

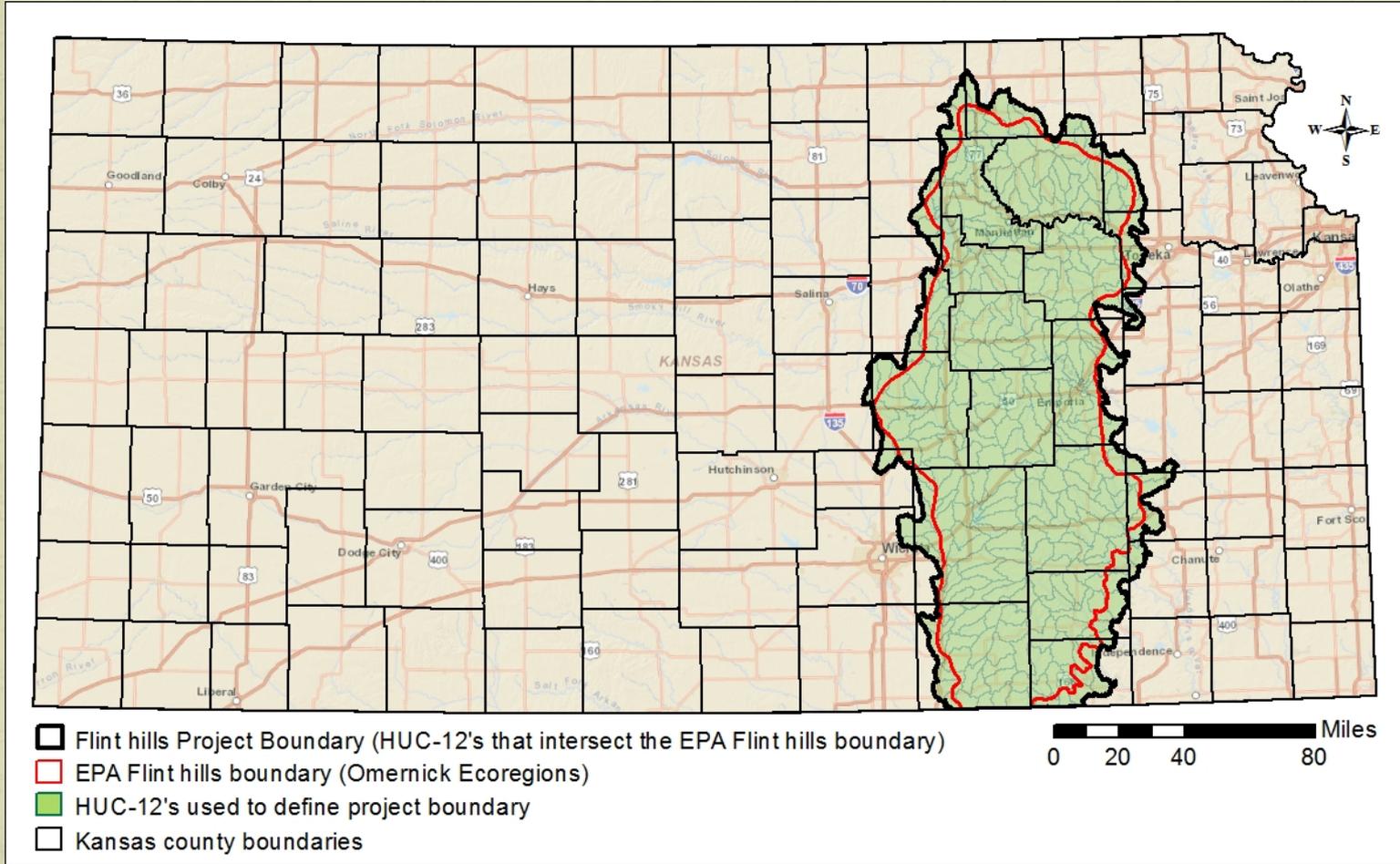


# Surrogate Species in the Flint Hills





# Version 1.0 Geography

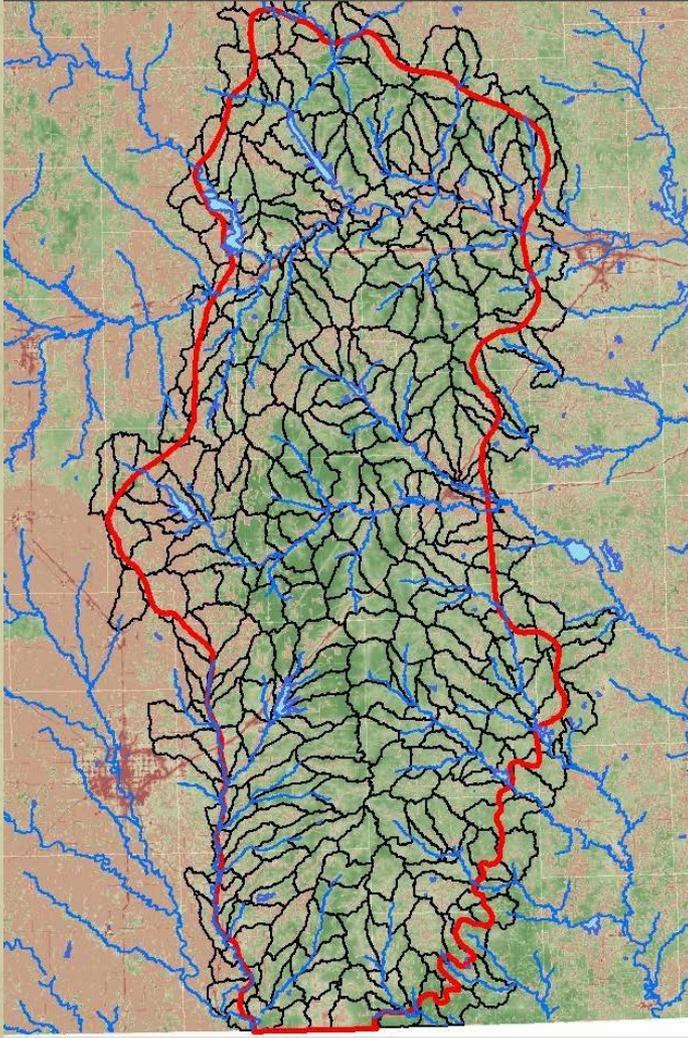




# Convergence Analysis

- Kansas State Wildlife Action Plan
- Listed or Candidate Species identified by the Service ECOS database
- The Surrogate Species evaluation from the Eastern Tallgrass and Big Rivers LCC
- The Flint Hills Legacy Conservation Area Land Protection Plan
- FWS Region 6 priority species for Strategic Habitat Conservation
- Native sportfish identified by KDWP.
- Other species of high state interest (game, furbearer, etc.)

# Aquatics Assessment



- Species of Conservation Interest
  - 27 fish species
  - 14 mussel species
  - 2 snail species
- Stratified by 4 major watersheds, order classes and habitat types
- Known distributions based on historic discontinuous sample locations
- Also considered variety of host species for mussels.

Potential Surrogate Species	Representing other Aquatic Species of Conservation Interest occurring in:
<b>Fish</b>	
Madtom Family (Neosho Madtom, Stonecat, Freckled Madtom, and Slender Madtom) – as indicators of habitat quality, availability, and diversity	Riffle habitats mainstem channels of the Cottonwood/Neosho, Fall/Verdigris, and Walnut Rivers and tributary streams of the Cottonwood/Neosho, Fall/Verdigris, Walnut, and Upper Kansas Rivers.
Carmine Shiner and Redhorse Family (Shorthead Redhorse, Golden Redhorse, and Logperch) – as indicators of habitat quality, availability, and diversity	Pool/Run/Glide habitats in mainstem channels of the Cottonwood/Neosho, Fall/Verdigris, and Walnut Rivers and tributary streams of the Cottonwood/Neosho, Fall/Verdigris, Walnut, and Upper Kansas Rivers.
Shovelnose Sturgeon – as indicators of habitat quality, availability, and diversity	Pool/Run habitats in mainstem channels of the Upper Kansas River.
<b>Mussels</b>	
Mapleleaf – as indicators of habitat quality, availability, and diversity	Mainstem channels of the Cottonwood/Neosho, Fall/Verdigris, and Walnut Rivers and tributary streams of the Cottonwood/Neosho, Fall/Verdigris, Walnut, and Upper Kansas Rivers.
Lampsilis species (Yellow Sandshell, Plain Pocketbook, Neosho Mucket, Fat Mucket) – as indicators of habitat quality, availability, and diversity as well as alternative host fish	Mainstem channels of the Cottonwood/Neosho, Fall/Verdigris, and Walnut Rivers and tributary streams of the Cottonwood/Neosho, Fall/Verdigris, Walnut, and Upper Kansas Rivers.
<b>Snails</b>	
Midland siltsnail – as indicators of water quality	Habitats in mainstem channels of the Cottonwood/Neosho, Fall/Verdigris, and Walnut Rivers and tributary streams of the Cottonwood/Neosho, Fall/Verdigris, Walnut, and Upper Kansas Rivers.



# Proposed Terrestrial Surrogates

**Surrogate Species:** Greater Prairie-Chicken

## Represented Species:

- Short-eared owl
  - American Golden Plover,
  - Henslow's sparrow
  - Eastern Meadowlark
  - Buff-breasted sandpiper
  - Black-tailed Jackrabbit
- Upland Sandpiper  
Dickcissel  
Common Poorwill  
Common Nighthawk  
Grasshopper sparrow



# Proposed Terrestrial Surrogates

**Surrogate Species:** Northern Bobwhite

## Represented Species:

- Loggerhead Shrike
  - Scissor-tailed Flycatcher
  - Harris Sparrow
  - Eastern Cottontail
- Brown Thrasher  
Field Sparrow  
Bewick's Wren



# Many Unknowns for the Surrogacy Hypothesis

- Multiple limiting factors and proximate causes.
- Effectiveness of existing conservation measures indeterminate and unknown quantifiable impacts on species.
- No population objectives -- some trend data available.
- Understanding population/habitat relationships of prospective surrogates and “represented” species is tenuous - existing data sets are spatially and temporally discontinuous. Not stepped down to F. Hills.
- Recommended robust geomorphic stratification approach (aquatics), multiple field investigations, development of predictive models, and critical assessment of resultant products – estimated cost and timeline.



# Next Steps

- Executive Oversight Committee and State Rep Review  
60 Day Review
- External Peer Review – March 2014  
100 day turnaround.
- After the Peer Review
  - State Comment Opportunity
  - FWS Internal Comment Opportunity