

# EAHCP APPLIED RESEARCH PROJECT SCHEDULE



YEAR	Applied Research Program			Other Research Programs & Contracts			
	Research Categories	Research Projects	Biological Goal Reference & Rationale	Salvage Refugia	Refugia	EAA Modeling Plan	Eco Modeling
2013	1. EcoModel SAV	1. pH Drift				1. Develop FE Model	1. Develop EcoModel
		2. Low flow effects on native vegetation (NAS 49)				2. Develop ModFlow Model	
		3. Field vs. lab Study					
2013	2. EcoModel FD	1. Low flow effects on food source (NAS 44, 45)					
2014	1. EcoModel FD	1. Low flow effects on FD fecundity (NAS 44)				1. Develop FE Model	1. Develop EcoModel
		2. Effects of predation on FD (NAS 44, 45)				2. Develop ModFlow Model	
		3. FD movement under low flow (NAS 41)					
	3. Basic Biology of Species (CSRB)	1. Baseline distribution (NAS 51)					
		2. Plastron functionality					
		3. Low flow effects on survival (NAS 54)					
2015	1. Basic Biology of Species (CSRB)	1. Habitat connectivity		1. Training at SMARC		1. Complete FE Model	1. Develop EcoModel
		2. Algae dynamics		2. Produce F <sup>1</sup> TX Blind Salamander		2. Complete ModFlow Model	
		2. <i>Ludwigia</i> interference (NAS 44)		3. Work w/ TXSTATE and SMARC researchers			
		3. Sediment (recreation/turbidity) impacts on TWR (NAS 49, 50)		4. Obtain property access for collection research			
2016	1. Basic Biology of Species (CSRB)	1. CSRB tolerances of elevated temperature & low DO* (NAS 54)	Water quality, habitat quality	1. Collection methods/location for TX Blind Salamander		1. FE Model verification	1. Complete EcoModel
		2. Evaluate CSRB life history* (NAS 51, 52, 53, 54)	Population	2. Collection methods for CSDB		2. ModFlow Model verification	2. FD Random Drop Netting (NAS 42, 44)
		3. CSRB Trophic level & functional feeding group categorization* (NAS 51, 55)	Population	3. Establish suitable surrogates		3. Hardy Thermal Model verification**	3. FD Mortality in Adverse Conditions (NAS 41)
	2. Data	1. Compile data, format, template, normalization; IC consideration in Dec 2015 (#1 Priority)				4. Recharge modeling	
2017	1. Habitat Quality	1. SAV as FD habitat (shelter, prey habitat) (NAS 45, 46)	Habitat based population		Refugia research will accomplish the below deliverables for each species; moving onto the next step, only when the previous has been concluded for all listed species.	1. EcoModel verification***	
		2. Effects of sedimentation on SAV, FD and CSRB (NAS 56)	Habitat, water quality (silt free)			2. Recharge modeling	
	2. Quantitative Sampling Methods	1. CSRB quantitative sampling methods (NAS 55) (#2 Priority)	Population				
	3. Data & System Memory/Disturbance Ecology	1. Statistical analysis of data					
2018	1. Conservation Measures	1. Evaluate success of M&M projects (NAS Overarching Issues)	Each M&M project has EAHCP goals		1. Collection methods and locations	1. HydroModel Runs	
		2. Evaluate success of SAV restoration (coincides with 5 yr full SAV mapping) (NAS 44, 47, 48)			2. General husbandry (feeding, density, etc.)	2. EcoModel Runs	
		3. Confirm species-specific Tables 4-1, 4-21	TBD		3. Propagation techniques (egg to adult)	3. Recharge modeling	
	2. TBD	TBD	TBD		4. Reintroduction/genetics		
					Evaluate Life Histories of Covered Species		
2019	1. Conservation Measures	1. Evaluate success of M&M projects (NAS Overarching Issues: continuation of 2018 project)	Each M&M project has EAHCP goals			1. HydroModel Runs	
		2. TBD	TBD			2. EcoModel Runs	

**Legend/Footnotes**

- \* RFP developed and posted for solicitation
- \*\* Use low flow data from 2013 and 2014 for verification of model (desktop exercise)
- \*\* May require contract w/ Meadows
- \*\*\* Use data collected in 2016 to perform a verification analysis

NAS-recommended projects  
 Funding to be allocated/Research yet TBD

**NAS Projects Not Recommended for Implementation**

- 1. Determine the effects from phosphorus sources, cycling, and availability on the productivity of the ecosystems (NAS 58)
- 2. CSRB population (quantitative) and distribution in Comal (NAS 55)
- 3. CSRB population (quantitative) and distribution in San Marcos (NAS 55)
- 4. Evaluate CSRB status as an indicator species (NAS 57)

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