

**Indirect and Cumulative Effects Task Group**  
Responses to Natural Resources Sub-Group Assignment

FDOT District Five Urban Office  
Orlando, Florida

The following responses to the questions posed at the April sub-group meeting were submitted by the following agencies: US Environmental Protection Agency (EPA), US Fish & Wildlife Service (US FWS), National Marine Fisheries Service (NMFS), the Florida Department of Environmental Protection (FDEP), and the Army Corps of Engineers (ACOE).

**1. *From your perspective, how would you conduct the following elements of a cumulative effects evaluation?***

- *define the resource (e.g., specific protection species, wetland, etc.)*
- *define the assessment area (e.g., drainage basin, habitat type, etc.)*

**EPA**

Resource – the primary or “major” natural resources of interest to EPA for review of transportation projects in Florida are Air Quality, Floodplains, Water Quality, and Wetlands. As stated in the meeting on April 4 & 5, a trend analysis of a specified geographic area and the impact to resources as a result of past, current, and future changes in land use is a good way to assess cumulative impacts. The following list includes some thoughts:

- Determine the current status of the resource, both quantitatively and qualitatively.
- Assess past conditions and trends leading up to current status.
- Make reasonably foreseeable assumptions of future conditions based on past trends and anticipated future land use changes.
- Look at land use trends and changes, get historical and current land use info (such as DRIs, utilities, water/sewer) from regional planning councils, municipalities, and other local entities.
- Use measurable data such as forest coverage, agricultural lands, prime farmland, trend loss of wetlands by watershed/basin (data from COE based on permitted jurisdictional wetland acreage loss), NWI data, water quality data.
- See if COE has wetland permit data by Corps District (any such data is a must).
- Trends in water quality – 303(d) lists, 305(b) reports, STORET water quality data, TDML information (data needs may come from EPA, FDEP, or WMDs). Also look at trend analysis data which may have been collected for National Estuary Program (NEP) project areas in Florida (such as Tampa Bay, McKay Bay, Hillsborough River, Sarasota Bay, Indian River Lagoon) - may have 20-year trend analysis data on these types of areas.
- Trends and changes in floodplain areas. Measurable data such as 100-year floodplain areas being filled and developed throughout the years – percentage of development within the FEMA 100-year Flood Hazard Zones.
- Assessment Area – defining the assessment area for indirect impacts from proposed transportation projects only is much more tangible than cumulative impacts (e.g., ½ to 1 mile). Defining the assessment area for cumulative impacts is much more difficult and will

be resource specific and may differ from resource to resource. EPA offers the following suggestions for defining the assessment area for four natural resources – air quality (county or metropolitan area), floodplains (drainage basin), water quality (drainage basin), wetlands (drainage basin or watershed).

### USFWS

The U. S. Fish and Wildlife Service (Service) is responsible for regulating several federally-listed threatened or endangered species, as well as promoting the conservation of fish and wildlife resources and their habitats for the good of the American people. Therefore, I envision that we will conduct several cumulative effects analyses for each ETDM project. Cumulative analyses would likely be done for: (1) each listed species that may occur in the project area, and (2) fish and wildlife habitat in general.

To illustrate how we might conduct a cumulative effects analysis, I have chosen the threatened Florida scrub-jay (*Aphelocoma coerulescens*) as an example of a federally listed species that could potentially be adversely affected by an ETDM project. Because current detailed survey data for the scrub-jay are lacking in many areas, I would concentrate my analysis for this species on providing an estimate of potential scrub-jay habitat (*i.e.*, habitat that may currently contain scrub-jays, or habitat that could provide habitat for scrub-jays with management etc.) in the assessment area.

Florida scrub-jays usually reside in oak scrub vegetated with sand live oak (*Quercus geminata*), myrtle oak (*Q. myrtifolia*), scrub oak (*Q. inopine*), and Chapman oak (*Q. chapmanii*), along with saw palmetto (*Serenoa repens*), scrub palmetto, scattered sand pine, and rosemary. Such habitat occurs only on fine, white, drained sand, along the coastlines in Florida, and in dunes deposited during the Pleistocene, when sea levels were much higher than at present (Laessle 1958, 1968). Florida scrub-jays are rarely found in habitats with more than 50 percent canopy cover over 3 meters in height (Service 1990). The habitat required for the Florida scrub-jay greatly restricts the bird's distribution. The following Florida Land Use, Cover and Forms Classification System (FLUCCS) habitat types can be considered as potential habitat for the Florida scrub-jay: herbaceous dry prairie (310), palmetto prairie (321), coastal scrub (322), longleaf pine-xeric oak (412), sand pine (413), xeric oak (421), sand live oak (432), upland scrub, pine and hardwoods (436). To provide an estimate of potential habitat available to the scrub-jay, I would determine the total acreage of these habitat types in the assessment area that have not been developed or have been permitted to be developed. This method would overestimate the scrub-jay abundance in the assessment area because all potential habitat reported is not likely to be occupied by scrub-jays. But it is probably the best information we can provide to planning organizations due to the paucity of scrub-jay survey data.

Defining the assessment area (e.g., drainage basin, habitat type, etc.): for the Florida scrub-jay I have chosen to define two assessment areas. The first would include the county or counties where the ETDM project under review is located. As discussed in our last meeting, the county is the entity that would most likely conduct development planning on a scale that could significantly affect the conservation of the Florida scrub-jay. Moreover, a cumulative analysis at the county level will provide the county with information on potential Florida scrub-jay habitat remaining in their county.

The second assessment area for the scrub-jay would be the specific “*scrub-jay habitat compensation service area*” (as defined by the Service, Figure 1) in which the project under ETDM review is located. The Service has developed a network of scrub-jay habitat compensation areas to promote scrub-jay conservation. Suitable scrub-jay habitat within these areas can be acquired, managed, and protected by persons proposing section 7 related actions to minimize their adverse impacts to the Florida scrub-jay. Habitat compensation service areas were established based on results of a spatially-explicit population model developed for the Florida scrub-jay (Stith 1999), published metapopulation data, Geographic Information System (GIS) coverage of public lands and scrub habitat, and our knowledge of localized scrub-jay populations. Each scrub-jay habitat compensation service area: (1) contains one or more parcels of public or protected private lands that collectively have one or more scrub-jay populations anticipated to persist long-term; (2) has at least 1 population with a minimum of 10 pairs of scrub-jays; and (3) minimizes the potential for demographic fragmentation. This assessment area is important to the Service because our goal is to maintain viable scrub-jay populations within all metapopulations as represented by the habitat compensation service areas.

#### NMFS

In the case of NMFS, the resources of concern would be threatened and endangered species under the agency’s purview and essential fish habitat (EFH). Federally-listed threatened and endangered species that would be most likely to be affected by FDOT projects (principally bridges and roads) include sea turtles (6 listed species), Gulf and shortnose sturgeon, smalltooth sawfish, and Johnson’s seagrass. Also, three species of coral are presently candidate species for listing; and a number of bony and cartilaginous fishes are species of special concern along with ivory bush coral.

Essential fish habitats likely to be affected include shoreline and sub-tidal resources such as salt marsh, mangroves, seagrasses, corals, hard bottom (especially live hard bottom), and the water column itself. From NMFS perspective, assessment areas would typically be estuaries (e.g. Tampa Bay, Charlotte Harbor, Pensacola Bay, Biscayne Bay, Mosquito Lagoon), or in the Florida Keys might be the reef tract.

#### FDEP

FDEP would prefer that the FDOT/project consultants be tasked with running the appropriate data analyses, within established buffer areas, necessary to perform the actual cumulative effects evaluation (in whatever format we agree upon). This would reduce the overall resource agency staff time required and allow staff to concentrate their efforts on determining the degrees of effect and reaching reasonable conclusions. The defined resources include water quality and quantity (this would be pretty difficult to quantify), wetlands, floodplains, recreation areas/public lands, and wildlife and habitat areas. The assessment area could be FDOT District(s), the Water Management District, the respective County, the drainage basin, the Hydrologic Unit Code (HUC) Basins, and/or the FDEP Ecosystem Management Areas.

#### ACOE

Primary Goal: 1. Past state of the resource, 2. Present state of the resource, and 3. Projected state of the resource (reasonable foreseeable).

Trend Analysis: This may be accomplished with arials (current vs. historic arials) and the new information within the EST regarding the New YB\_DECADES\_D# layer(s) by DOT District-including Year Built of Land Use, Mobility, Relocation, Social, Historic and Archaeological.

The sustainability of the resource will be determined by the data/classification of the parts of the resource identified and the use of a functional analysis to determine potential effect.

Resource: (1) waters of the United States (including wetlands) which may be subdivided by FLUCFCS or other unit classifier (floodplain wetlands, palustrine emergent, estuarine, etc), and (2) The assessment area is the watersheds as defined by the U.S. Army Corps of Engineers.

#### SRWMD

Resource: wetlands, rivers, lakes, springs, canals, ditches, other surface waters, floodplains, sink holes, coastal and marine, tributaries, recreational/public lands, water quality and quantity, special designations

Assessment area: drainage basins/sub-basins, watersheds

#### ***2. Define the data sets that would be used to assess potential cumulative effects to the resource.***

- ***Data sets on the EST (review the list of data sets and provide a listing of those that are useful to cumulative effects evaluation).***
- ***Data sets not on the EST that are desired to be included on the EST (include the source of the data and contact information if available).***
- ***Other “off-line” data that will be used (e.g., resource recovery plans).***

#### EPA

No response by EPA at this time on data needs. Will provide comments and input on this issue at next meeting or later in ICE workgroup process.

#### USFWS

It appears that the land use data containing FLUCCS codes that provide potential habitat for the scrub-jay are available on the Environmental Screening Tool (EST). I currently don't have sufficient knowledge of the EST to determine if a GIS analysis of the potential scrub-jay habitat in the assessment areas described above can be accomplished. But I assume that it is possible. I also believe that data on approved development projects are currently available on the EST (*i.e.*, Corps permits, development orders under the State of Florida's Developments of Regional Impact program, Water Management District Environmental Resource Permits, County Comprehensive Plan Amendments, Zoning Amendments, and Planned Unit Developments). This information is necessary for the Service to provide a more accurate estimate of the amount of potential scrub-jay habitat available.

I am not aware of any other available data sets that should be included on the EST that would be useful for a cumulative effects analysis. However, if we acquire data in the future that is useful in

the analysis of cumulative effects we will make it available to the Florida Department of Transportation.

As part of our cumulative effects analysis, the Service may use other data where available including occurrence data for the Florida scrub-jay found in our database, data presented in the literature or data presented in survey reports from other projects.

### NMFS

Data sets currently on the EST which might be used for cumulative assessments include those delineating seagrass beds, seagrass bed scar damage, mangroves, wetlands, Florida coral reefs, patches and platforms, sea turtle activity, sea turtle nests, Florida artificial reefs, Gulf sturgeon and Johnson's seagrass critical habitat, land use (present and projected future), DRI's, ocean dredged material disposal sites, FDEP mitigation banks, Florida marine facilities, National estuarine research reserves, sanctuaries, parks and seashores, and environmentally sensitive shorelines. At the moment however, these data sets reflect only the most recent data, but do not allow a comparison with historical data to examine the trends in the resource over time.

Data sets not currently on the EST, which could be useful in analyses, include statewide census data or sightings data for the threatened/endangered species listed above (which should be available through FWC's Florida Wildlife Research Institute (FWRI) or NMFS's Protected Species Division). Census data from FWC's Fisheries Independent Monitoring Program might also be helpful (covers about 19 years for some Florida estuaries and less for others) and I believe it can be obtained from FWRI.

"Off-line" data which might be useful could include state and Federal reports on wetland losses/gains.

### FDEP

Data sets on the EST include: Drainage Basins 1997  
National Wetlands Inventory  
Wetlands – Derived from Land Use 2000  
Major Rivers of Florida  
Streams and Springs  
Sinkholes  
Mangroves  
Seagrasses  
FNAI Element Occurrence  
Outstanding Florida Waters  
Aquatic Preserves  
Surface Water Class Boundaries  
FEMA Flood Zones  
Specific Soils  
Drastic Coverage for the Floridan Aquifer, Intermediate Aquifer, and Surficial Aquifer  
Impaired Waters  
FDEP TMDLs for Listed Waters

FNAI Managed Areas  
Florida Forever Lands  
Public Lands  
Existing Trails 2005  
Strategic Habitat and Conservation Areas 2000  
FNAI Habitat Conservation Priorities  
Greenways Ecological Priority Linkages  
Brownfield Location Boundaries  
Hazardous Material Sites 1997  
Superfund Sites  
DRIs  
2000 Florida WMD Land Use and Land Cover  
Future Land Use North and South

Data sets not on the EST that are desired to be included on the EST include ERPpa, a Statewide coverage of Permit Application Tracking System (PA) for Environmental Resource Permits (ERPs). This data is available from the FDEP (<http://appprod.dep.state.fl.us/parep/default.asp>). Also, the Current Local Government Future Land Use Maps (FLUMs). FDOT is working on acquiring an integrated, updated data source?

If ERPpa data cannot be uploaded to the ETDM website, it may have to be an off-line data set. ERPpa is constantly updated as FDEP, Water Management District, and delegated local government ERP permits are issued. Given the frequent updates, I'm not sure whether it would be possible to include this data on ETDM.

#### ACOE

(1) NWI, Wetlands 2000, Wetlands 1995, FLUCFCS, Soils data, aerials, Census data, DRI, USACE permitting (FILL), FDEP & Water Management Permitting (FILL)

(2) National Land Cover Data (USGS), USGS Quads

#### SRWMD

The data sets currently a part of the Cumulative and Secondary effects are mostly useful.

Data sets that would be useful: SRWMD Drainage Basins, SRWMD District Lands, SRWMD Permit points/boundaries, ACOE and FDEP Permit points/boundaries, other agencies permit points/boundaries, FEMA Maps, River Miles, 10 year and 100 year flood contour lines (SRWMD)

Offline Data Sets: FDOT Work Plans, LRTP's, Comprehensive Development Plans, DRI's, Growth Plans,

Contact on SRWMD GIS layers: Bebe Newsome, 386-362-1001

***3. Define any standard analysis that can be conducted to support cumulative effects evaluations. (GIS query on the EST to aid in the analysis of a resource of potential effects to the resource)***

EPA

- My initial feeling is that a cumulative impact/effects analysis goes way beyond being able to utilize standard data sets which are currently in the EST. I think that it will be difficult to compile, assimilate, and input data into the EST which will then provide (“spit out”) useful information, data, maps, tables, etc. to be used in a cumulative effects analysis. However, some of the data in the EST can provide us with the “present” portion of a cumulative effects analysis (past, present, foreseeable future).
- One methodology or technique that could be used is the Smart Growth Index – a modeling tool used to evaluate the effect of different land use scenarios and the alternative transportation investments needed to address them. The model indicates how different land use development patterns can affect the type of transportation investments needed.
- Another technique that could be used is a community comparative analysis – compare traffic, growth, development (quantity & type) of a similar past project location with similar variables and that similar transportation improvements made 10 years ago to the current proposed project area. Look at land use changes and development that has occurred in the past location (corridor, community, etc.) and the effect on resources (both positive and negative), and then see if a comparative analysis can be made to the current project.
- Historical aerial photography, land use maps, land use plans, etc. should be used to support cumulative effects analysis.
- Transportation data to include regional traffic data/trends, current long range transportation plans, and transportation improvement programs for given metropolitan areas.

USFWS

The Service is not aware of any standard analysis that currently occur or could be added to the EST that can be used in support of a cumulative effects analysis for the resources that we are responsible for.

NMFS

The type of analysis I would like to see is one that would show changes in the acreage (e.g. mangrove habitat) or numbers (e.g. smalltooth sawfish sightings) of the resource in question over time for the assessment area. This could be represented as a series of maps, a map animation, or some sort of chart or graph.

FDEP

Yes to GIS query.

ACOE

Breakdown of data or identification, classification, and reduction to classes for change analysis (Palustrine hardwood wetlands within 1000 feet from a waterbody).

#### SRWMD

Could Comprehensive Development Plans, DRI's, Growth Plans, LRTP's be added into the system so they could be included in the GIS query or perhaps on an aerial or plan view for the basin being reviewed?

***4. When the analysis should be conducted (e.g., planning screen, programming screen, project development). [Example: during the planning screen and updated during the programming screen and project development to account for most recent available information]***

#### EPA

A cumulative impacts analysis should take into account impacts from multiple projects (federal, non-federal, local, private, etc.). The overall feeling is that the analysis should be conducted as early as possible in the planning process, to include as many projects as are currently known or anticipated. Therefore, the planning screen phase is probably the best place to conduct the analysis. Focus on areas or resources at risk (303(d) waters, important aquatic resources, wetlands, habitat, species, EJ communities, air non-attainment areas, concentration of sensitive receptors, etc.), then identify a threshold concentration of projects and/or development that over time would negatively impact a resource or result in a resource no longer being sustainable at "some appropriate level." There could then be a reevaluation at a later phase (programming, project development).

#### USFWS

An analysis for each resource of interest should be conducted beginning with the introduction of the project in the programming screen. The analysis should be updated during the programming screen and again during project development as necessary. This level of effort will probably be sufficient to reflect any changes in the resource that has occurred.

#### NMFS

The analysis should be conducted during the planning screen, because if there is a problem that will be a show-stopper, there is no sense throwing more money at the project at that point. The information and analysis should be updated at the programming and project development phases, if "significant" new information becomes available.

#### FDEP

Analyses of multiple projects every 2 to 3 years within a chosen defined area – FDOT District, WMD, County, Drainage Basin, HUC Basin, DEP Ecosystem Management Area....

#### ACOE

The analysis should be conducted during the planning screen of an individual project. This may be accomplished following an initial baseline Cumulative impact (CI) analysis and the periodic update of that baseline with information from MPO's. This baseline or updates may then be utilized by the ETAT members during the planning stage to assess the effect of the project against trends of the potential sustainability of the particular resource. If it is identified that the years projects would all impact a particular resource (Hardwood floodplain wetlands) then each project may be evaluated against the overall watershed percentage of Hardwood floodplain



wetlands to determine the potential effect upon the sustainability of that particular resource. This may lead to project modifications (reduction of project impacts - Avoidance & Minimization) and/or evaluation of potential mitigation needs for a watershed, and the evaluation of the necessity of the particular project as related to other viable projects within the same watershed.

#### SRWMD

Should be first discussed at the semi-annual FDOT District Interagency meetings. At the meeting we can discuss updates on development plans with DCA and MPO's to determine if and when the Cumulative effects should be reevaluated. Should be conducted during the planning screen and updated during the programming screen and project development if significant changes have occurred.

***5. What should be included in ETAT commentary about potential cumulative effects? (e.g., description of resources, rationale for assessment area, current state of resource, carrying capacity of resources, trend analysis, potential cumulative effects to resources, future state of resource if planned actions are implemented, other?)***

#### EPA

All of these should be included in cumulative effects commentary. See comment in #4 regarding resources at risk. The cumulative effects analysis should also include actions needed by DOT and other entities to protect resource(s) and to maintain sustainability of resource(s).

#### USFWS

You have pretty well covered it. The ETAT commentary should include: a detailed description of the resource, a description of the past and current status of the resource, a brief discussion of current threats to the resource, and as measures that could be implemented to conserve the resource.

#### NMFS

The commentary should include a description of the trend analysis results (where things stood at baseline conditions, the changes and rates of change over time between baseline and present conditions, what the projected rates of change are for the future), how much of a loss the resource in question will endure because of the proposed project, an estimate of how much more of a loss can the resource withstand before it becomes unsustainable or causes organisms which depend on it to become unsustainable.

#### FDEP

Yes to the above points. See DEP websites for additional ideas and information:

<http://www.dep.state.fl.us/water/wetlands/techgis/index.htm>

<http://www.dep.state.fl.us/water/wetlands/techgis/cumimp.htm>

<http://www.dep.state.fl.us/water/wetlands/techgis/download.htm>

#### ACOE

The ETAT should evaluate the particular impact, classification of the resource as described in C(1) above, to then compare to the baseline or updated CI analysis to provide comment on sustainability of resource. This is just the beginning.

#### SRWMD

Description of Resource, Assessment Area, Current State of Resource, Potential Cumulative Effects to Resource, Future State of Resource After Planned Actions, Recommended Actions

#### **Additional Comments:**

#### EPA

FHWA, in publications, has suggested that the consideration of both indirect (secondary) and cumulative effects should begin in the planning stages of the highway development process. It suggests analyzing these impacts at the planning stages allows for the identification of links that a project may have with other programmed development and area wide resource management or protection plans. Consideration of secondary and cumulative impacts during the planning stage facilitates the assessment of an area's ability to absorb additional development, the loss of businesses or residences, or if the watershed can absorb the loss of additional wetlands. [FHWA Position Paper: Secondary and Cumulative Impact Assessment in the Highway Project Development Process]

EPA agreed with suggestions made in this paper by stating that the best way to assess secondary and cumulative effects is during the planning phase where transportation networks are evaluated with respect to land use and resource management plans on a broad geographic scale.