A Habitat Assessment Protocol to Determine Suitability for Southwestern Willow Flycatcher Occupancy in the Northern Rio Grande Watershed

Phase 1

Identify Parameters Critical to SWFL Occupancy

Review literature and make field observations to define known range-wide parameters

Phase 2

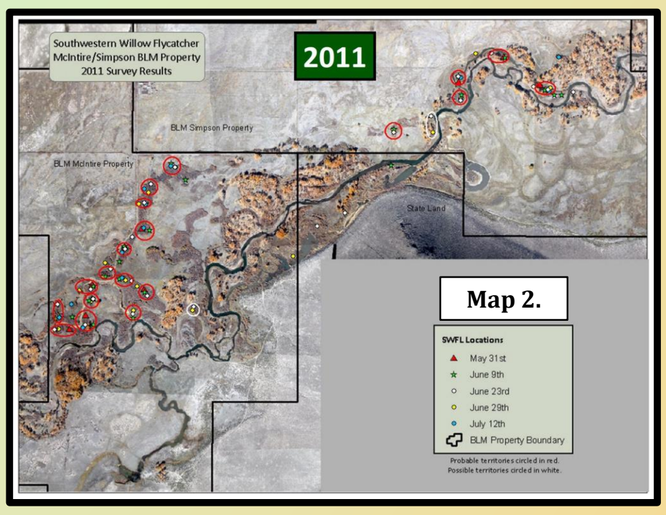
Collect Data on Three Key Parameters

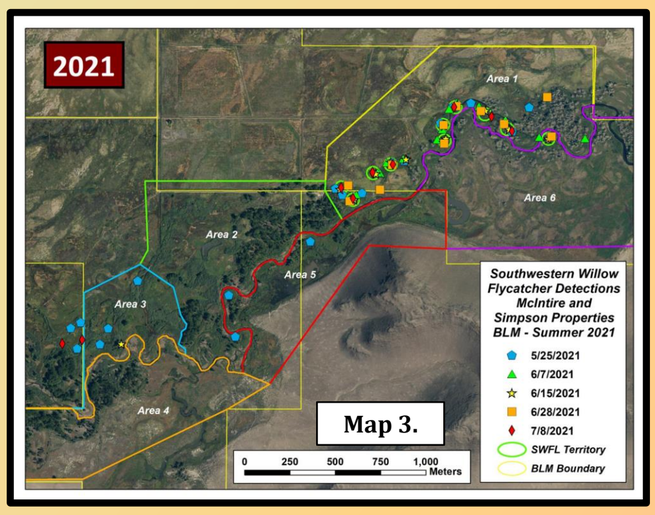
1) **Forage Availability**
2) **Vegetation Distribution**
3) **Vegetation Structure**

Phase 3

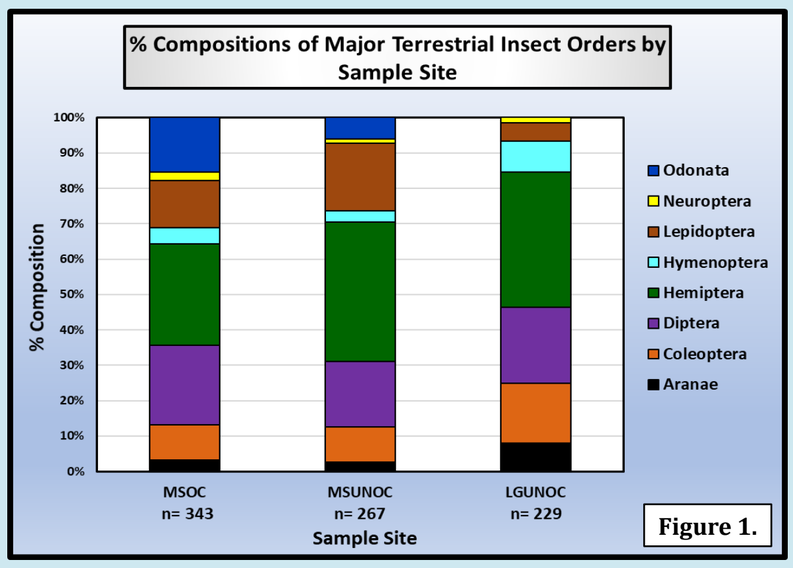
Use Data to Create and Test the Habitat Diagnostic Tool

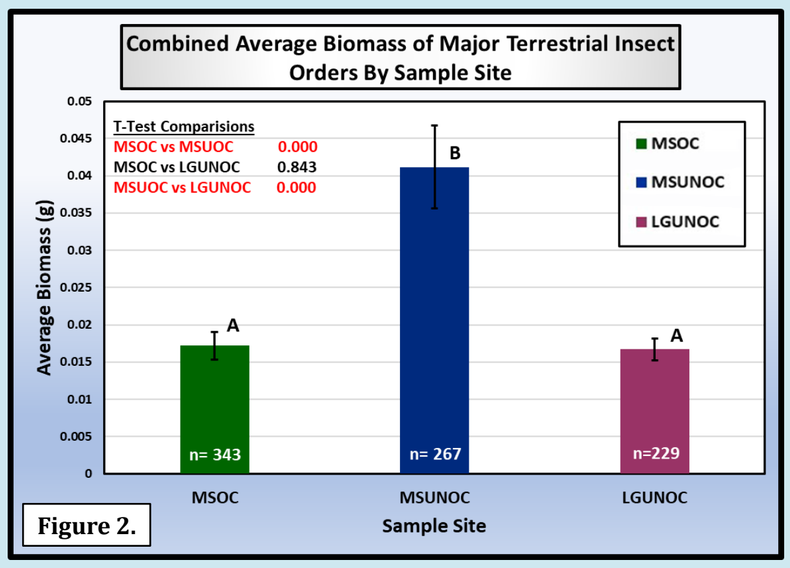
- **Define "cut-scores" for optimal or suboptimal conditions**
- **Test the diagnostic tool on potential SWFL habitat**

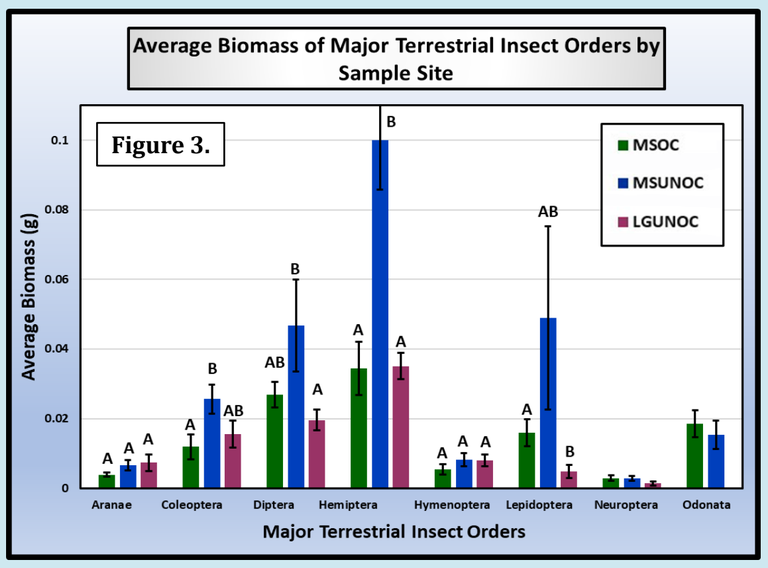




Graphs, Tables, & Diagrams Made by Student. Maps 2 & 3 Provided by Supervising Federal Agency. Map 1 & 4 Background Image Provided by Google Earth. All Photos Taken by Mentor







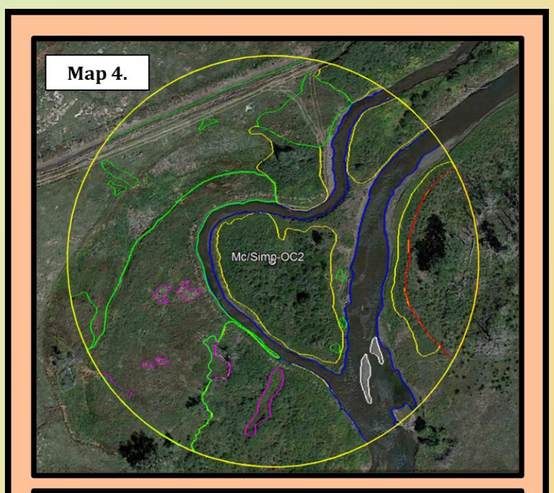
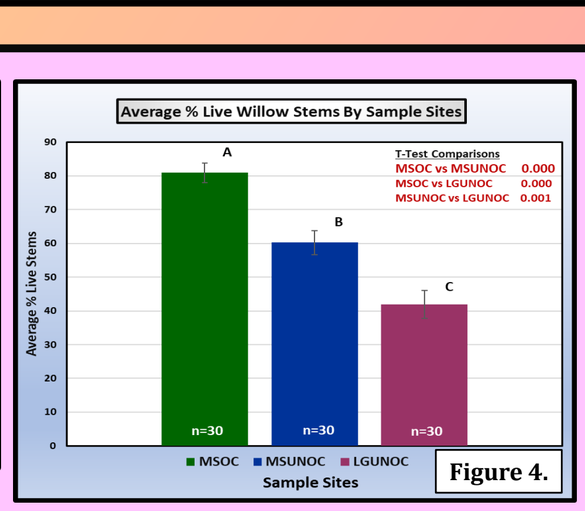


Table 1. Percent Cover of each Major Vegetation Type – Occupied vs Unoccupied Sites

Site	Willow	Forb	Grass/Sedge /Rush	Cotton-wood	Open Water	Shrub
MSOC1	21.93%	24.71%	53.36%	--	--	--
MSOC2	28.62%	24.41%	27.33%	7.35%	12.2%	--
MSOC3	35.32%	22.9%	16.49%	10.99%	14.3%	--
Average	*28.62%*	*24.01%*	*32.39%*	*9.17%*	*13.25%*	*0%*
MSUNOC1	28.93%	17.11%	53.97%	--	--	--
MSUNOC2	62.7%	21.18%	12.97%	--	3.14%	--
MSUNOC3	75.51%	7.33%	15.74%	--	1.42%	--
Average	*55.71%*	*15.21%*	*27.56%*	*0%*	*2.28%*	*0%*
LGUNOC1	13.22%	3.80%	78.7%	--	1.27%	3%
LGUNOC2	14.77%	12.05%	71.50%	--	0.75%	0.93%
LGUNOC3	15.88%	3.91%	66.29%	4.06%	2.15%	7.7%
Average	*14.62%*	*6.59%*	*72.16%*	*4.06%*	*1.39%*	*3.88%*



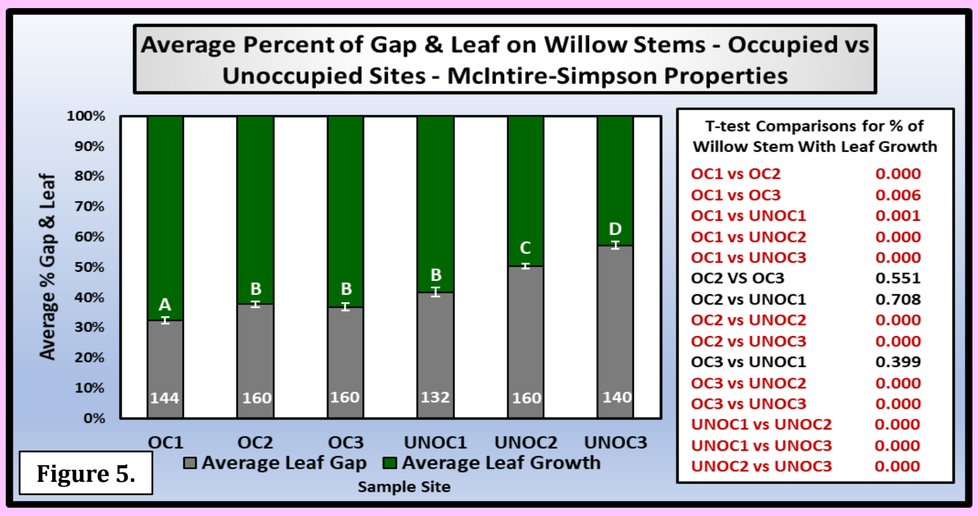


Photo 1 shows a young willow stand with full foliage growth in an occupied site. **Photo 2** shows significant leaf "gap" in a decadent stand typical of unoccupied sites.

Figure 5 displays the leaf "gap" and leaf foliage along a stem (as shown in photos 1 & 2) within the occupied and unoccupied sides of McIntire-Simpson.

- Forbs produced more insect biomass than the other vegetation types, and Hemiptera and Diptera were in highest abundance across all sites.
- Insect biomass indicated that occupied sites have less forage, possibly due to SWFL consuming some of the forage available. According to the literature and my own findings, insect biomass does not seem to impact SWFL occupancy, and the food consumed is more dependent on what is available as opposed to actual forage preferences by SWFL.
- Major vegetation percent cover indicated that SWFL seem to prefer an even distribution of several vegetation types as opposed to a dominance of a few types, or the absence of some types.
- Willow height results contradicted the literature, which state that SWFL prefer willow 3 m and taller. Data collected from the occupied site showed that SWFL will occupy willow down to 2 m in height, which establishes that SWFL in this region prefer shorter younger willow stands compared to taller, mature stands. This contradiction may be due to elevation differences, as my sites are above 2315 m. The data in established literature was collected from lower elevation SWFL sites in AZ and CA.
- Average canopy cover demonstrated that SWFL prefer a moderate canopy, as opposed to dense canopy within a stand. Percentages of live willow stems indicate that SWFL prefer a higher percentage of live stem growth compared to decadent stands with higher dead stem counts.
- Average percent leaf "gap" and leaf coverage on willow stems revealed that SWFL prefer more foliage along the majority of the stem as opposed to less foliage and leaf gap along a stem.

Chart 1. *Southwestern Willow Flycatcher (SWFL) Habitat Suitability Parameters*

Site: UTMs: Observer: Date:

		Score: (1 – Optimal (1st Box) 0 – Suboptimal (2nd Box))
Vegetation Structure	Willow Shape ☐ Coyote Willow Growth Form ☐ Peachleaf Willow Growth Form	
	Leaf Gap on Willow Stems ☐ 39% or Less ☐ 40% or Greater	
	Patch Height ☐ <2m ☐ >2m	
	Patch Diameter ☐ <10m ☐ >2m	
	Live Willow Stem Percent ☐ 70% or Greater ☐ 69% or Less	
	Canopy % Cover ☐ Between 30%-50% ☐ >50%	
Vegetation Prescence/Distribution	☐ Balanced Representation of Vegetation Types ☐ Unbalanced/Lacking Major Vegetation Types	
Forage Availability (Major Diet Taxa Biomass)	☐ Adequate representation/Biomass of Taxa ☐ Underrepresentation/Low Biomass of Taxa	
	Overall Score:	