 (Residential - 3 du/ga):<br>120 Ecological Corridor Base Transfer Units<br><br>RES-9 (Residential - 9 du/ga):<br>270 Ecological Corridor Base Transfer Units |
| | |

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| Discussion | Spreadsheet |
|---|---|
| 6. The Ecological Corridor awards a 25 percent density bonus. Multiply the Ecological Corridor Base Transfer Units in each FLU Classification x 0.25. This results in the Ecological Corridor Bonus Transfer Units for each FLU Classification.<br><br>***In our case,***<br><br>***120 x 0.25 = 30 Ecological Corridor Bonus Transfer Units in RES-3***<br><br>***270 x 0.25 = 67.5 Ecological Corridor Bonus Transfer Units in RES-9*** | Line 9:<br><br>RES-3 (Residential - 3 du/ga):<br>30 Ecological Corridor Bonus Transfer Units<br><br>RES-9 (Residential - 9 du/ga):<br>67.5 Ecological Corridor Bonus Transfer Units |
| | |
| 7. In each FLU Classification, add the Ecological Corridor Bonus Transfer Units to the Ecological Corridor Base Transfer Units. This results in the Ecological Corridor Upland Transfer Units for each FLU Classification.<br><br>***In our case, 120 + 30 = 150 Ecological Corridor Upland Transfer Units in RES-3.***<br><br>***270 + 67.5 = 337.5 units from the RES-9 (Residential - 9 du/ga) portion.*** | Line 10:<br><br>RES-3 (Residential - 3 du/ga):<br>150 Ecological Corridor Upland Transfer Units<br><br>RES-9 (Residential - 9 du/ga):<br>337.5 Ecological Corridor Upland Transfer Units |
| | |

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| Discussion | Spreadsheet |
|---|---|
| 8. Category 1 Wetlands in the Ecological Corridor award a 25 percent bonus. In each FLU Classification, multiply the Ecological Corridor Category 1 wetland acres by 0.25 by the FLU density.<br><br>Categories 2 and 3 wetlands in the Ecological Corridor award a 10 percent bonus. In each FLU Classification, add the Ecological Corridor Category 2 wetland acres to the Ecological Corridor Category 3 wetland acres. Multiply this number by 0.10 by the FLU density.<br><br>These calculations result in the Ecological Corridor Wetland Bonus Units for each FLU Classification.<br><br>Ecological Corridor Category 1 Acres x 0.25 x Density of FLU<br><br>plus<br><br>(CL Category 2 + CL Category 3 Acres) x 0.1 x Density of FLU<br><br>**In our case, in RES-3 (Residential - 3 du/ga), this is:**<br><br>**5 x 0.25 x 3**<br>**Plus**<br>**(2 + 3) x 0.1 x 3 = 5.25**<br><br>**In RES-9 (Residential - 9 du/ga):**<br>**20 x 0.25 x 9 = 45** | Line 11:<br><br>RES-3 (Residential - 3 du/ga):<br>5.25 Ecological Corridor Wetland Bonus Units<br><br>RES-9 (Residential - 9 du/ga):<br>45 Ecological Corridor Wetland Bonus Units |
| | |

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| Discussion | Spreadsheet |
|---|---|
| 9. For each FLU Classification, add the Ecological Corridor Upland Transfer Units in Line 10 to the Ecological Corridor Wetland Bonus Units in Line 11. This results in the Sub-Total Ecological Corridor Transfer Units, for each FLU Classification, in Line 12.<br><br>***In RES-3 (Residential - 3 du/ga), 150 Upland Transfer Units + 5.25 Wetland Bonus Units = 155.25 Sub-Total Ecological Corridor Transfer Units.***<br><br>***In RES-9 (Residential - 9 du/ga), 337.5 Upland Transfer Units + 45 Wetland Bonus Units = 382.5 Sub-Total Ecological Corridor Transfer Units*** | Line 12: Sub-Total Ecological Corridor Transfer Units<br><br>RES-3 (Residential - 3 du/ga): 155.25 Sub-Total Ecological Corridor Transfer Units<br><br>RES-9 (Residential - 9 du/ga): 382.5 Sub-Total Ecological Corridor Transfer Units |
| | |
| 10. Add the Sub-Total Ecological Corridor Transfer Units from each FLU Classification. This results in the Total Ecological Corridor Transfer Units.<br><br>***155.25 units from RES-3 (Residential - 3 du/ga) + 382.5 units from RES-9 (Residential - 9 du/ga) = 537.75***<br><br>***Round up to 538 Total Ecological Corridor Transfer Units.*** | Line 12: Total Ecological Corridor Transfer Units<br><br>538 Total Ecological Corridor Transfer Units |

*Note: Any density calculation that yields a figure greater than 0.5 shall be rounded up; less than or equal to 0.5 shall be rounded down.*

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# Example Two – Spreadsheet

| Line No. | | CON | Res-1 | Res-3 | Res-6 | Res-9 | Res-12 | Res - 24 | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **Total Developable Acres[1]** | | | 100 | | 200 | | | 300 |
| 2 | **Ecological Corridor Acres** | | | 50 | | 50 | | | 100 |
| 3 | EC Class 1 Wetland | | | 5 | | 20 | | | 25 |
| 4 | EC Class 2 Wetland | | | 2 | | 0 | | | 2 |
| 5 | EC Class 3 Wetland | | | 3 | | 0 | | | 3 |
| 6 | ***Ecological Corridor Upland Acre*** | 0 | 0 | 40 | 0 | 30 | 0 | 0 | 70 |
| 7 | ***Density*** | **0** | **1** | **3** | **6** | **9** | **12** | **24** | |
| 8 | ***EC Base Transfer*** | **0** | **0** | **120** | **0** | **270** | **0** | **0** | 390 |
| 9 | ***EC Bonus Transfer*** | **0** | **0** | **30** | **0** | **67.5** | **0** | **0** | 97.5 |
| 10 | ***EC Upland Transfer*** | **0** | **0** | **150** | **0** | **337.5** | **0** | **0** | 487.5 |
| 11 | ***Wetland Bonus*** | **0** | **0** | **5.25** | **0** | **45** | **0** | **0** | 50.25 |
| 12 | ***Total Transfer from EC*** | **0** | **0** | **155.25** | **0** | **382.5** | **0** | **0** | **538** |

*Notes: [1] Total Developable Acres shall mean that portion of the total site that can be developed for uses inclusive of street and utilitiy rights-of-way, parks, community facilities, etc. but does not include any acreage classified as wetlands, conservation lands, or water bodies.*
*[2] Any density calculation that yields a figure greater than .5 shall be rounded up; less than or equal to .5 shall be rounded down.*

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## Special Information About Intensity Transfers

Density refers to dwelling units; intensity to nonresidential square feet. While most transfers are anticipated to be density transfers, it is possible to transfer intensity. Also, density may be converted to intensity. Conversion of density to intensity is based on the number of trips generated using the most up-to-date Institute of Transportation Engineers Trip Rates. The following examples illustrate conversions from residential to nonresidential for the previous examples.

### Example One

**Step 1: Convert Dwelling Units to Trips**

The first step is converting the residential units to trips. Assuming, each residential unit generates 1.01 trips in the PM Peak Hour.

155 units x 1.01 trips/du = 156.55 trips available for transfer.

**Step 2: Convert Residential Trips to Nonresidential Trips**

Our second step is converting residential trips to nonresidential trips. We need to know the use proposed and the trips per 1,000 square feet.

We want to construct a Research and Development Center. Assuming it generates 1.07 trips per 1,000 square feet in the PM Peak Hour.

To convert the residential trips to nonresidential trips, you divide the trips available for transfer by the trips per 1,000 square feet of the use you want to establish. In this case:

156.55 total residential trips/1.07 trips = 146.31

**Step 3: Square Feet Available for Transfer**

The last step is multiplying the trips by 1,000 to get the total square feet available for transfer.

146.31 trips x 1000 = 146,310 square feet available for transfer

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**Example Two**

**Step 1: Convert Dwelling Units to Trips**

The first step is converting the residential units to trips. Each residential unit generates 1.01 trips in the PM Peak Hour.

538 units x 1.01 trips/du = 543.38 trips available for transfer

**Step 2: Convert Residential Trips to Nonresidential Trips**

Our second step is converting residential trips to nonresidential trips. We need to know the use proposed and the trips per 1000 square feet.

We want to construct a Research and Development Center. It generates 1.07 trips per 1,000 square feet in the PM Peak Hour.

To convert the residential trips to nonresidential trips, you divide the trips available for transfer by the trips per 1,000 square feet of the use you want to establish. In this case:

543.38 total residential trips/1.07 trips = 507.83

**Step 3: Square Feet Available for Transfer**

The last step is multiplying the trips by 1,000 to get the total square footage available for transfer.

507.83 trips x 1,000 square feet = 507,830 square feet available for transfer

**End of Section 3**

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## Section 4 - Conservation Easements

A conservation easement is a perpetual, undivided interest in property that is created in a variety of ways. It may be created through a voluntary, legal agreement between a private landowner and a County government agency, and is designed to conserve open space, water recharge areas, environmentally sensitive lands, wildlife habitat on a specific parcel of land. Conservation easements are recorded in the public records of the County. Conservation easements give the County certain, specific rights to the property, but do not grant outright land ownership to the County. Through the easement, the landowner retains title to the land but gives up certain rights or uses. The restrictions imposed by the easement document safeguard the land by prohibiting the construction of buildings or other structures, excavating soil, or removing or destroying trees or native vegetation.

Conservation easements are perpetual. They are transferred with the land from owner to owner when the property is sold and remain enforceable after the issuance of a tax deed. The landowner can either donate the easement or be paid for it. Easements may be specifically tailored to meet the needs of both the landowner and the County. The landowner retains fee ownership of the land and all rights associated with the property not specifically relinquished in the conservation easement. Any use that does not conflict with the purpose and terms of the easement is permissible, including selling the land and bequeathing it by will. The landowner's responsibilities include those specified in the easement. The payment of property taxes is still the responsibility of the landowner, but a reduction in that amount is one of the permissible tax benefits available to landowners.

The County has the right to make sure the conditions defined in the conservation easement are followed. The County has the right to access the land for inspections of other reasons established in the terms and conditions of the conservation easement document. If the terms of the easement are violated, the County has the right to seek enforcement remedies. Conservation easements can enable landowners to protect the properties resourced for future generations, while allowing land uses such as ranching and timber production to continue. The resulting partnerships can allow landowners to achieve the goal of retaining their land in conserving land use in the face of development pressures and economic burdens. Landowners may also receive certain tax advantages for entering into a conservation easement.

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Each conservation easement is determined individually and easements often differ. Typical elements of an easement are: rights of the grantor – to own, use, access, or live on the property; rights of the grantee – to access or inspect the property, indemnification, and the right of first refusal to purchase the property; responsibilities of the grantor – to pay taxes, assume liability, prevent damage, control exotic species, protect natural, cultural, historic and archaeological resources, and maintain buildings, structures and improvements; rights negotiated between the parties – homes, hunting, fishing, restoration, public access, timber harvest, passive recreation, cattle and agricultural operations, and pesticide, herbicide and fertilizer use; and prohibited activities – mining, dumping, excavation, subdivision, construction.

The following are links to sample conservation easements.

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**End of Section 4**

## Section 5 - Environmental Management Plan

Section 804 of the LDC requires an Environmental Management Plan (EMP). Any EMP submitted shall follow the sample form as provided in this section and shall include all of the information specified in a complete and thorough fashion.

### ENVIRONMENTAL MANAGEMENT PLAN
### OUTLINE

**1.0 GENERAL INFORMATION**

1.1 Location
- 1.1.1 Location Map with Local Streets

1.2 Purpose and Objectives
- 1.2.1 Site History - Prior Land Use
- 1.2.2 Acquisition Information
- 1.2.3 Management Objectives

**2.0 NATURAL RESOURCES**

2.1 Land Use Cover
- 2.1.1 Land Use Cover Descriptions & Acreage

2.2 Soil Resources
- 2.2.1 Soils Descriptions & Acreage

2.3 Natural Communities
- 2.3.1 Mapping Methodology and Terminology
  - Natural Communities Map
- 2.3.2 Community Descriptions and Conditions
- 2.3.3 Inventory of the Natural Communities

2.4 Preservation of Native Vegetation

2.5 Wildlife Resources
- 2.5.1 Information from the USFWS or FFWCC (as Appropriate)
  - Map of Species Occurrence Locations

2.6 Protected Species Account
- 2.6.1 Information from the USFWS or FFWCC (as Appropriate)
  - Map of Significant Areas
- 2.6.2 Species and Management Measures per Species

2.7 Feral Animal Program

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2.8 Water Resources

2.8.1 Existing Conditions

Map of Significant Areas, as Applicable

2.8.2 Compliance with the Watershed Management Plan

2.8.3 Wetlands, Springs, and Buffers Protection

2.8.4 Wetland Creation. Preservation, Enhancement, and Restoration Plans, if Applicable (Include a Description in the Body of the EMP; Actual Permit as an Appendix)

2.8.5 Stormwater Control and Treatment Systems (Include a Description in the Body of the EMP; Actual Plan as an Appendix)

2.8.6 Wastewater Collection Plan (Include a Description in the Body of the EMP; Actual Plan as an Appendix)

2.8.7 Wellhead Protection

**3.0 CULTURAL RESOURCES**

3.1 Resource Descriptions, as Applicable

Historical Aerial (1940 or Oldest Available) with any Known Sites

3.2 Management and Protection; Surveys Needed

**4.0 RECREATIONAL RESOURCES**

4.1 Existing Conditions

Map of Trails, Access Points, Points of Interest

4.2 Proposed New or Upgraded trails, access or points of interest

**5.0 SITE DEVELOPMENT AND IMPROVEMENT**

5.1 Proposed Physical Improvements

5.3 Stormwater Facilities

5.4 Hazard Mitigation

5.5 Permits

**6.0 RESOURCE MANAGEMENT**

6.1 Proposed Management Activities and Schedule

6.2 Range Management/Grazing Plan, If Applicable

6.2.1 Nutrient Management

6.2.2 Alternative Cattle Water Sources

6.2.3 Prescribed Grazing

6.2.4 Fence Installation

6.2.5 High Intensity Areas

6.2.6 Animal Mortality

6.2.7 Hay Operation

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6.3 Site Security
Inspections, Fencing, Signage, Etc.

6.4 Invasive Exotic Species Management
6.4.1 Invasive Exotic Plant Management
6.4.2 Maps of Infestations
6.4.3 Invasive Exotic Animal Management

6.5 Prescribed Burns, if Applicable

6.5.1 Explanation of Burn Plan and Coordination with the Division of Forestry Plan to Install Fire Breaks Along the Perimeter
6.5.2 Map of Burn Units

6.6 Educational and Information Signage
6.7 Integrated Pest Management and Pharmaceuticals

**7.0 RESTORATION**

7.1 Restoration Plan, as Appropriate

7.2 Map of Proposed Restoration Activities Including Acreage of Upland and Wetland Components

**8.0 COMPLIANCE**

8.1 Ecological Corridor and Wetland Ordinances

8.2 Compliance with the Comprehensive Plan
8.2.1 Current Land Use Map
8.2.2 Future Land Use Map

8.3 Provide Financial Assurance
8.4 Monitoring and Reporting

**9.0 SUMMARY OF MANAGEMENT GOALS AND OBJECTIVES**

9.1 Prioritization of Projects

9.2 Cost Estimates (Funded or not Funded)

9.3 Proposed Schedule of Implementation and Responsible Parties

**10.0 REFERENCES**

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**APPENDICES (as Applicable)**:

- Legal Documents, Including Leases, Easements, Legal Descriptions, Executed Agreements
- Comprehensive Species List
- Wetland Mitigation Permit
- Stormwater Control and Treatment Plan
- Wastewater Collection plan
- Burn Plan
- BMPs for grazing or Other Land Use, If Appropriate
- Sample Signage for Conservation Area Protection

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**End of Section 5**

## Section 6

## Proposed Ecological Corridor Modification Site Scoring Sheet

**Introduction**

The purpose of this section is to provide a formal methodology whereby a property owner and their consultants may propose an alternative alignment to the Pasco County Ecological Corridors under LDC Section 804.7.C.4. The "Ecological Corridor Site Evaluation Score Sheet" is similar to the evaluation sheet used by the Environmental Lands Acquisition and Management Program to determine the natural resource value of lands nominated for acquisition. It has proven successful in determining the characteristics of lands resulting in both recommendations for acquisition and recommendations for excluding property from the ELAMP.

There are eight (8) lead criteria used to cumulatively assess the quality of the lands being considered. Some of these criteria have with additional sub-categories:

1) Natural Linkages
2) Natural Community
3) Floral and Faunal Functions
4) Water Resources/Wetlands
5) Aquifer Recharge
6) Unique Geological Resources
7) Long-term Management Requirements, and;
8) Restoration Needs

The use of these assessment criteria must be based on an evaluation conducted by a professionally qualified and experienced biologist or ecologist. The scoring methodology is based upon generally accepted, theoretical and experiential science; relying on published and peer-reviewed studies. The evaluative statements are based on the published scientific information employed in the original Ecological Corridor study and new information and studies as they have become available.

All qualitative and quantitative scoring shall be based on the professional judgment of the evaluator and supported by published, peer-reviewed scientific papers and other suitable scientifically supported resources. The validity of the scoring exercise shall be established by

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citation and bibliography; not merely the opinion of the evaluator based on "years of experience". New information, studies, and published scientific papers which support the Applicants' determinations in deference to the existing corridor alignments must be provided as justification for the professional opinions of the evaluator.

**Natural Linkages**

Connectivity

The fundamental concept for acquisition of preservation lands in the County is to create connectivity between existing publically owned lands by establishing landscape-scale wildlife corridors or "Ecological Corridors". Therefore, the program identified Ecological Corridor alignments that are continuous from one core public land location to another resulting in the identification of seven (7) Ecological Corridors. The value of a corridors connectivity provides for an evaluation of the parcels ability to facilitate movement (i.e. daily, seasonal, generational and dispersal movements) and act as secondary habitat required for the continued existence of plants, animals and their genetic material. This component establishes the level of function needed to maintain viable and successive generations of all scales of plants, wildlife, and their respective habitats. A score of 1 to 5 is used to apply a numeric value to the actual connectivity provided by a portion of adjacent private lands as they relate to the identified Ecological Corridor and its outer boundaries.

Matrix Score = 1, Very isolated from existing preserve or Ecological Corridor by a distance determined to exceed most daily movements of species expected to utilize connection; complete physical barrier (i.e. major roadways, densely developed areas) to wildlife movement exists between preserved lands or Ecological Corridor.

Matrix Score = 2, isolated from existing preserve or Ecological Corridor by a distance determined to be within the maximum daily movements of species expected to utilize connection; strong barriers to wildlife movement exists between preserve lands or Ecological Corridor, but some of the expected species able to make successful crossing at connection.

Matrix Score = 3, Land within distance of most expected species daily movement patterns; moderate barriers to wildlife movement exists between preserve lands or

Ecological Corridors, but most expected species are able to make successful crossing at connection.

Matrix Score = 4, Shares much of its boundary with existing preserve or Ecological Corridor; minor to no barriers exist to wildlife movement, those that do exist occur only seasonally such as flooding events.

Matrix Score = 5, directly connects to existing preserve or Ecological Corridor; no barriers exist to wildlife movement.

Value of Buffering

The value of buffering is a method by which any particular parcel can be quantified for its ability to protect, enhance, and manage as well as to provide access to the Ecological Corridors. It is irrelevant whether the parcel in question is in a natural, semi-natural, or degraded state. A score of 1 to 5 is assigned to establish a numeric value based on the width, perpendicular to the edge of the preserve or Ecological Corridor, to determine the buffering potential for any particular parcel. This scoring is primarily based on the parcel's ability to add an additional layer of protection to the preserve or Ecological Corridor from future primary and secondary anthropogenic disturbances. Other factors such as increasing access for management purposes shall be considered.

Matrix Score = 1, Provides no additional protection to existing preserve or Ecological Corridor (< 50 feet).

Matrix Score = 2, Provides minor additional protection to existing preserve or Ecological Corridor (≤250 feet).

Matrix Score = 3, Provides moderate additional protection to existing preserve or Ecological Corridor (>250 feet); Includes limited access assisting in management practices.

Matrix Score = 4, Provides excellent additional protection to existing preserve or Ecological Corridor (≥500 feet); Includes secondary access option for assisting in management practices.



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Matrix Score = 5, Provides significant additional protection to existing preserve or Ecological Corridor (≥1000 feet); Provides only access option for management practices.

Habitat Fragmentation and Patchiness

Fragmentation of habitat is a major factor in the decline of both plant and animal species and populations. Habitat fragmentation occurs when impacts break intact, continuous habitat into smaller areas, called patches. As the network of impacts grows, the network of patches shrinks. Larger patches and a larger network of patches sustain a greater number of species, habitats and populations. Protected species are especially sensitive to habitat fragmentation, because they are either habitat specialists, require extensive habitat, or require multiple habitats; populations whose habitat has become too fragmented are more vulnerable to extinction. For the purpose of the ELAMP, a patch shall include all acreage in the project nomination. For development application purposes, a patch shall include all acreage within the project boundary and the Ecological Corridor. If a patch shares a boundary with a conservation land, the area scoring shall be based on the contiguous area, not the area of the patch.

| | |
|---|---|
| Matrix Score = 1 | Patch ≤10 acres |
| Matrix Score = 2 | Patch 10-25 acres |
| Matrix Score = 3 | Patch 26-50 acres |
| Matrix Score = 4 | Patch 51-100 acres |
| Matrix Score = 5 | Patch >100 acres |

Edge Effect

Edge effect is the negative impact of exterior conditions on interior species, habitat and populations. When a patch has a large amount of edge, it exposes the patch to greater perforation and permeability of non-habitat conditions, such as light, noise, disease, parasites, predators, pollutants, pathogens, temperature and exotic species. Small patches, with more edge for a given area, experience proportionately greater negative effects than large patches. The number of species and health of populations are maximized when patches are large and compact, providing abundant interior areas, free from the impacts of edges. The simplest method to calculate edge effect is to determine the ratio of edge to area.

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*If the perimeter of a subject patch is <15% contiguous with an adjacent conservation land, calculate edge:area by measuring the patch alone.*

*If the perimeter of a subject patch is ≥15% contiguous with an adjacent conservation land, calculate edge:area by measuring the patch + the conservation land, together as one piece.*

| | |
|---|---|
| Matrix Score = 1 | Edge:area ≥ 0.0063 |
| Matrix Score = 2 | Edge:area 0.0049 – 0.0062 |
| Matrix Score = 3 | Edge:area 0.0035 - 0.0048 |
| Matrix Score = 4 | Edge:area 0.0021 – 0.0034 |
| Matrix Score = 5 | Edge:area ≤ 0.0020 |

**Natural Community**

Habitat Quality

The assessment of overall wildlife habitat quality to determine environmentally sensitive lands includes an evaluation of many factors such as, landscape diversity, proximity to public lands, documented protected species locations, and species richness. FFWCC Integrated Wildlife Habitat Ranking System (IWHRS) includes these factors as well as several others that assess the habitat needs of wildlife to identify ecologically significant lands. A score of 1 to 5 is assigned to parcels to represent a numeric quantification of the habitat quality as it is represented by existing conditions as well as the use of IWHRS.

Matrix Score =1, Very low habitat quality; IWHRS Class 1 & 2

Matrix Score =2, Low habitat quality; IWHRS Class 3 & 4

Matrix Score =3, Moderate habitat quality; IWHRS Class 5 & 6

Matrix Score =4, High habitat quality; IWHRS Class 7 & 8

Matrix Score =5, Very high habitat quality; IWHRS Class 9 & 10

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Disturbance

The level of disturbance is a measure of the level of habitat alteration or disturbance as well as the presence of structured natural communities and their components to include canopy, mid-story, and groundcover. Even in altered environments, components of the original communities may still be apparent. The 2007 Florida Scientist article Florida Vegetation 2003 and Land Use Change Between 1985–89 shows that sixteen (16) non-natural or disturbed communities occur in Pasco County. A score of 1 to 5 is assigned to reflect both the quality and existence of natural, native species balanced with the impacts from existing land use and land management practices.

Matrix Score = 1, Very low quality; 80-100% disturbed; no presence of natural plant community and lacking most or all components.

Matrix Score = 2, Low quality; 50-80% disturbed; little presence of natural plant community and lacking most components

Matrix Score = 3, Moderate quality; 30-50% disturbed; presence of natural plant community with all components in need of enhancement or restoration.

Matrix Score = 4, High quality; 10-30% disturbed; relatively unaltered natural plant community with no more than one component in need of enhancement or restoration.

Matrix Score = 5, Very high quality; 0-10% disturbed; minimally unaltered natural plant community with all components intact.

Community Rarity

The measure of community rarity addresses specific habitat types in a range of presence from universally present to extremely rare or imperiled. A value between 1 and 5 shall be based on the Florida Natural Areas Inventory (FNAI), state ranking or other authoritative source (i.e., the Florida Fish & Wildlife Conservation Commission (FF&WCC), or the US Department of the Interior, U.S. Fish & Wildlife Service (USF&WS) as appropriate

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Matrix = 1, ubiquitous habitat type(s); FNAI State Rank is SNA

Matrix = 2, very common habitat type(s); FNAI State Rank is S5

Matrix = 3, common habitat type(s); FNAI State Rank is S4

Matrix = 4, rare habitat type(s); FNAI State Rank is S3

Matrix = 5, very rare or critically imperiled habitat type(s); FNAI State Rank is S2 or S1

**Floral and Faunal Functions**

Biodiversity

Floral and faunal functions assess the ecological diversity of the plant and animal species either anticipated or documented to prefer specific habitat types based on characteristic soils, the type and number of different plant communities, their estimated extent and relative abundance. The prediction of the potential for greater diversity, based upon direct observation as well as the use of FFWCC Biodiversity Resource Category Priorities used in Critical Lands and Waters Identification Project (CLIP) may be input into the determination of the relative ecological diversity of the area and assigned a value of between 1 and 5 on the score sheet.

Matrix = 1, very low diversity; FWC Biodiversity Resource Category Priority 5

Matrix = 2, low diversity; FWC Biodiversity Resource Category Priority 4

Matrix = 3, moderate diversity; FWC Biodiversity Resource Category Priority 3

Matrix = 4, high diversity; FWC Biodiversity Resource Category Priority 2

Matrix = 5, very high diversity; FWC Biodiversity Resource Category Priority 1

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Exotic/undesirable species presence

The measure of exotic/undesirable species presence determines the level of effort required to restore or enhance the recovery of the natural communities, a priority management goal for the Ecological Corridors. The quantification of the presence and relative abundance of exotic or nuisance species is a common exercise in the evaluation of the resource value of lands being considered for preservation.

For this section, the evaluation scores should be based on a valid estimate of the percentages of exotics and undesirable species present. Pasturelands, plantations, and degradation of the ecotone transition area by climbing vines (wild grape, air potato, skunk vine, etc.), commonly referred to as the "edge", should not be scored low if there are remnant natural community species present.

A valid estimate based on a percentage (coverage) of each specific exotic and invasive species observed as well as the use of the "Florida Exotic Pest Plant Council" (FLEPPC) for listed Class I exotic and nuisance species. Based on this assessment a numeric value of between 1 and 5 can be assigned. Percent cover will be determined by field evaluation using best available scientific methods.

Matrix Score = 1, Percent coverage of exotics/undesirable species greater than 75% of the area; more than (3) FLEPPC Class I listed species

Matrix Score = 2, Percent coverage of exotics/undesirable species between 25-75% of the area; more than (2) FLEPPC Class I listed species

Matrix Score = 3, Percent coverage of exotics/undesirable species between 15-25% of the area; less than 2 FLEPPC Class I listed species

Matrix Score = 4, Percent coverage of exotics/undesirable species between 5-15% of the area; less than (1) FLEPPC Class I listed species

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Matrix Score= 5, Percent coverage of exotic/undesirable species between 0-5% of the area; no FLEPPC Class I listed species present

Protected and Imperiled species presence

The protected species presence or potential is the evaluation of habitats and the matrix of these habitats to determine the overall suitability of the subject land to support imperiled and protected plant and wildlife species, particularly Federal and State protected species. For many imperiled and protected species, it is the core areas of the habitats within the Ecological Corridor or existing preserve that provides the necessary cover, security and niche for these plants and animals. The presence of food sources, areas for nesting and denning, topography and seclusion, percentage of canopy and understory species all play an important role in potential for occurrence of protected plants and animals. A scoring of 1 to 5 should be based upon FNAI, FFWCC (i.e. Rare Species Habitat Conservation Priorities used in CLIP) and USFWS informational databases and publications as well as the direct observation of individuals to establish a valid numeric score.

Matrix = 1, habitat not expected to support protected or rare species; no protected or rare species present or expected to occur; FNAI State Rank 1

Matrix = 2, habitat not likely to support many protected or rare species; very few protected species present or expected to occur; FNAI State Rank 2

Matrix = 3; habitat likely to support some protected or rare species; moderate number protected species present or expected to occur; FNAI State Rank 3

Matrix = 4, habitat very likely to support several protected or rare species; several protected species present or expected to occur; FNAI State Rank 4

Matrix = 5, rare habitat very likely to support numerous protected or rare species; numerous protected species present or expected to occur; FNAI State Rank 5

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**Water Resources/Wetlands**

If it seems that wetlands are everywhere in Pasco County, it is because they are everywhere. In many cases the percentage of Federal and State Jurisdictional wetlands on larger acreages can approach or exceed 50%. Within the proposed Ecological Corridors, this percentage approaches 80%. The alignment of the Ecological Corridors was established primarily over riverine wetlands and the upper reaches of their watersheds. This allowed for focus on the preservation of lands which already possessed a degree of regulatory protection.

Much of the acreages adjacent to the Ecological Corridors have been historically used and managed for agriculture, including open range cattle grazing, hay production and citrus crops, although there has been residential and commercial development in some of these areas. Past agricultural management practices, as well as the withdrawal of millions of gallons of drinking water supplies to serve the region on a daily basis, has resulted in degradation of many of the wetland systems that remain within the County. Development has also played a role in wetland degradation, isolation of wetland systems, changes in hydro-period and the resulting changes in the plant and animal communities within them. Scoring from 1 to 5 for the wetland systems within and adjacent to the Ecological Corridor Boundary is based on the state Uniform Mitigation Assessment Method Section 62-345.500 Assessment and Scoring-Part II, 6. Water Environment.

Matrix Score = 1, very degraded wetlands; means that the hydrology and water quality does not support the expected functions; UMAM Water Environment score between 0-2.

Matrix Score = 2, degraded wetlands; means that the hydrology and water quality supports the functions and provides benefits at ≤ 40% of the optimal capacity; UMAM Water Environment score between 3-4.

Matrix Score = 3, slightly degraded wetlands; means that the hydrology and water quality supports several functions and provides benefits between 40-70% of the optimal capacity; UMAM Water Environment score between 5-6.

Matrix Score = 4, high quality wetlands; means that the hydrology and water quality supports most all the functions and provides benefits between 70-90% of the optimal capacity; UMAM Water Environment score between 7-8.



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Matrix Score = 5, very high quality wetlands, near pristine; means that the hydrology and water quality supports all the functions and provides benefits between ≥ 90% of the optimal capacity; UMAM Water Environment score between 9-10.

**Adequate Buffer to the Wetlands**

As previously stated, the alignment of the Ecological Corridors was prioritized to follow the existing riverine and water based resources of the County. In the evaluation of the inclusion or exclusion of wetland systems, the availability of adequate buffering for these systems was a determining factor in establishing the boundaries of the corridors. Exclusive of all other considerations, the average upland buffer width, perpendicular to the wetland line, was used to determine the value of adjacent wetland systems for inclusion in the boundary. Scoring from 1 to 5 is simply based on the available buffer in lineal footage of 100-500 feet. A score of 1.5 therefore indicates an available buffer of 150 feet. Available buffer of 500 feet or more is scored as 5.0.

Matrix Score = 1, provides 100' buffer

Matrix Score = 2, provides 200' buffer

Matrix Score = 3, provides 300' buffer

Matrix Score = 4, provides 400' buffer

Matrix Score = 5, provides 500' buffer

**Aquifer Recharge**

Aquifer recharge is the process in which ground water is replenished. This is achieved through an aquifer recharge area where water is transmitted downward into the aquifer. The effectiveness of an area to serve as recharge is dependent upon certain physical characteristics including vegetative cover, slope, soil types and their respective properties, depth to water table and the presence or non-presence of a geological confining or impermeable layer. Scoring from



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1 to 5 will be based on the subject land's rating of aquifer recharge value, as measured by the Ground Water Resource Category used in CLIP.

Matrix Score = 1, little value as aquifer recharge; recharge value - CLIP Priority 6

Matrix Score = 2, good value as aquifer recharge; recharge value between - CLIP Priority 5

Matrix Score = 3, excellent value as aquifer recharge; recharge value between - CLIP Priority 3 & 4

Matrix Score = 4, significant value as aquifer recharge; recharge value between - CLIP Priority 2

Matrix Score = 5, significant value as aquifer recharge; recharge value - CLIP Priority 1

**Unique Geologic Resources**

Florida has a unique geologic history that began over 40 million years ago. The Florida peninsula is mainly comprised of the fossilized remains of sea animals deposited as the sea rose and fell. As the seas continued to drop, the peninsula remained exposed, creating a layer of limestone bedrock. This process created a karst topography that is found in only a select few locations across the world. Such features found in Florida include caverns and caves, disappearing rivers, flowing springs, sinkholes, circular lakes and subsurface aquifers. Karst features provide habitat for numerous native species as well as providing a stable source of drinking water. A score of 1 to 5 evaluating a site's unique geologic resources shall be based on the presence, condition, and significance of the resource found onsite.

Matrix Score = 1, no unique features

Matrix Score = 2, unique features expected to occur, but none documented

Matrix Score = 3, unique features present, but in degraded condition

Matrix Score = 4, unique features present, showing minimal degradation

Matrix Score = 5, significant unique features present in pristine condition

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## Long-Term Management Requirements

Management potential

Regardless of the mechanism used to preserve environmentally sensitive lands, Pasco County has committed to protecting and ensuring proper use of such lands. Protection involves maintaining appropriate hydrological characteristics and functions, removing or eradicating exotic plant and animal species, and preserving the biological and ecological processes of these lands. These goals are achieved through the implementation of site-specific management plans; however, not all sites exhibit the same management potential. Variability in location, size, habitat types, access, and proximity to development and roads that restrict management techniques, such as prescribed fire, all contribute to a site's potential to be managed effectively. A score of 1 to 5 evaluating a land's management potential shall be used based on a site's vulnerability to secondary anthropogenic impacts, size, access, and proximity to land uses restricting management.

Matrix Score = 1, impossible; no management access, completely isolated by restrictive land uses, size and configuration not conducive to withstand secondary impacts, very high potential for human-related impacts

Matrix Score = 2, difficult; extremely limited seasonal management access, isolated by restrictive land uses; size and configuration a minor factor, high potential for human-related impacts

Matrix Score = 3, moderate; singular management access; adjacent to restrictive land uses; size and configuration not a factor, moderate potential for human related impacts

Matrix Score = 4, good; multiple management accesses; near but not abutting restrictive land uses; size and configuration adds to effective management, low potential for human related impacts

Matrix Score = 5, excellent; multiple management accesses; no restrictive land uses; size and configuration allows for effective management, very low potential for human related impacts

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Restoration Needs

Not all lands identified on the Ecological Corridors Map are comprised of natural vegetative communities. Some have been degraded, altered, or effectively destroyed, directly or indirectly, by anthropogenic activities. In these cases, ecological restoration -- the process of restoring an ecosystem to its natural historical state -- may be required. Varying levels or degrees of restoration needs may be necessary to achieve this goal. These levels of restoration will be predicated on the amount of disturbance observed. A score of 1 to 5 based on the scale, cost, extent of disturbance, type of restoration (wetland/upland) and risk of success all contribute to a land's restoration needs and difficulty.

Matrix Score = 1, restoration needs very high; land needs to be completely restored; cost prohibitive

Matrix Score = 2, needs high; large percent of land needs to be restored; extremely expensive, success uncertain (upland)

Matrix Score = 3, moderate needs; at least half the land needs to be restored; average expense; reasonable to achieve at least 50% chance of success

Matrix Score = 4, low need; less than ¼ of the land needs to be restored; low expense; reasonable to achieve at least 75% success

**Matrix Score = 5, extremely low need; less than 10% of the land needs to be restored; minimal expense; reasonable to achieve >75% success**

**End of Section 6**



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**EXHIBIT 1**

**PROPOSED ECOLOGICAL CORRIDOR MODIFICATION - SITE SCORING SHEET**

Site Name: _____

Site Location: _____

Reviewer's Name: _____ Date: _____

| CRITERIA | SCORE | ENTER SCORE AND COMMENTS |
|---|---|---|
| **1. Natural Linkages** | | |
| | | |
| **a. Connectivity** | | |
| • Very isolated from existing preserve or Ecological Corridor by a distance determined to exceed most daily movements of species expected to utilize connection; complete physical barrier (i.e. major roadways, densely developed areas) to wildlife movement exists between preserved lands or Ecological Corridor | 1 | |

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| • Isolated from existing preserve or Ecological Corridor by a distance determined to be within the maximum daily movements of species expected to utilize connection; strong barriers to wildlife movement exists between preserve lands or Ecological Corridor, but some of the expected species able to make successful crossing at connection | 2 | |
| • Land within distance of most expected species daily movement patterns; Moderate barriers to wildlife movement exists between preserve lands or Ecological Corridors, but most expected species are able to make successful crossing at connection | 3 | |
| • Shares much of its boundary with existing preserve or Ecological Corridor; Minor to no barriers exist to wildlife movement, those that do exist occur only seasonally, such as flooding events | 4 | |
| • Directly connects to existing preserve or Ecological Corridor; no barriers exist to wildlife movement. | 5 | |
| | | |
| **b. Value of Buffering** | | |
| • Provides no additional protection to existing preserve or Ecological Corridor (< 50 feet). | 1 | |

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| • Provides minor additional protection to existing preserve or Ecological Corridor (≤150 feet). | 2 | |
| • Provides moderate additional protection to existing preserve or Ecological Corridor (>250 feet); Includes limited access assisting in management practices. | 3 | |
| • Provides excellent additional protection to existing preserve or Ecological Corridor (≥500 feet); Includes secondary access option for assisting in management practices. | 4 | |
| • Provides significant additional protection to existing preserve or Ecological Corridor (≥1000 feet); Provides only access option for management practices. | 5 | |
| | | |
| **c. Habitat Fragmentation and Patchiness** | | |
| • Parcel ≤10 acres | 1 | |
| • Parcel 10-25 acres | 2 | |
| • Parcel 26-50 acres | 3 | |
| • Parcel 51-100 acres | 4 | |
| • Parcel >100 acres | 5 | |
| | | |
| **d. Edge Effect** | | |
| • Edge:area ≥ 0.0063 | 1 | |
| • Edge:area 0.0049 – 0.0062 | 2 | |
| • Edge:area 0.0035 - 0.0048 | 3 | |
| • Edge:area 0.0021 – 0.0034 | 4 | |

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|---|---|---|
| • Edge:area ≤ 0.0020 | 5 | |
| | | |
| **2. Natural Community** | | |
| | | |
| **a. Habitat Quality** | | |
| • Very low habitat quality; IWHRS Class 1 & 2 | 1 | |
| • Low habitat quality; IWHRS Class 3 & 4 | 2 | |
| • Moderate habitat quality; IWHRS Class 5 & 6 | 3 | |
| • High habitat quality; IWHRS Class 7 & 8 | 4 | |
| • Very high habitat quality; IWHRS Class 9 & 10 | 5 | |
| | | |
| **b. Disturbance** | | |
| • Very low quality; 80-100% disturbed; no presence of natural plant community and lacking most or all components | 1 | |
| • Low quality; 50-80% disturbed; little presence of natural plant community and lacking most components | 2 | |
| • Moderate quality; 30-50% disturbed; presence of natural plant community with all components in need of enhancement or restoration | 3 | |
| • High quality; 10-30% disturbed; relatively unaltered natural plant community with no more than one component in need of enhancement or restoration. | 4 | |

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| • Very high quality; 0-10% disturbed; minimally unaltered natural plant community with all components intact | 5 | |
| | | |
| **c. Community Rarity** | | |
| • ubiquitous habitat type(s); FNAI State Rank is SNA | 1 | |
| • very common habitat type(s); FNAI State Rank is S5 | 2 | |
| • common habitat type(s); FNAI State Rank is S4 | 3 | |
| • rare habitat type(s); FNAI State Rank is S3 | 4 | |
| • very rare or critically imperiled habitat type(s); FNAI State Rank is S2 or S1 | 5 | |
| **3. Floral and Faunal Functions** | | |
| | | |
| **a. Biodiversity** | | |
| • very low diversity; FWC Biodiversity Resource Category Priority 5 | 1 | |
| • low diversity; FWC Biodiversity Resource Category Priority 4 | 2 | |
| • moderate diversity; FWC FWC Biodiversity Resource Category Priority 3 | 3 | |
| • high diversity; FWC FWC Biodiversity Resource Category Priority 2 | 4 | |
| • very high diversity; FWC FWC Biodiversity Resource Category Priority 1 | 5 | |
| | | |
| **b. Exotic/Undesirable Species Presence** | | |

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|---|---|---|
| • Percent coverage of exotics greater than 75% of the area; more than (3) FLEPPC Class I listed species | 1 | |
| • Percent coverage of exotics between 25-75% of the area; more than (2) FLEPPC Class I listed species | 2 | |
| • Percent coverage of exotics between 15-25% of the area; less than 2 FLEPPC Class I listed species | 3 | |
| • Percent coverage of exotics between 5-15% of the area; less than (1) FLEPPC Class I listed species | 4 | |
| • Percent coverage of exotics between 0-5% of the area; no FLEPPC Class I listed species present | 5 | |
| | | |
| **c. Protected Species Presence** | | |
| • Habitat not expected to support protected or rare species; no protected or rare species present or expected to occur; FNAI State Rank 1 | 1 | |
| • Habitat not likely to support many protected or rare species; very few protected species present or expected to occur; FNAI State Rank 2 | 2 | |
| • Habitat likely to support some protected or rare species; moderate number protected species present or expected to occur; FNAI State Rank 3 | 3 | |

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| • Habitat very likely to support several protected or rare species; several protected species present or expected to occur; FNAI State Rank 4 | 4 | |
| • Rare habitat very likely to support numerous protected or rare species; numerous protected species present or expected to occur; FNAI 5 | 5 | |
| | | |
| **4. Water Resources/Wetlands** | | |
| | | |
| **a. Wetlands and Water Quality** | | |
| • very degraded wetlands; the hydrology and water quality does not support the expected functions; UMAM Water Environment score between 0-2 | 1 | |
| • degraded wetlands; means that the hydrology and water quality supports the functions and provides benefits at ≤ 40% of the optimal capacity; UMAM Water Environment score between 3-4 | 2 | |
| • slightly degraded wetlands; means that the hydrology and water quality supports several functions and provides benefits between 40-70% of the optimal capacity; UMAM Water Environment score between 5-6 | 3 | |

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|---|---|---|
| • high quality wetlands; means that the hydrology and water quality supports most all the functions and provides benefits between 70-90% of the optimal capacity; UMAM Water Environment score between 7-8 | 4 | |
| • very high quality wetlands, near pristine; means that the hydrology and water quality supports all the functions and provides benefits between ≥ 90% of the optimal capacity; UMAM Water Environment score between 9-10 | 5 | |
| | | |
| **b. Adequate Buffer to Wetlands** | | |
| • provides 100' buffer | 1 | |
| • provides 200' buffer | 2 | |
| • provides 300' buffer | 3 | |
| • provides 400' buffer | 4 | |
| • provides 500' buffer | 5 | |
| | | |
| **c. Aquifer Recharge** | | |
| • little value as aquifer recharge; CLIP Priority 6 | 1 | |
| • good value as aquifer recharge; CLIP Priority 5 | 2 | |
| • excellent value as aquifer recharge; CLIP Priority 3 & 4 | 3 | |
| • significant value as aquifer recharge; CLIP Priority 2 | 4 | |

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| • significant value as aquifer recharge; CLIP Priority 1 | 5 | |
| | | |
| **5. Unique Geologic Resources** | | |
| • no unique features | 1 | |
| • unique features expected to occur, but none documented | 2 | |
| • unique features present, but in degraded condition | 3 | |
| • unique features present, showing minimal degradation | 4 | |
| • significant unique features present in pristine condition | 5 | |
| | | |
| **6. Long Term Management Requirements** | | |
| | | |
| **a. Management Potential** | | |
| • impossible; no management access, completely isolated by restrictive land uses, size and configuration not conducive to withstand secondary impacts; very high potential for human-related impacts | 1 | |
| • difficult; extremely limited seasonal management access, isolated by restrictive land uses; size and configuration a minor factor; high potential for human-related impacts | 2 | |

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|---|---|---|
| • moderate; singular management access; adjacent to restrictive land uses; size and configuration not a factor; moderate potential for human-related impacts | 3 | |
| • good; multiple management access; near but not abutting restrictive land uses; size and configuration adds to effective management; low potential for human-related impacts | 4 | |
| • excellent; multiple management access; no restrictive land uses; size and configuration allows for effective management; very low potential for human-related impacts | 5 | |
| | | |
| **b. Restoration Needs** | | |
| • restoration needs very high; land needs to be completely restored; cost prohibitive | 1 | |
| • needs high; large percent of land needs to be restored; extremely expensive, success uncertain (upland) | 2 | |
| • moderate needs; at least half the land needs to be restored; average expense; reasonable to achieve at least 50% chance of success | 3 | |
| • low need; less than ¼ of the land needs to be restored; low expense; reasonable to achieve at least 75% success | 4 | |

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|---|---|---|
| • extremely low need; less than 10% of the land needs to be restore; minimal expense; reasonable to achieve at >75% success | 5 | |
| | | |
| **TOTAL SCORE** | | |

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