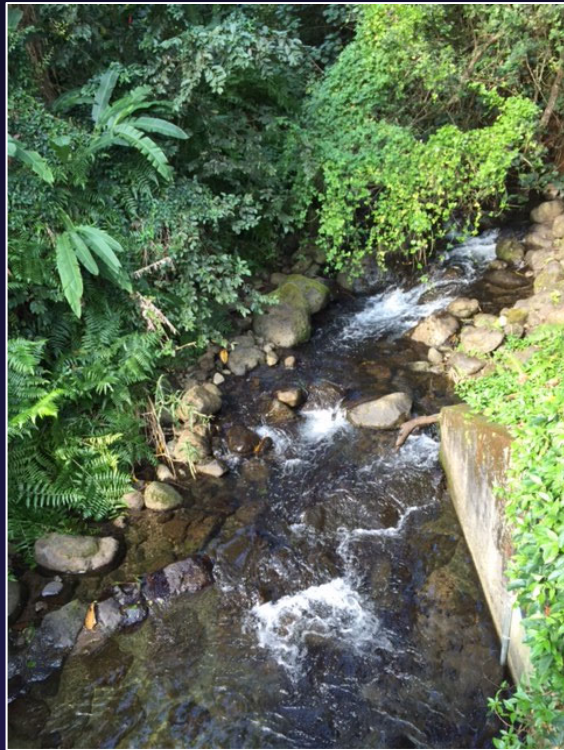


Service Areas



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June 2018



The Problem

- Concurrent mitigation: Knowing the impact site, where (and what) should the compensation be?
- Advanced mitigation: Knowing the compensation site, where can the impacts be?
- How do we answer this in advance, for a single compensation site (or all future compensation sites)?

What is a Service Area?

“...the geographic area within which impacts can be mitigated at a specific mitigation bank or an in-lieu fee program, as designated in its instrument.”

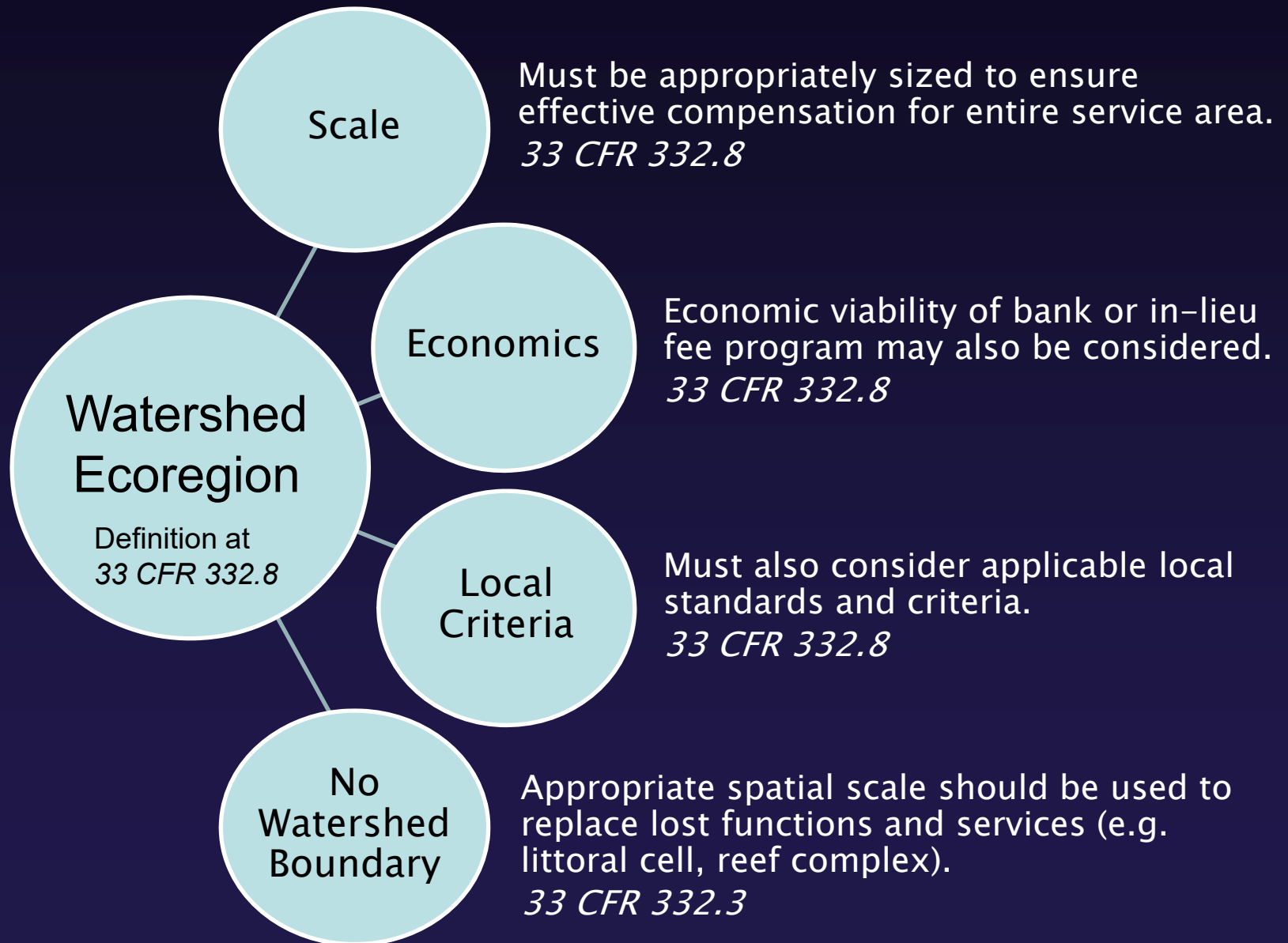
33 CFR 332.2

Mitigation Rule Considerations

- Watershed/Ecoregion
 - “The service area is the watershed, ecoregion, physiographic province, and/or other geographic area within which the mitigation bank or in-lieu fee program is authorized to provide compensatory mitigation required by DA permits.”

33 CFR 332.8(d)(6)(ii)(A)

Mitigation Rule Considerations



Mitigation Rule Considerations

- Watershed/Ecoregion
- Scale
 - ...must be appropriately sized to ensure that the aquatic resources provided will effectively compensate for adverse environmental impacts across the entire service area.”

33 CFR 332.8(d)(6)(ii)(A)

Mitigation Rule Considerations

- Watershed/Ecoregion
- Scale
- Economics
 - “The economic viability of the mitigation bank or in-lieu fee program may also be considered in determining the size of the service areas.”

33 CFR 332.8(d)(6)(ii)(A)

Mitigation Rule Considerations

- Watershed/Ecoregion
- Scale
- Economics
- Local Standards
 - “Delineation of service area must also consider any locally-developed standards and criteria that may be applicable.”

33 CFR 332.8(d)(6)(ii)(A)

Mitigation Rule Considerations

- Watershed/Ecoregion
- Scale
- Economics
- Local Standards
- No Watershed Boundary
 - “...where watershed boundaries do not exist, such as marine areas...appropriate spatial scale should be used to replace lost functions and services with the same ecological system (e.g., reef complex, littoral drift cell).”

Mitigation Rule Considerations

- Watershed/Ecoregion
- Scale
- Economics
- Local Standards
- No Watershed Boundary
- Coastal Watersheds
 - “Compensation....in coastal watersheds...
located in a coastal watershed where practicable”

33 CFR 332.3

CWA Approaches

- 1) Watersheds (or Hydrologic Units)
- 2) Ecoregions
- 3) Other Physical (e.g., landforms, ecological)
- 4) Administrative/Gov't Boundaries
- 5) Combination
- 6) Primary & Secondary

Documentation

“The basis for determining the service area must be documented in writing and referenced in the mitigation banking instrument.”

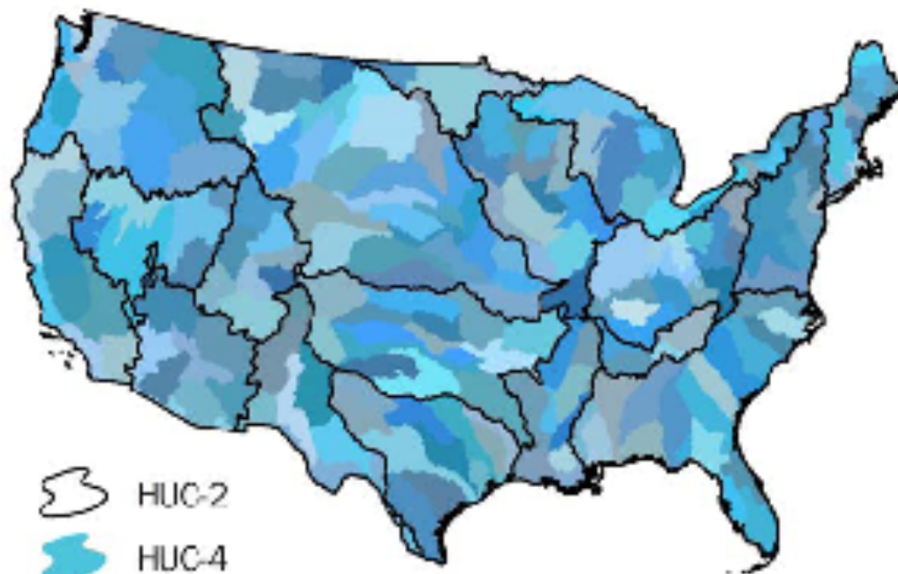
33 CFR 332.8(d)(6)(ii)(A)

Watersheds

- Watershed– A land area that drains to a common waterway.
- Water quantity and quality at a point on a stream reflects aggregate of characteristics of topography up gradient from that point.
- Suitable for spatially organizing ecosystem management or water quality management.

<https://www.epa.gov/eco-research/ecoregions>

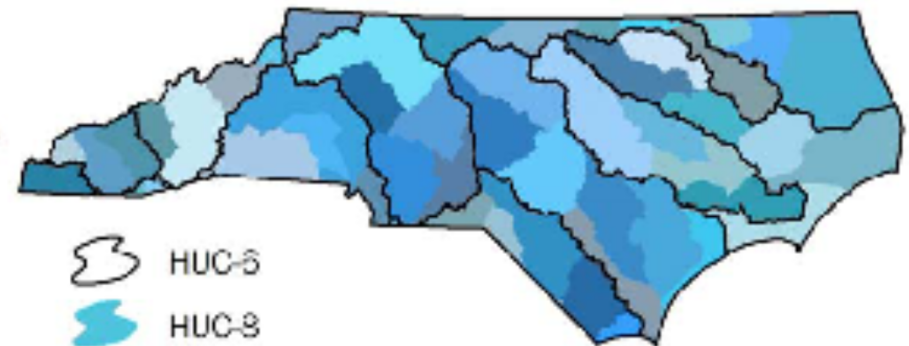
Hydrologic Units of the Continental United States²⁷



Level	Type	Area (sq. mi.)
HUC-2	Region	171,500
HUC-4	Subregion	15,295
HUC-6	Accounting Unit	9,341
HUC-8	Cataloging Unit	1,478

Average Area of HUC Classifications in the Continental US

Hydrologic Units of North Carolina^{27, 28}



Level	Area (sq. mi.)
HUC-11	120.2
HUC-14	32.9

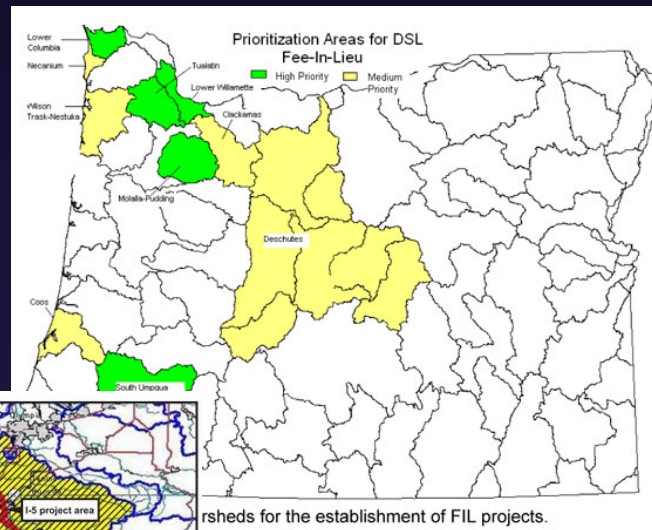
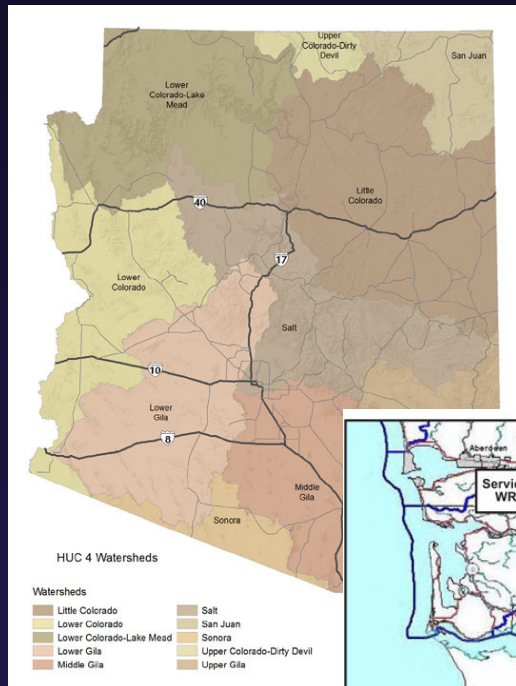
Average Area of HUC Subdivisions in North Carolina



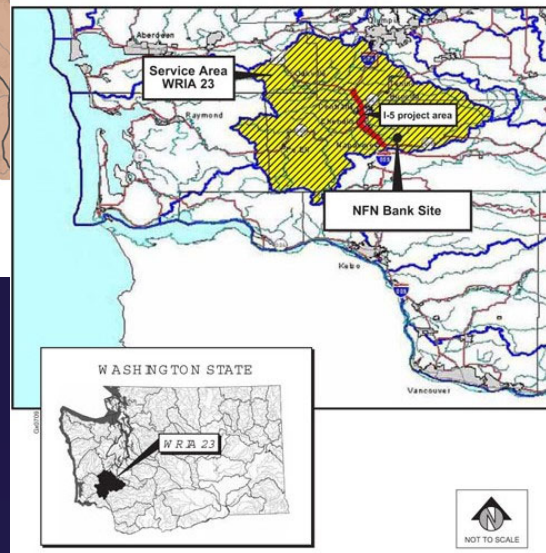
Source: Womble & Doyle, 2010

Approaches to Watershed Based Service Areas

AZGFD



OR
DSL



Watersheds for the establishment of FIL projects.

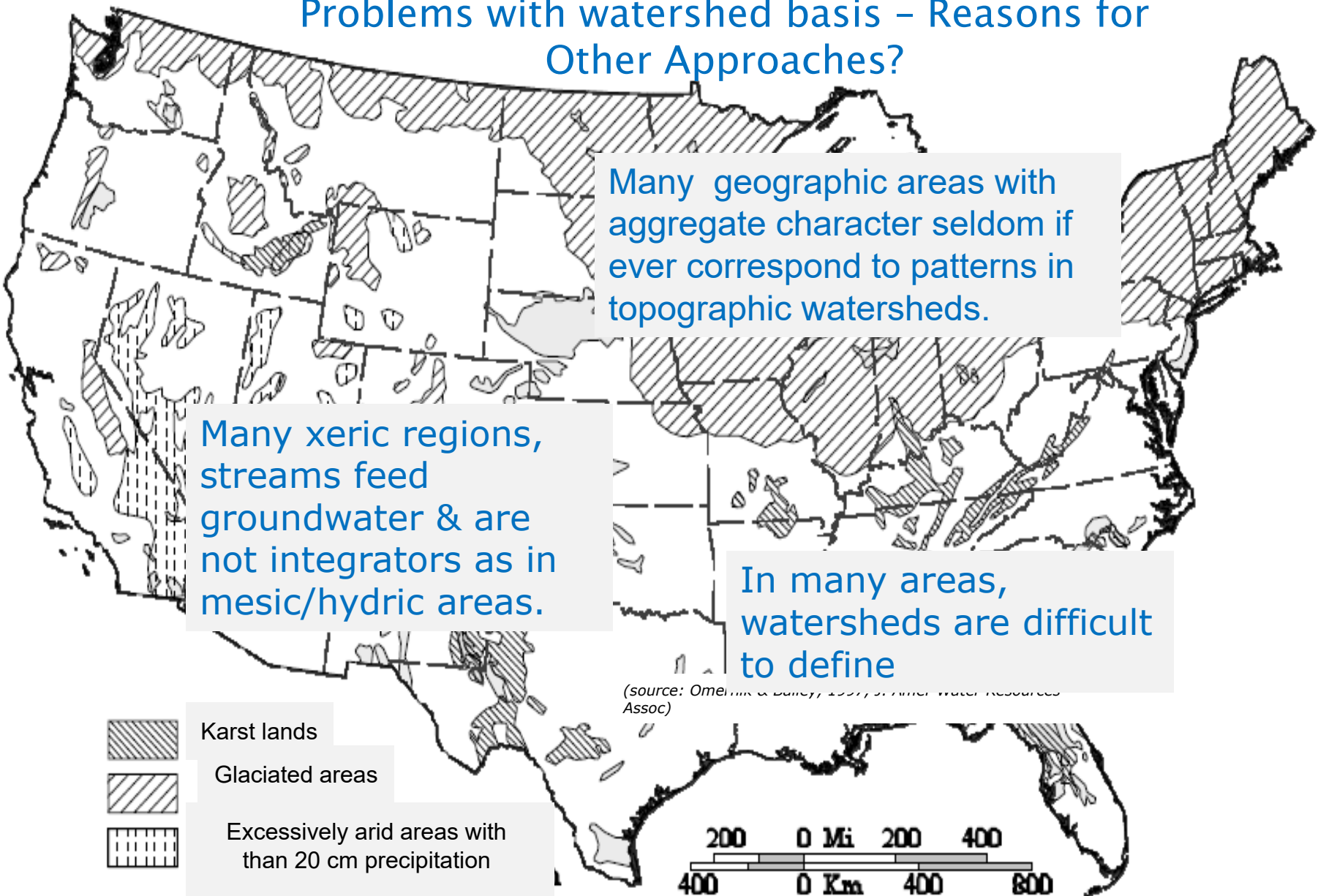
North Fork
Newaukum

Problems with watershed basis – Reasons for Other Approaches?

Many geographic areas with aggregate character seldom if ever correspond to patterns in topographic watersheds.

Many xeric regions, streams feed groundwater & are not integrators as in mesic/hydric areas.

In many areas, watersheds are difficult to define

- 
- Karst lands
 - Glaciated areas
 - Excessively arid areas with less than 20 cm precipitation
 - Sandy areas, more than 50 percent covered by sand

(source: Omerik & Bailey, 1997, *Water Resources Assoc*)

200 0 Mi 200 400
400 0 Km 400 800

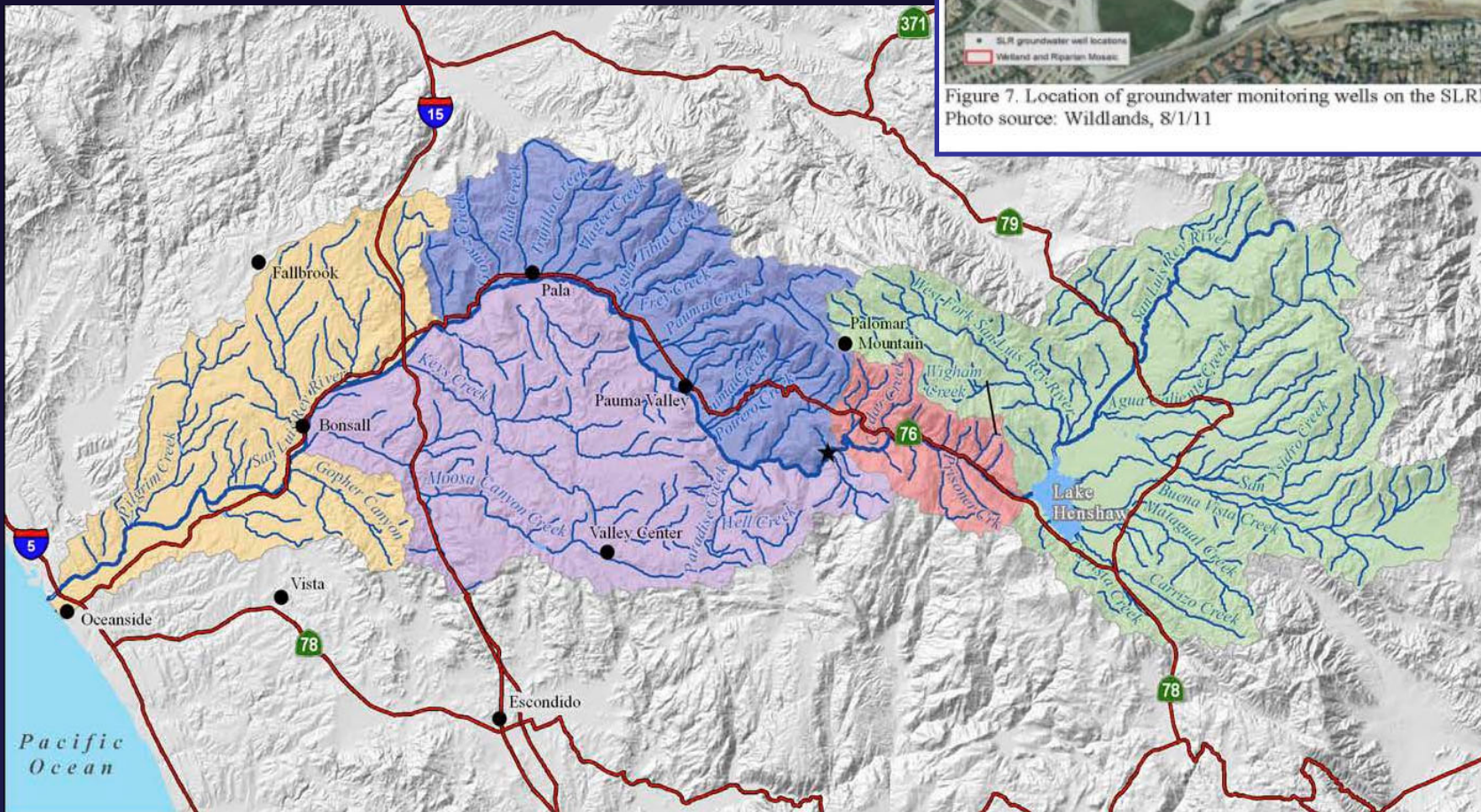
Considerations In Application

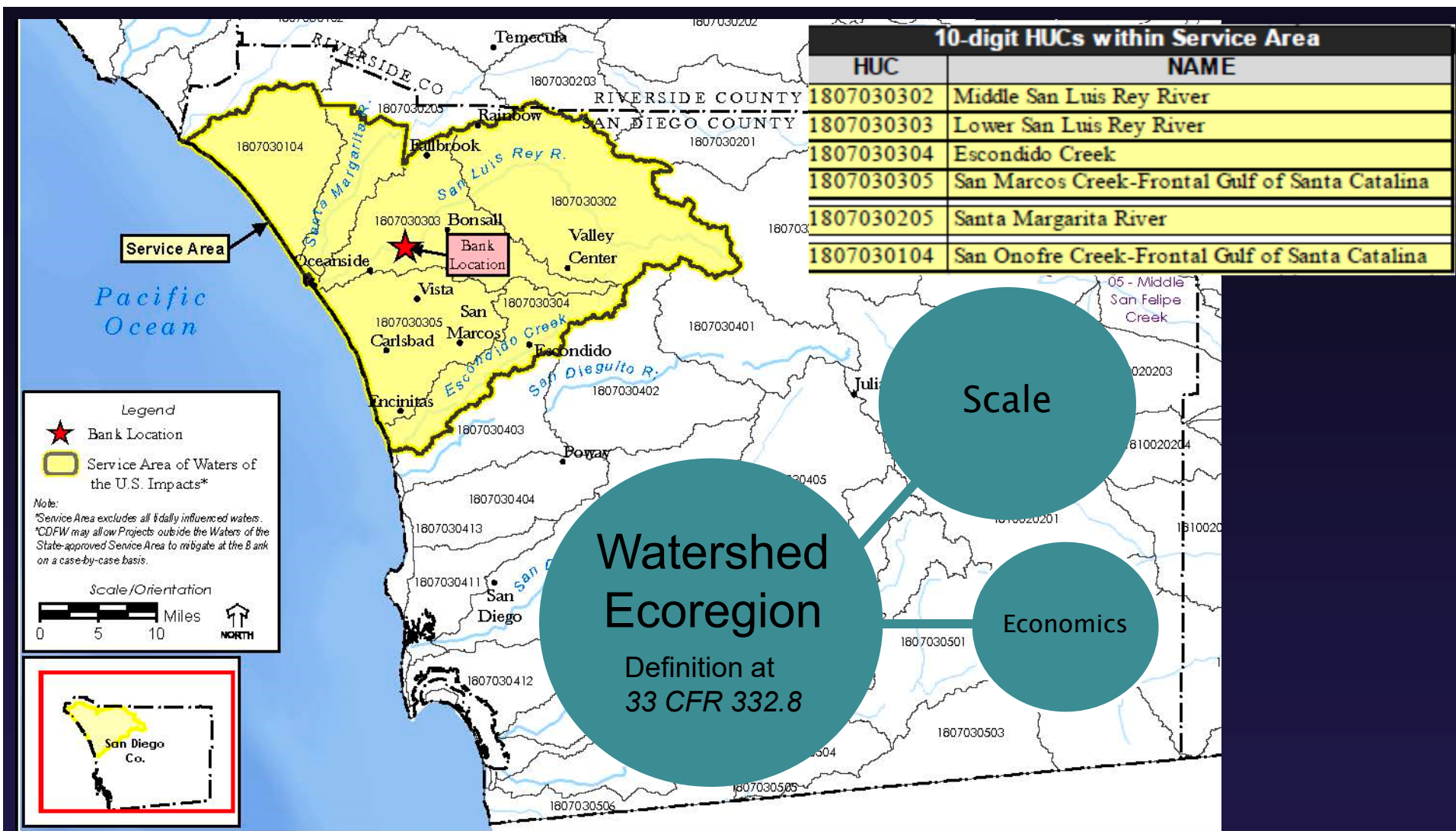
San Luis Rey Mitigation Bank

GROUNDWATER ANALYSIS



Figure 7. Location of groundwater monitoring wells on the SLRMB, and Figures 3-6. Photo source: Wildlands, 8/1/11

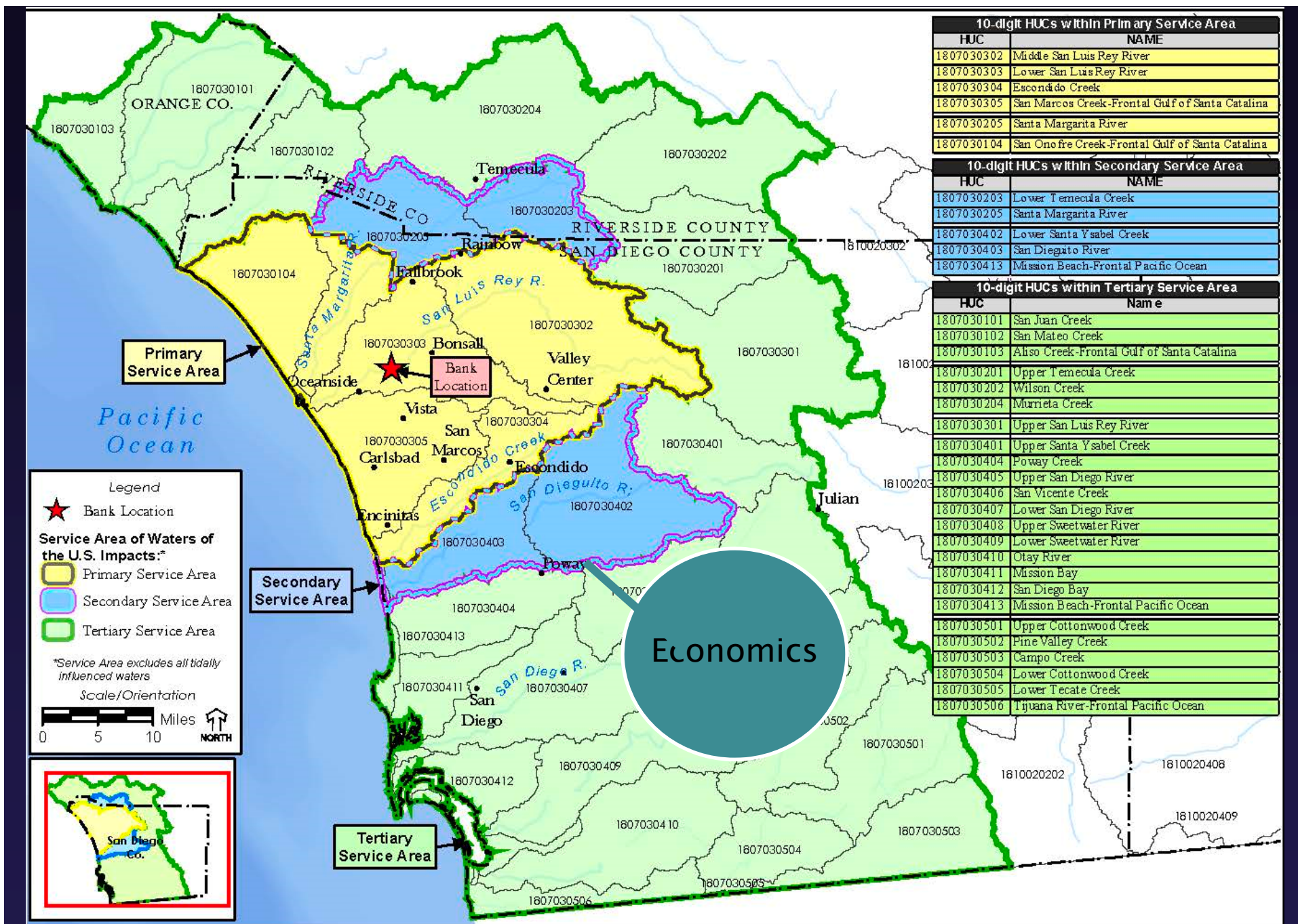




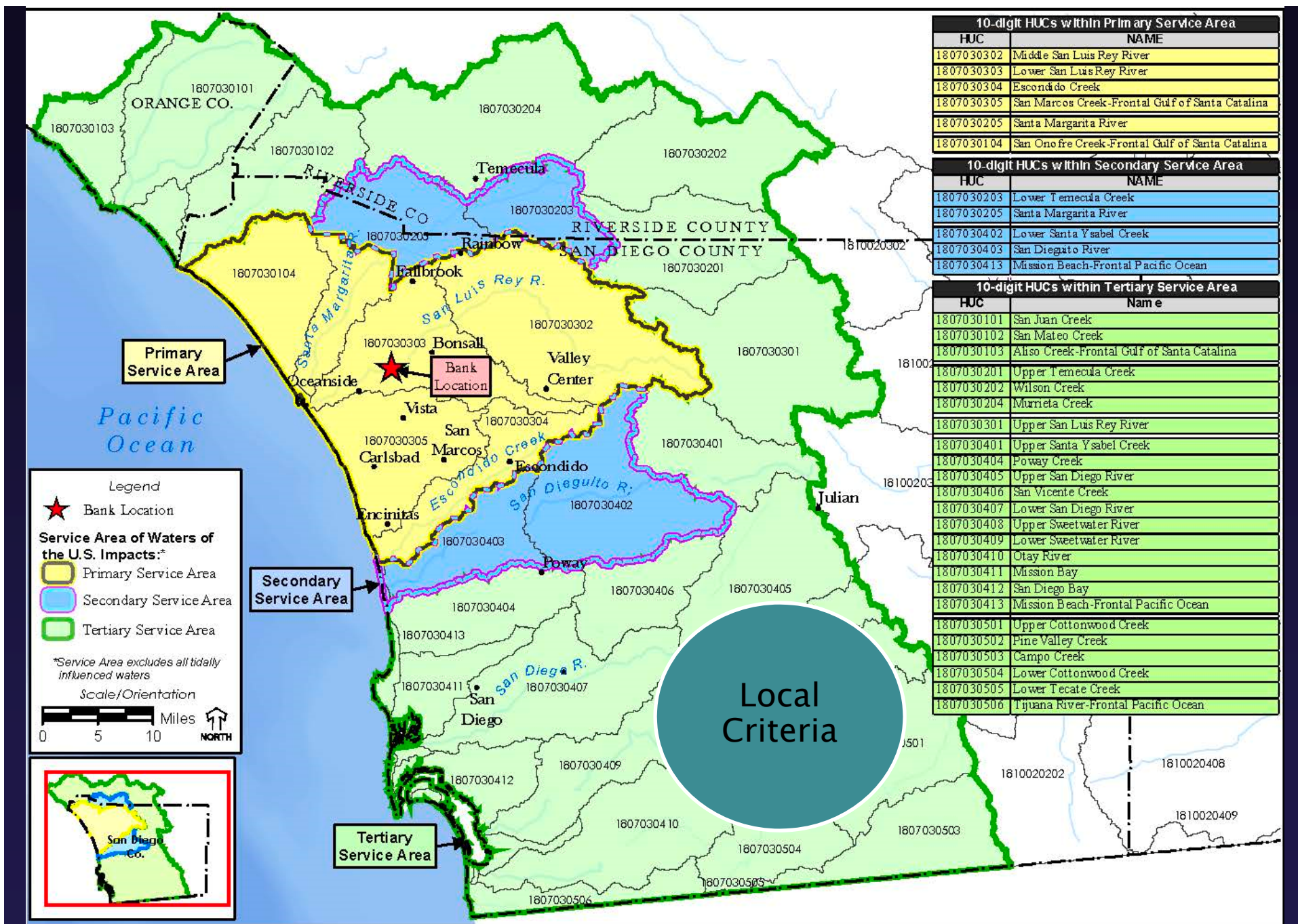
- Primary Service Area: Watershed Ecoregion, Scale and Economics

Watershed Characteristics

- soils
- special status
- vegetation
- critical habitat
- wildlife
- stream types



San Luis Rey Mitigation Bank – Secondary Service Area



Ecoregions

- Areas where ecosystems are generally similar.
- Similar landforms, soils, hydrologic resources, and plants and animals.

<https://www.epa.gov/eco-research/ecoregions>

National Health and Environmental Effects Research Laboratory
U.S. Environmental Protection Agency



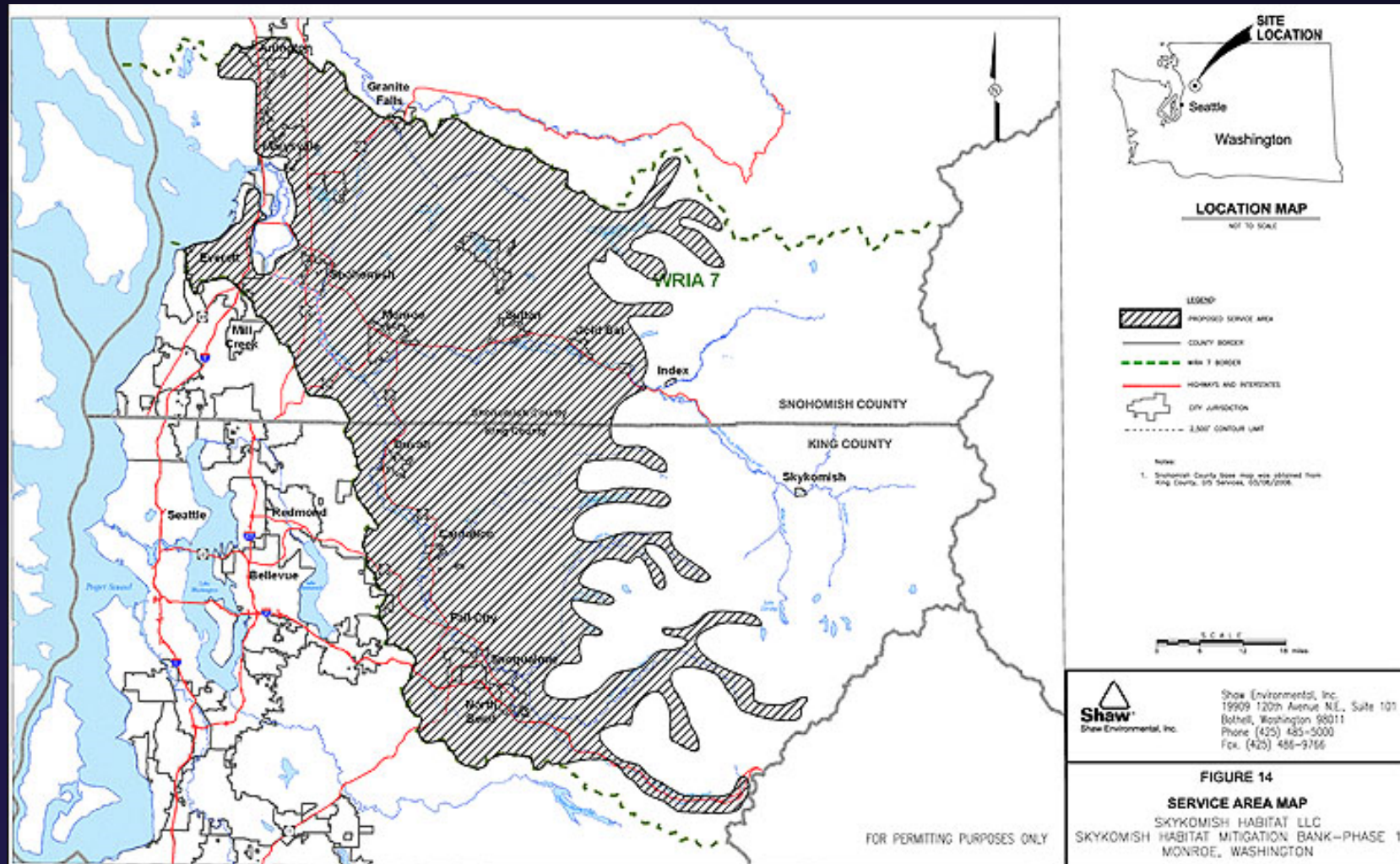
Use of Ecoregions

- In 12 districts, ecoregions *may* be used with HUCs as a factor in defining service areas:
 - Charleston
 - Fort Worth
 - Jacksonville
 - New England
 - Sacramento
 - Savannah
 - Detroit
 - Galveston
 - Los Angeles
 - Omaha
 - San Francisco
 - Wilmington
- In at least 3 of these cases, ecoregions are used to delineate a secondary &/or tertiary service area
 - Charleston – Fort Worth – Galveston

Ecoregion Boundaries

- Actual boundaries are areas where characteristics transition from one ecoregion to another
- Boundaries represented as lines
- Boundaries not as precise as mapped

Other Physical Regions– Landforms



Other Physical Regions– Landforms



Source: CWIS

Other Physical Regions– Marine Considerations

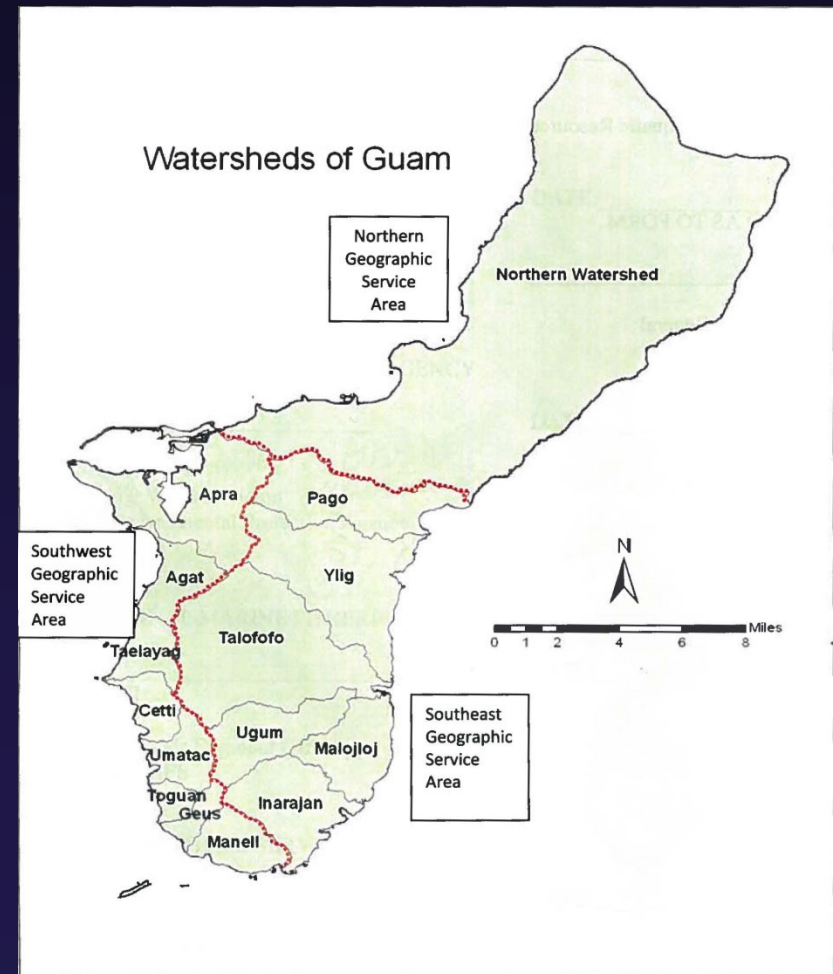
Littoral Cell– Geographic areas that consists of sediment sources, transport paths, and sinks.



Other Physical Regions– Marine Considerations

Littoral Cell– Geographic areas that consists of sediment sources, transport paths, and sinks.

Wave Climate– Proposed Guam ILF combined wave climates and watershed boundaries



Other Physical Regions – Marine Considerations

Littoral Cell– Geographic areas that consists of sediment sources, transport paths, and sinks.

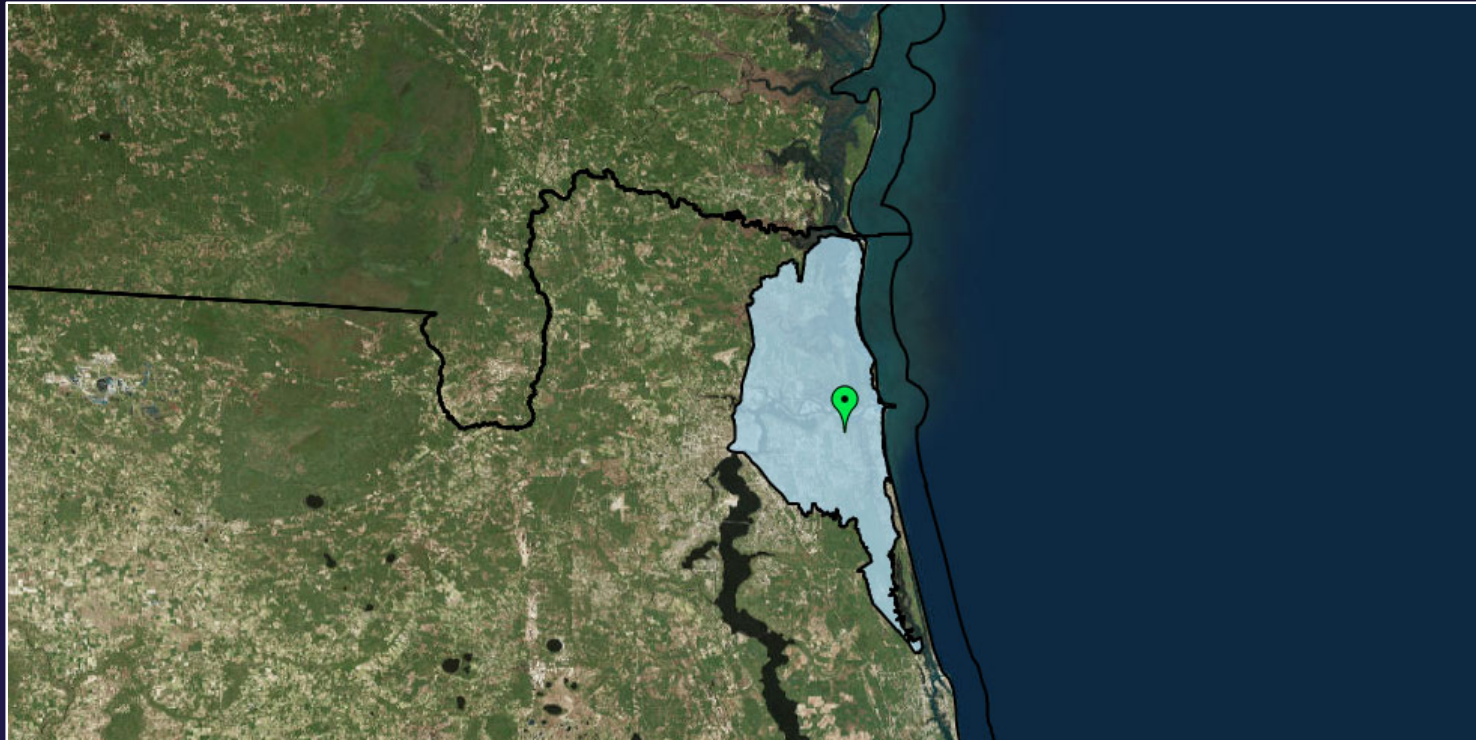
Wave Climate– Guam proposed ILF combined wave climates and watershed boundaries

Embayment– The entirety of a given bay

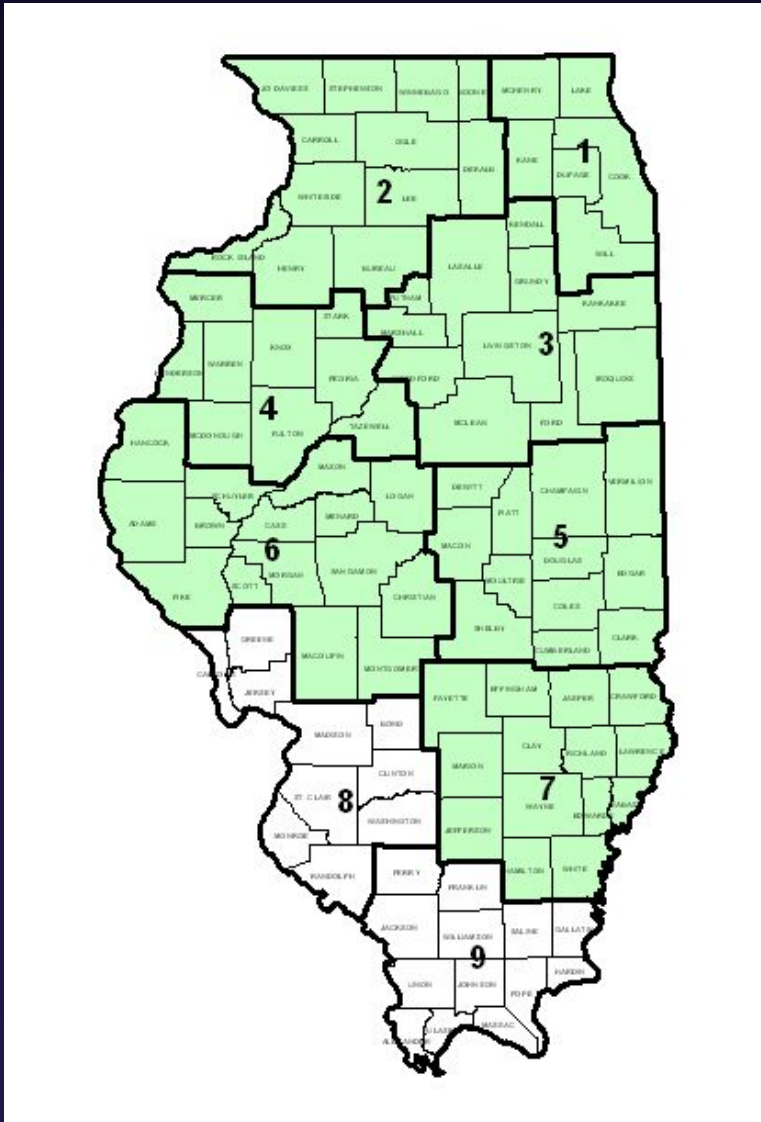
Navy Eelgrass MB
Service Area



Marine Example– North FL Saltwater Marsh MB



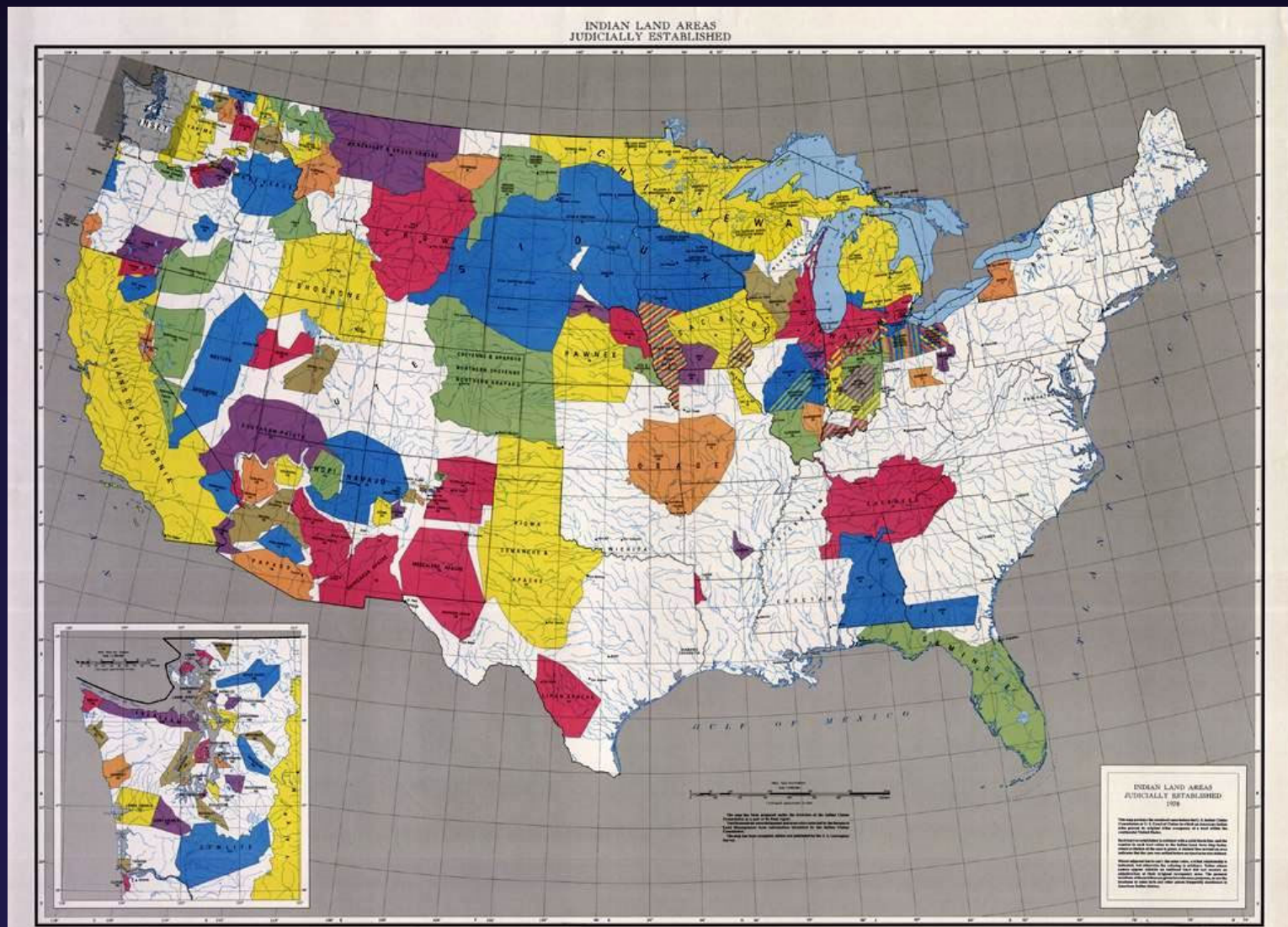
Administrative Boundaries



IDOT Banks

Under Illinois
Wetlands Protection
Act, service areas
are IDOT Regions.

Tribal Boundaries



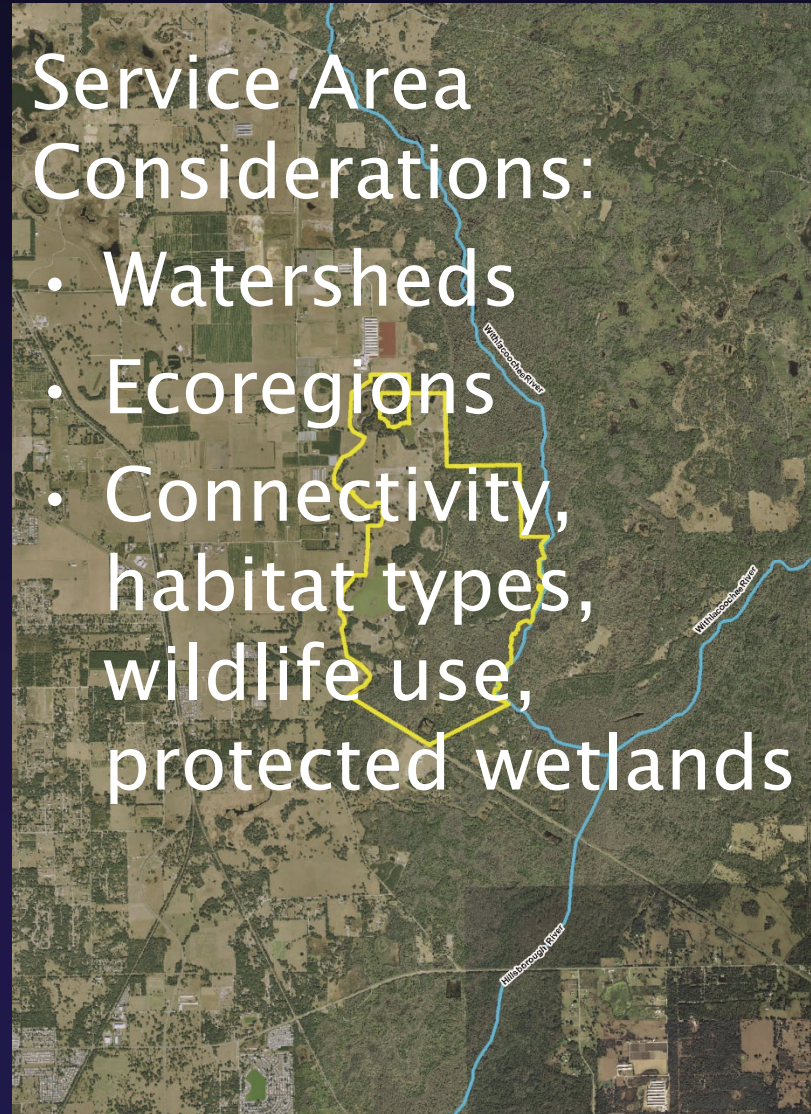
Combination: Boarshead Ranch

Bank Site:

- Located at headwaters of the Green Swamp
- Direct hydrologic contribution to Hillsborough and Withlacoochee Rivers

Service Area Considerations:

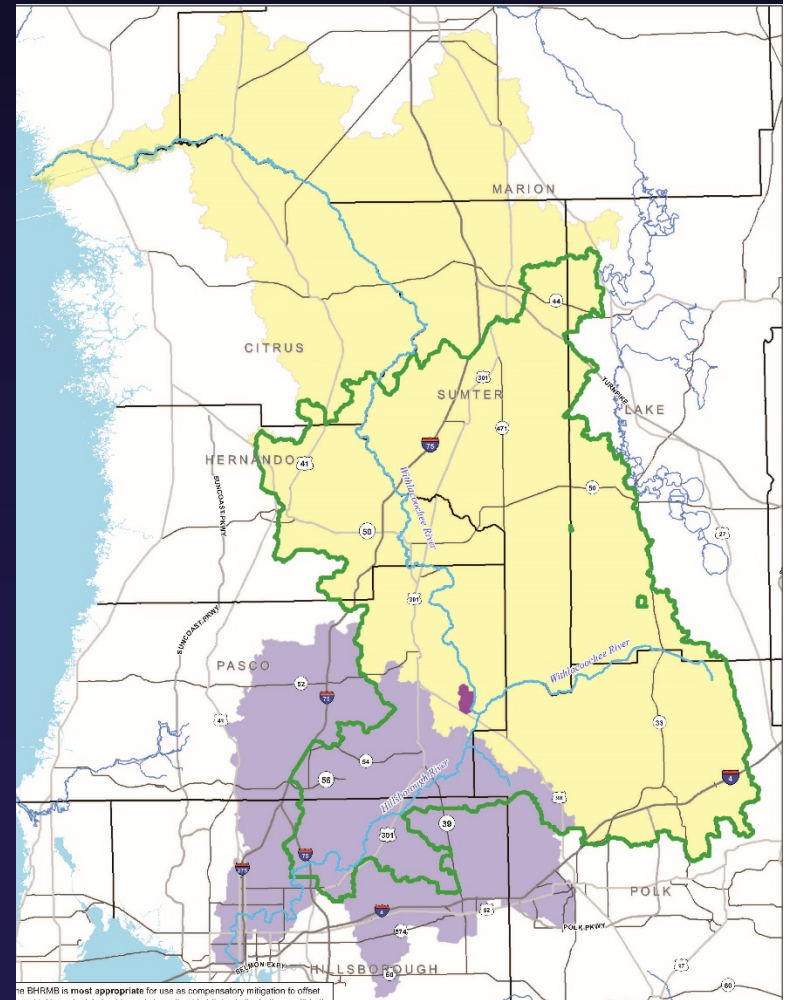
- Watersheds
- Ecoregions
- Connectivity, habitat types, wildlife use, protected wetlands



Combination: Boarshead Ranch

Service Area Justification:

- Upper portions of 2 HUC8 watersheds
 - Direct hydrologic connection, proximity
- Parts of 3 EPA Level IV ecoregions
- Habitat types at bank found throughout SA
- Home ranges of wildlife found at bank



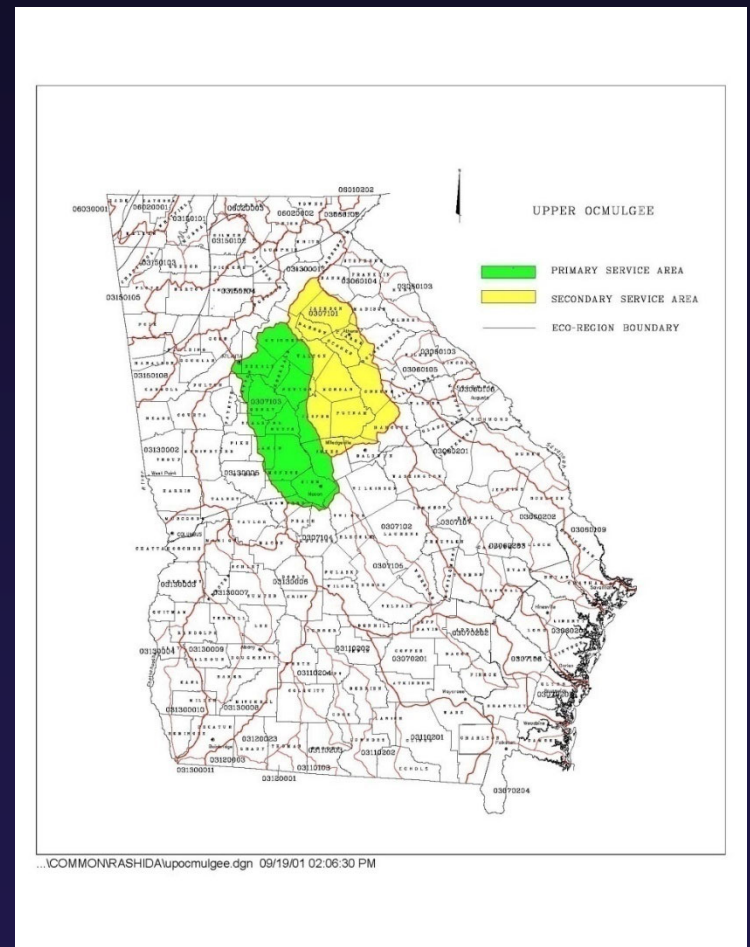
Secondary Service Areas

- Used to expand service areas used by banks
- Can be used in several ways:
 - 1) Limit project types that can use secondary SAs
 - 2) Increase ratios for use of secondary SAs
 - 3) Only allow if impact not in primary SA of another bank/ILF

Secondary Service Areas

Limit permit types that can use 2^o

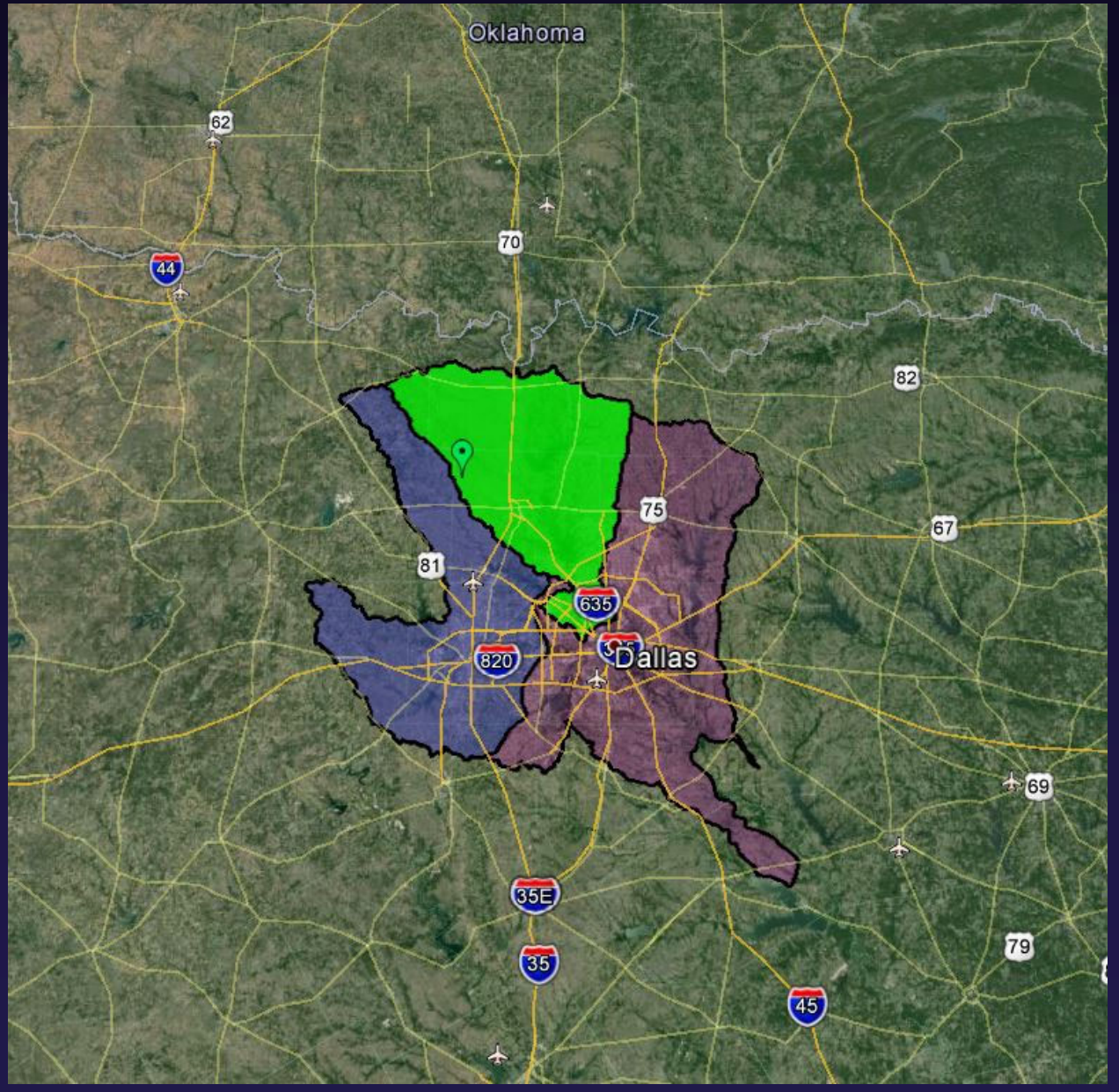
- General permits ONLY
- Prove that credits are not available from 1^o service area banks



Secondary & Tertiary Service Areas

Mill
Branch

*HUC-8s
&
Level III
Ecoregion*



Is there a most typical service area??

25 of 38 Corps Districts –
1 or more HUC-8s or
HUC-8s in combination with other features

(source: Womble & Doyle, 2010)

Districts with SA Guidance

Albuquerque

Baltimore

Charleston

Chicago

Detroit

Fort Worth

Galveston

Jacksonville

Kansas

Los Angeles

Mobile

Missouri Districts

New England

Omaha

Ohio Districts

Sacramento

San Francisco

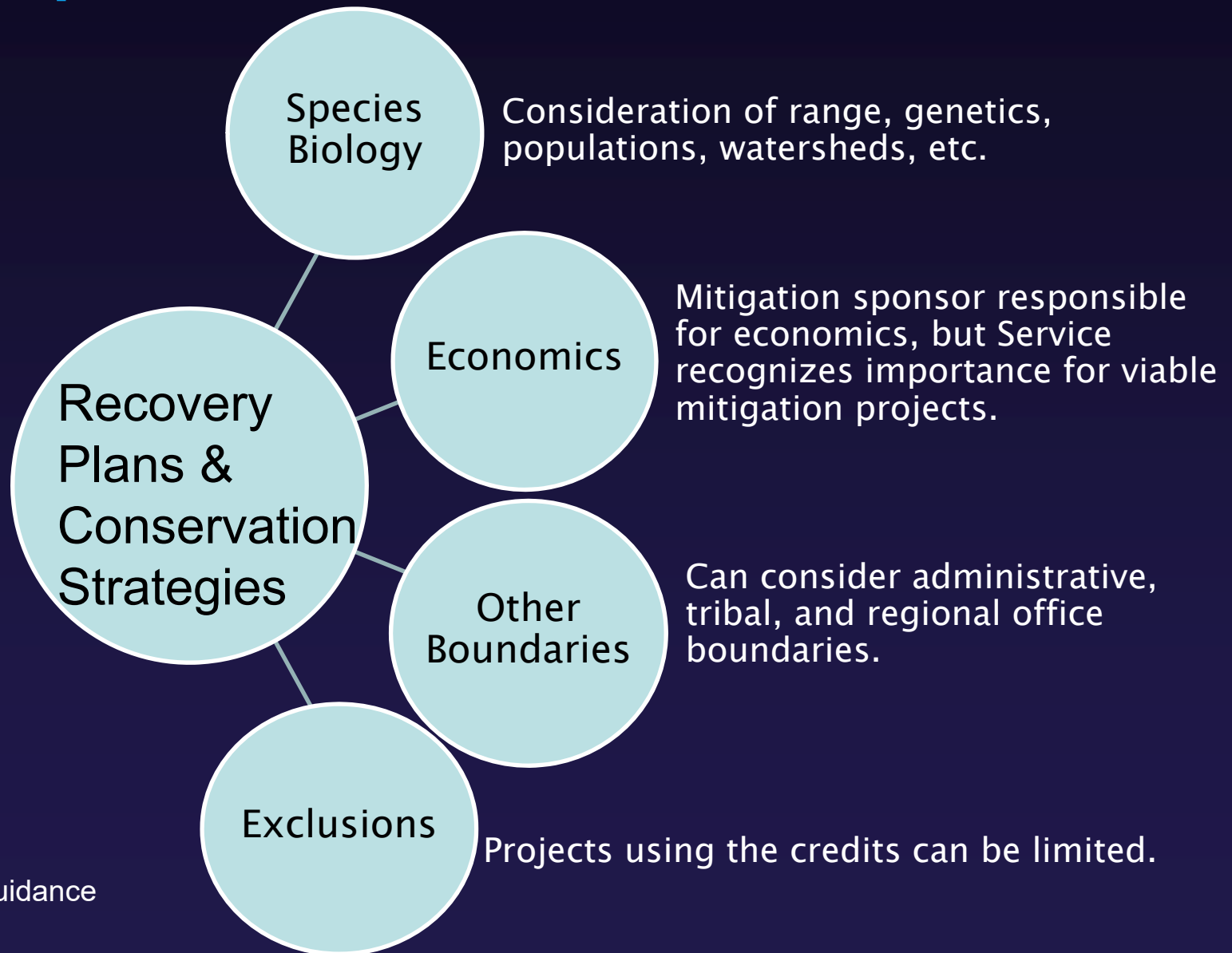
Savannah

St. Paul

Wilmington

Vicksburg

Species Considerations



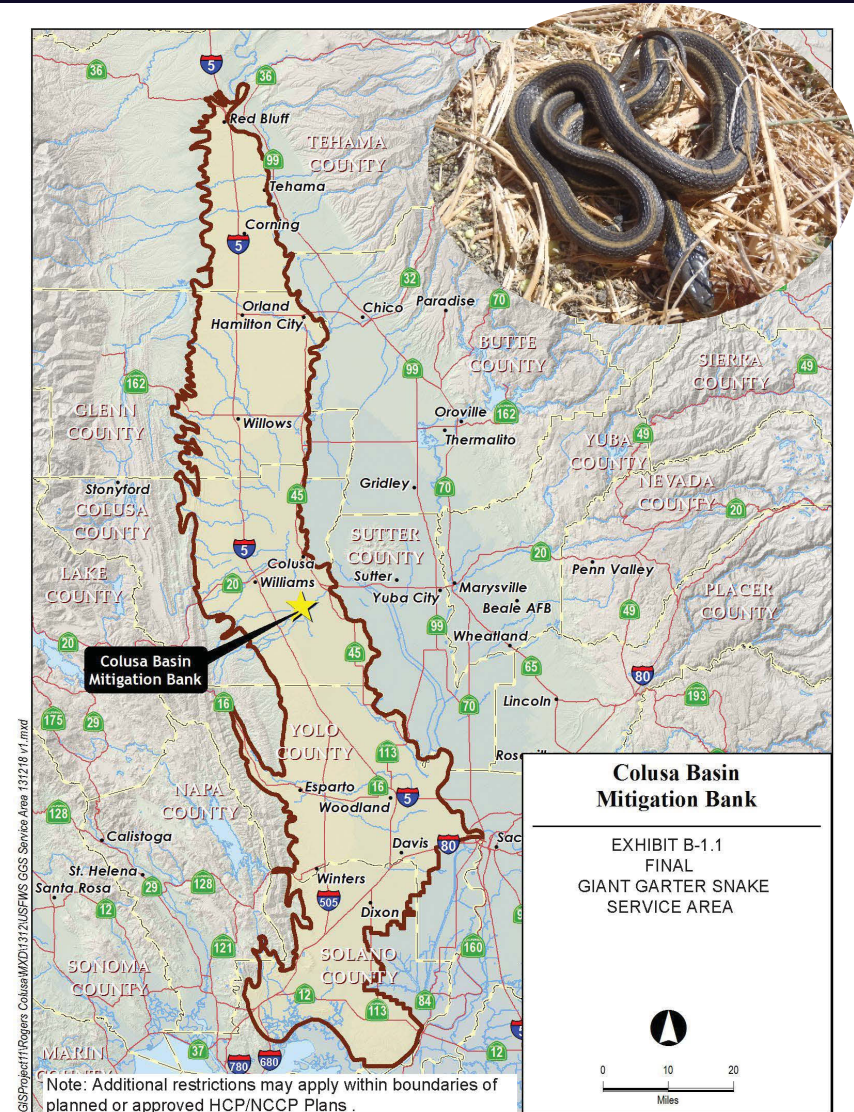
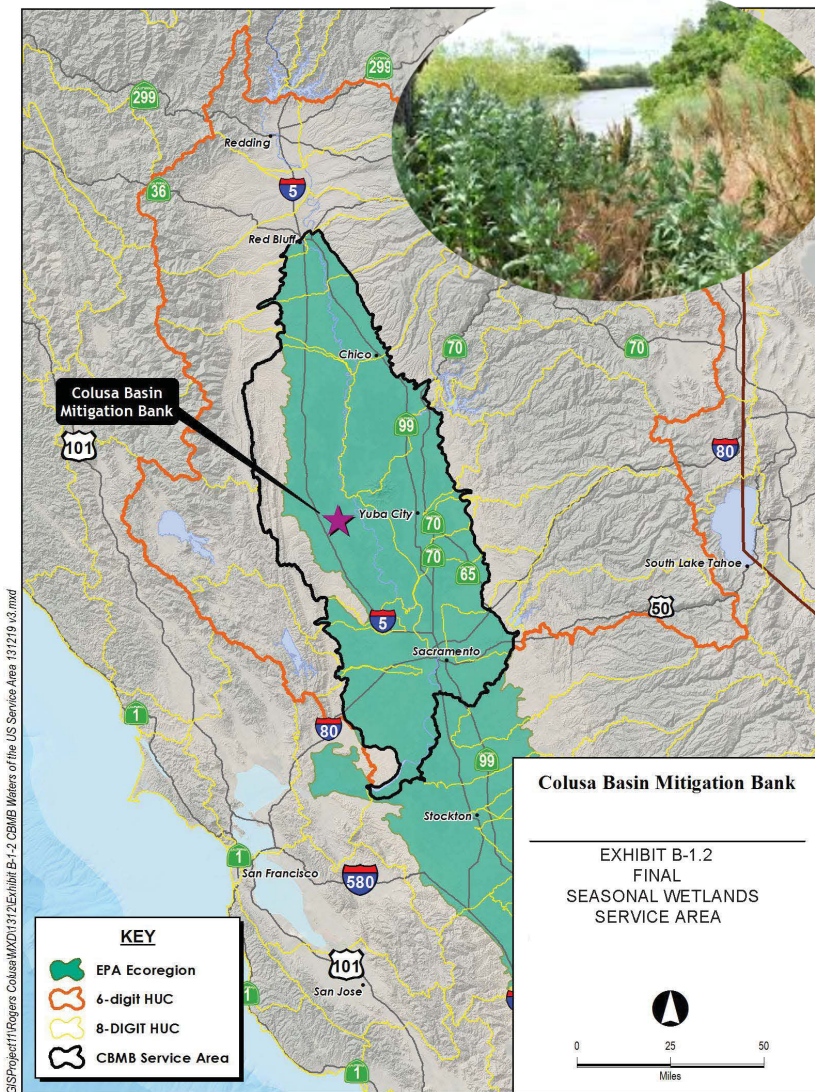
Species Approaches

- 1) Range, life history, genetics of species
- 2) Recovery Plan or Conservation Strategy
- 3) Habitat Conservation Plans
- 4) Administrative/Gov't boundaries
- 5) Primary & Secondary

Multiple Credit Types

- May not be able to identify single service that meets needs for all credit types at a site.
- Each credit type in a bank can have a different Service Area
- Service Areas for different credit types may overlap

Banks with Multiple Service Areas



Service Area Economics

(what a Banker is also considering)*

Service area is one of several considerations affecting mitigation bank economic viability

Among factors

- Need a sufficient market – with high concentration of impacts ...or...an extensive area
- A large bank acreage = much inventory to sell
- Post approval factors can limit the service area
- Service area needs to be sized to ensure adequate funding for O&M & long-term protection
- Banker needs to account for other compensation alternatives (competition) to either expand primary service area or create secondary service areas

** Source: Greg DeYoung, Westervelt Ecological Services, National Mitigation and Ecosystem Banking Conference, 2012*