

Reproductive success and causes of nest failures for Mississippi Kites in the White River National Wildlife Refuge: response to altered hydrology?



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Research

- Research project started in 2004
- Continuation of studies on the Swallow-tailed and Mississippi kites began in 2001 (St. Pierre 2006)
- Objectives
 - reproductive success
 - causes of nest failure
 - habitat use



Hypotheses

Question

What are causing Mississippi Kite nest failures?

H₁ Mississippi Kite nest failures are primarily due to predators



Hypotheses

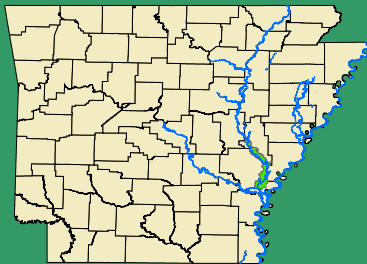
H₂ Mississippi Kite nest failures are due to weather



Study Area

White River National Wildlife Refuge

- 64,750 ha
- Arkansas, Desha, Monroe, and Phillips



Methods

Nest Searching

- Survey waterways for kites



Methods Nest Monitoring

- Binoculars
- Spotting scope
- Video cameras



Methods Video Recording Kite Nests

- Infrared
- Record 24 hrs/day
- Time-lapsed recorders

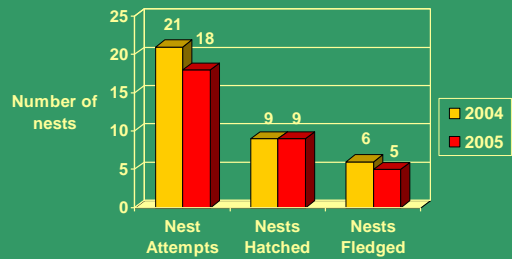


Results Nest Searching

- 2004
 - 21 Mississippi Kite nests
- 2005
 - 18 Mississippi Kite nests



Results Nest Success



Results Video Data

- 2004
 - 176 days of data (7 nests)
 - 2 predation attempts
 - 2 events which led to nest failures
- 2005
 - 225 days of data (9 nests)
 - 6 predation attempts
 - 5 events which led to nest failures



Results Video Data

- Attempts
 - Eastern gray squirrel
 - *Buteo* spp.
 - 5 raptors
 - western rat snake
- Depredations
 - Barred Owl
 - 3 western rat snakes
- Other events
 - chick fell out of nest
 - egg failure
 - nest abandoned

Discussion Hypotheses

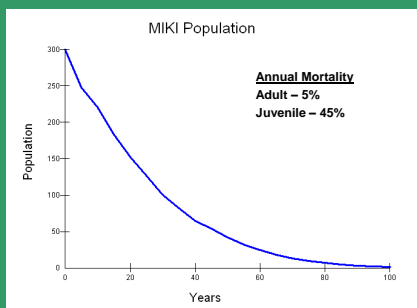
- H_1 is accepted
- No evidence to support H_2



Discussion Reproductive Success

Study site	Number of nest	Percent of nest hatching eggs	Percent of nest fledging young / hatched eggs	Nest success
Arizona	25	60%	94%	52%
Great Plains	391	59%	79%	49%
Illinois	28	86%	71%	61%
Missouri	24	--	--	42%
Arkansas	39	46%	61%	28%

Discussion Vortex Model



Discussion What has changed?

- Hydrology
- Large predators
- Clearing of forest
- Timber management practices

Discussion Hydrology

- Man-made dams
- Levees constructed in 1920's and 1930's
 - restrict flood water
 - inundates "high" islands



Discussion Hydrology

- Decrease of habitat for terrestrial predators and prey
- Predators forced to use arboreal habitats more frequently for shelter and to find prey
- Loss of habitat during floods may negatively affect terrestrial prey

Discussion Hydrology

- Limited terrestrial prey may force rat snakes into the trees, which may put more pressure on avian eggs and nestlings
- ASU researchers also documented the lowest reproductive success for Swainson's Warblers in WRNWR relative to all other locations studied
- Rat snakes were also the primary predator of SWWA nests

Discussion Timber Management

- Current management practices increase tree density allowing trees in the mid-story and canopy to be more connected
- May additionally give rat snakes greater advantage in an arboreal habitat



Acknowledgements

- Waylon Edwards
- Karen Rowe
- Richard Hines
- Jeremy Brown
- TJ Benson
- All other volunteers
- Arkansas Game and Fish Commission
- U.S. Fish and Wildlife Service
- Arkansas State University