

Putah Creek Nestbox Highway 2016 Annual Report



UC Davis Museum of
Wildlife and Fish Biology

Acknowledgements

On behalf of the UC Davis Museum of Wildlife and Fish Biology, we wish to thank everyone involved in the 2016 Putah Creek Nestbox Highway field season. We would especially like to thank Solano County Water Agency General Manager Roland Sanford and Putah Creek Streamkeeper Rich Marovich for their ongoing support and collaborative efforts to enhance Putah Creek. We also wish to thank the many generous private and public landowners who allowed us access to their properties. We are most grateful to the Putah Creek Council for organizing a community box-building day to benefit our project. We also wish to extend our gratitude to the Department of Wildlife, Fish, and Conservation Biology for project administrative support. Lastly but certainly not least, this project would not be possible without the annual dedication of our undergraduate student workforce. Thanks go out to our hard-working 2016 crew, including field assistants Dylan Hickey, Emily Wong, and Kristen Zumdahl, and student volunteers Amanda Agosta, Hanna Baek, Hanika Cook, Natasha Ekasumara, Alex Heyman, JT Love, Philipp Maleko, Tracey Rice, Jessica Schlarbaum, Temme von Lackum Dedlow, and Cooper Walton.



Hatching Tree Swallow nest. Photo: E. de Greef

2016 Results

In 2016, five species of birds successfully nested between mid-March and early August. A total of 272 clutches were produced in the 165 available boxes, excluding two House Sparrow nests that were removed prior to hatching. From these clutches, 1304 eggs were produced, hatching into 885 nestlings, resulting in 751 successful fledglings (Table 1). Tree Swallows produced the most fledglings, about 50% of the total, followed by House Wrens (23%), Western Bluebirds (21%), Ash-throated Flycatchers (5%), and White-breasted Nuthatches (1%).

Table 1. Summary and comparison of reproductive measures for 2015 and 2016

	Year	# Clutches	# Eggs	# Nestlings	# Fledglings	Hatching Success	% Change Hatching Success 2015-2016	Fledging Success	% Change Fledging Success 2015-2016
Ash-throated Flycatcher	2016	20	85	41	40	48.2%	-40.4%	97.6%	+3.7%
	2015	17	63	51	48	81.0%		94.1%	
House Wren	2016	41	259	196	174	75.7%	+4.2%	88.8%	-8.9%
	2015	32	219	159	155	72.6%		97.5%	
Tree Swallow	2016	140	643	448	371	69.7%	-5.5%	82.8%	-4.1%
	2015	144	726	535	462	73.7%		86.4%	
Western Bluebird	2016	70	311	194	161	62.4%	-14.4%	83.0%	-1.7%
	2015	43	203	148	125	72.9%		84.5%	
White-breasted Nuthatch	2016	1	6	6	5	100.0%	+25.0%	83.3%	+566.7%
	2015	2	10	8	1	80.0%		12.5%	
Total	2016	272	1304	885	751	67.9%	-8.0%	84.9%	-3.3%
	2015	238	1221	901	791	73.8%		87.8%	

*Table does not include House Sparrow clutches that were intentionally removed.

Table 1 presents summary reproductive data for the five nesting species. 2015 data was included for comparison. Although more clutches and eggs were laid in 2016, overall hatching and fledging success declined, resulting in fewer fledglings compared to 2015 (751 compared with 791). A contributing factor for this may be attributed to predation. We recorded a 48% increase in nests affected by predation in 2016.

Nesting activity came in waves, with the busiest time between mid-April and the end of May (Fig. 1). Mid-April (4/12-4/25) had the highest peak of egg-laying activity, with about 360 eggs laid. A 2nd wave of eggs followed between late May and early June (5/24-6/6), peaking at about 180 eggs. Subsequent waves of nestlings followed about one month after initial egg-laying, followed about one month later by waves of fledglings. Many pairs laid second clutches, creating secondary waves (Figs. 1 and 2).

Reproductive Productivity Throughout the 2016 Season

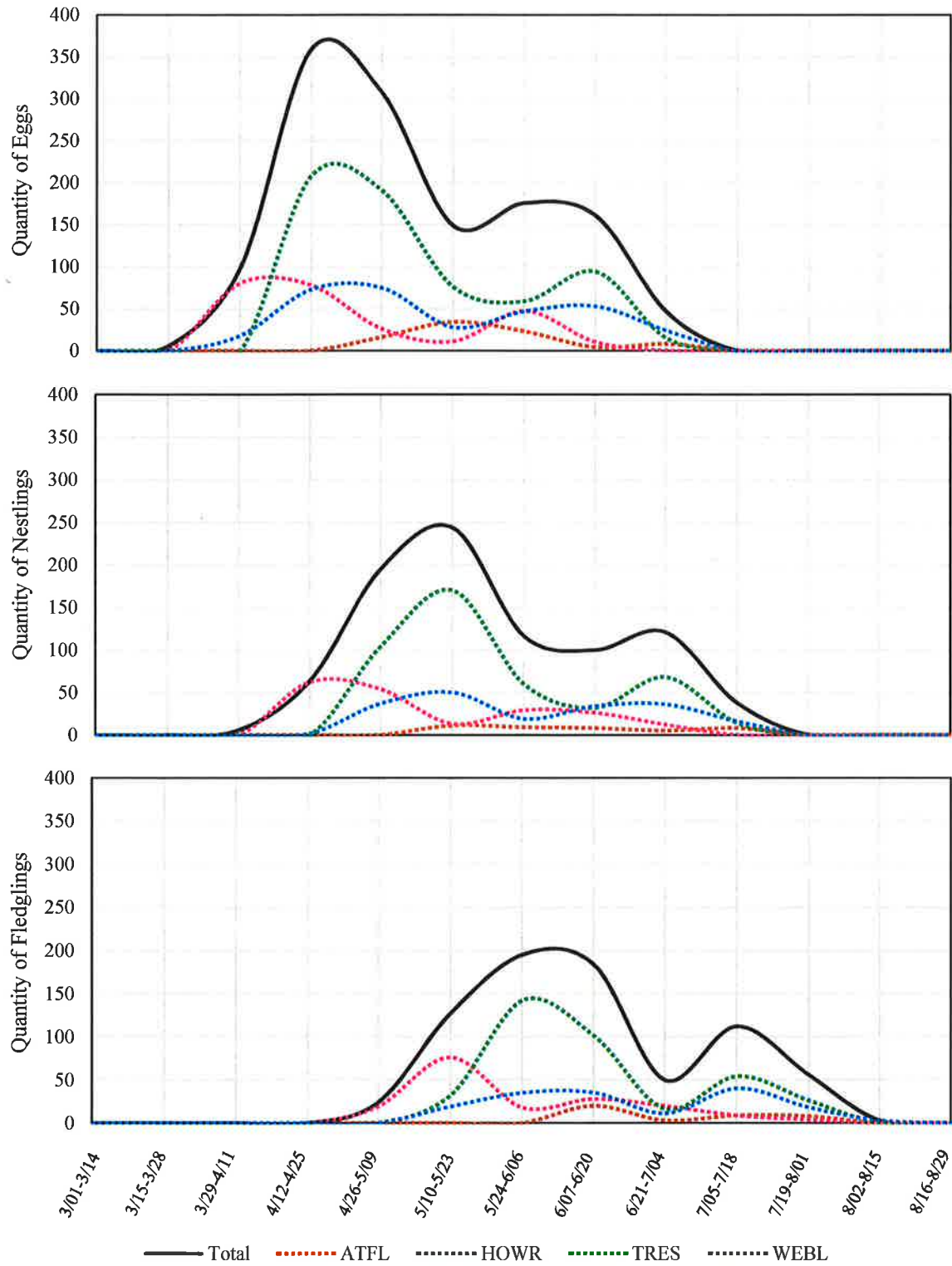


Figure 2. Reproductive productivity spread over biweekly segments, including species-level comparisons between four most productive species: ATFL=Ash-throated Flycatcher; HOWR=House Wren; TRES=Tree Swallow; WEBL=Western Bluebird.

Ash-throated Flycatcher

The latest-nesting species each year is the Ash-throated Flycatcher. This long-distance migrant spends winter months in Central America and returns by early April. Ash-throated Flycatchers started laying eggs in early May, after the first busy wave of overall nesting activity by other species (Fig. 2). From 20 clutches, Ash-throated Flycatchers produced 85 eggs, 41 nestlings, and 40 fledglings (Table 1). Although the flycatchers laid more eggs in 2016 than in 2015, their hatching success decreased by 40%, resulting in fewer fledglings compared to 2015 (Table 1). Ash-throated Flycatchers performed more nest take-overs than other species, a strategy likely used in response to their late arrival and competition for already occupied nest cavities. In the cases where they nested on top of already-existing eggs, the flycatcher eggs hatched while the previous owner's eggs did not.



ATFL take-over of TRES nest in 2016 (Left), ATFL take-over of WEBL nest in 2015 (Right).
Photos: E. de Greef

House Sparrow

House Sparrows are non-native species that can take over territories and monopolize nest boxes across seasons. Thus, we remove House Sparrow nests when they are found in our boxes. In 2016, we had only two nesting attempts, both at the Dry Creek Confluence. This was an improvement compared to the 2015 season when we encountered ten House Sparrow nesting attempts across multiple sites.



Putah Creek at Interdam Reach, Photo: E. de Greef

Table 2. Reproductive activity by reach and site, 2016

	Site	# Boxes	# Boxes used	# Clutches	# Eggs	# Nestlings	# Fledglings	
UPPER REACH	Interdam	17	14	21	109	83	82	
	Ash-throated Flycatcher			3	13	9	9	
	Tree Swallow			17	92	74	73	
	Western Bluebird			1	4	0	0	
	Diversion Dam	16	15	22	112	78	71	
	Ash-throated Flycatcher			3	14	2	2	
	House Wren			5	31	20	20	
	Tree Swallow			6	28	22	20	
	Western Bluebird			8	39	34	29	
	Dry Creek Confluence	17	17	28	122	49	36	
	Ash-throated Flycatcher			1	5	0	0	
	House Wren			2	13	1	0	
	Tree Swallow			14	57	22	22	
	Western Bluebird			9	40	26	14	
	House Sparrow			2	7	0	0	
		Upper reach total	50	46	71	343	210	189
MIDDLE REACH	Triangle Orchard	11	11	20	98	80	68	
	Tree Swallow			10	53	44	38	
	Western Bluebird			10	45	36	30	
	Russell Ranch	29	29	51	260	185	166	
	Ash-throated Flycatcher			6	27	18	17	
	House Wren			19	123	108	95	
	Tree Swallow			15	61	36	36	
	Western Bluebird			11	49	23	18	
		Middle reach total	40	40	71	358	265	234
	LOWER REACH	Picnic Grounds	29	29	54	250	173	137
Ash-throated Flycatcher				3	12	8	8	
House Wren				3	20	20	14	
Tree Swallow				30	144	104	74	
Western Bluebird				18	74	41	41	
Old Davis Rd		29	28	49	204	129	106	
Ash-throated Flycatcher				1	3	0	0	
House Wren				4	20	8	7	
Tree Swallow				32	127	93	76	
Western Bluebird				12	54	28	23	
Mace Blvd		17	17	29	156	108	85	
Ash-throated Flycatcher				3	11	4	4	
House Wren				8	52	39	38	
Tree Swallow				16	81	53	32	
Western Bluebird				1	6	6	6	
White-breasted Nuthatch			1	6	6	5		
	Lower reach total	75	74	132	610	410	328	

Arboretum Nestboxes

A few years ago, we added an additional site at the Shields Oak Grove in the UC Davis Arboretum, in partnership with the UC Davis student-led conservation group “Wild Campus.” These nest boxes have provided breeding habitat for campus birds while helping to provide education and outreach opportunities for students and the public. In 2016, Western Bluebirds occupied most of the Arboretum boxes, producing 33 fledglings (Table 3). Ash-throated Flycatchers and House Wrens both produced one successful brood.

Table 3. Nestbox results for the Arboretum, 2016

Site	# Boxes	# Boxes Used	# Clutches	# Eggs	# Nestlings	# Fledglings
Arboretum	11	6	10	49	40	40
Western Bluebird			8	41	33	33
Ash-throated Flycatcher			1	2	2	2
House Wren			1	6	5	5

Future Directions

The Putah Creek Nestbox Highway continues to supply significant long-term scientific data on cavity nesting bird population status, reproduction, phenology, and behavior. In 2016, we received generous baseline funding from the Solano County Water Agency that will help secure the future of the project over the next ten years. The project has supported two PhD students and in 2017, we will bring on a post-doctoral researcher to conduct in-depth analyses of our long-term data sets. We invite you to visit our blog: <https://mwfb-songbird-nestbox.wordpress.com>. Also, please visit the UC Davis Campus link that recently highlighted the Nestbox Highway: <http://www.caes.ucdavis.edu/news/multimedia/2016/nestbox-highway>. And as always, thank you so much for your support.



Tree Swallow pair. Photo: E. de Greef