

Applied Research Program Background

The Edwards Aquifer Habitat Conservation Plan (EAHCP) calls for the Applied Research Program to build knowledge about the Covered Species and to facilitate the collection of data for the Ecological Model. This effort provides the EAHCP with a more accurate understanding of the ecological dynamics of the Comal and San Marcos springs, particularly under low-flow conditions. Considering the Phase I schedule, it is likely that only five years will be available for Phase I experimentation. As such, key questions will need to be addressed during this time period, which will require a strict schedule and intense focus. Applied research was divided into three tiers: Tier A focuses on habitat, Tier B focuses on low-flow impacts; and Tier C on ecological model validation.

Applied Research in the HCP

6.3.4.2 Research in the Experimental Channels

✓ = Completed | IP = In-progress

Tier A. Habitat requirements and responses

- [✓] Low-flow effects on native aquatic vegetation
- [✓] Low-flow effects on macroinvertebrates (fountain darter food source)
- [✓] Flow levels effect on CSRB movement
- [IP] Test spring run connectivity (CSRB)
- [IP] Extended low-flow period effects on CSRB

Tier B. Low-flow impacts to Covered Species

- [✓] Low-flow effects on fountain darter movement, survival, and reproduction
- [✓] Low-flow effects on CSRB survival and reproduction

Tier C. Testing repeat low-flow occurrences or combination of effects

- System memory – more data needed
- Ecological model validation – 2016 or 2017

6.3.4.3 Additional Studies

Aquatic vegetation restoration and non-native plant removal *(accomplished by SAV system mapping; next in 2018)*

- Evaluate transplant methodologies for various types of native aquatic vegetation
- Evaluate success of transplants over extended time period
- Evaluate methodologies for removal of non-native plants

- Track maintenance required to keep non-native species from re-establishing Old Channel ERPA

Old Channel ERPA

- Evaluate the need for channel manipulation for the enhancement of fountain darter habitat in the Old Channel *(flow-split done, habitat restoration done, no other ERPA items)*

Other

- [IP] Non-native interactions with FD, including gill parasite/snails

Applied Research Studies Conducted to Date or In-Progress

2013

- pH Drift: Bicarbonate use of 6 potential aquatic plants
- Low-flow effects on FD food macroinvertebrates
- Low-flow effects on native aquatic vegetation
- Field vs. lab study

2014

- CSRB baseline population
- CSRB plastron
- Effects of predation on FD
- Low-flow effects on CSRB
- Low-flow effects on FD fecundity
- Vegetation decay and water quality

2015

- Algae dynamics
- CSRB habitat connectivity
- *Ludwigia* interference
- Sediment impacts on TWR

2016 *(in procurement)*

- Life history of the CSRB
- CSRB trophic level status and functional feeding group categorization
- CSRB long-term elevated temperature and low dissolved oxygen tolerances