A JOURNAL OF THE FIRST TWO PLAGUE YEARS, 2020-2021

The onset of the covid-19 pandemic in late winter 2019-2020 and the measures taken in response to it led inevitably to difficulties in maintaining our monitoring regime. At the outset it was decided that the UNR contingent (Matt Forister and Chris Halsch) would cover the 5 Sierran sites and I would continue doing the 5 lowland ones. On August 19, 2020 our Gates Canyon site was largely destroyed by wildfire. There were also significant, but much less extensive and destructive, fires at Suisun (June 8) and North Sac (July 7). The Suisun fire burned through much of the prime marsh habitat while, paradoxically, largely sparing the weedy landfill nearby.

Then, in winter 2020-21, the level of circulating virus was so high that I suspended monitoring the four remaining sites for several weeks. Instead, I tried to document first-flight dates for everything by very intensive monitoring around Davis. Thus the FFDs are not strictly comparable to other years, but it should be noted that prior-year FFDs include the transect sites but are not limited to them, so that whenever a species was first recorded somewhere other than a transect site, that date was entered—and many of these are from Davis. Regular sampling was resumed in late March, as noted below. On average I missed the first 8 visits to each site due to the pandemic.

I reconnoitered Gates Canyon and adjacent areas several times during the season and recorded everything seen (see “The Fire This Time,” posted on this site). We have not yet decided (as of 17 January) whether to resume regular monitoring at Gates in 2022. In fact, although I have visited each of the 4 remaining sites once so far, I have not yet decided whether to repeat last year’s caution and wait for local viral circulation to go down. (Needless to say, I am fully-vaccinated and boosted. Last year I got my second shot on March 9 and determined to wait two weeks or more to let the immunity solidify before resuming sampling my sites. I’m now 76 and trying to be careful without being paranoid! (NOTE ADDED JUNE 15, 2022: all 5 sites, including Gates, have been monitored in 2022.)

The 2020-21 rainfall season saw roughly 50% of 30-year mean precipitation regionally. This was reflected in stream flow and in the vegetation, which by midsummer was showing severe drought stress (both woody and herbaceous!). There was never any water in the Yolo Bypass, but the usual seasonal sequence of

butterflies in West Sacramento was not observed, and by autumn—when butterfly diversity typically peaks—nectar sources and butterflies were hard to find. Numbers of species were essentially normal all season. Numbers of individuals of most species were low to very low. This was especially the case for Pieris rapae, Pyrgus communis, Strymon melinus and Junonia coenia.

I will first report on the data routinely referenced in past "Looking Backward" articles.

Numbers of samples/site were, as noted above, reduced by the loss of the first 8 at each:

Site	2019	2020	2021 (lst date)
SM	33	29	21(iii.27)
WS	33	29	21(iii.28)
NS	33	28	21(iii.31)
RC	35	28	20(iv.1)

Maximum number of species observed on any one day during the year:

SM	20	18	17
WS	21	18	18
NS	21	23	20
RC	17	15	14

The late resumption of sampling is unlikely to have affected these species maxima since maximum numbers of species have never occurred before April 1.

MIGRATORS

Vanessa cardui had a "fair" N-ward migration in spring 2020 but was virtually absent during the typical S-ward fall movement. 2021 was always terrible. Overall, 2021 eclipsed 2018 as the worst cardui year since counts were initiated in 1988. For each site the first is the number of adults recorded before Aug.1, representing the N-ward phase; the second is the number on or after Aug.1:

RC	2020: 660,1	2021: 3,3

SM	2020: 282,5	2021: 4,4
WS	2020: 83,5	2021: 7,4
NS	2020: 328,2	2021: 3,0

For Danaus plexippus, once again no wild larvae were seen on the transect.
Adults:

RC	2020: 0	2021: 0
SM	2020: 0	2021: 4
WS	2020: 1	2021: 2
NS	2020: 3	2021: 2

Clearly, this area did not contribute to the unprecedented increase in overwintering adults currently being observed coastwise!

For Junonia coenia:

RC	2020: 74	2021: 21
SM	2020: 48	2021: 30
WS	2020: 99	2021: 35
NS	2020: 170	2021: 54

Buckeye populations never peak before April 1, so the late start of sampling is unlikely to be a factor in these declines. For comparison, one could pro-rate other years by counting only after the date of the first 2021 sample.

SPECIES PERCEIVED TO BE STRUGGLING:

Satyrium sylvinus

WS	2020: 7	2021: 3
NS	2020: 56	2021: 14
RC	2020: 4	2021: 4

Satyrium californica

RC	2020: 33	2021: 17

Ochlodes yuma

SM	2020: 3	2021: 3

Glaucopsyche lygdamus

RC	2020: 18	2021: 17
NS	2020: 5	2021: 2

Lycaena xanthoides

SM	2020: 3	2021: 1
NS	2020: 4	2021: 1

Pyrgus scriptura

WS	2020: 15	2021: 37
SM	2020: 6	2021: 11

Pholisora catullus

WS	2020: 26	2021: 26
NS	2020: 3	2021: 8

This species appears to be breeding again at NS after a brief hiatus.

SPECIES PERCEIVED TO BE DOING WELL IN RECENT YEARS:

Hylephila phyleus

RC	2020: 111	2021: 90
SM	2020: 280	2021: 212
WS	2020: 409	2021: 201
NS	2020: 216	2021: 229

Erynnis tristis

RC	2020: 58	2021: 35
SM	2020: 15	2021: 8

WS	2020: 190	2021: 68
NS	2020: 75	2021: 110
Ochlodes sylvanoides		
RC	2020: 80	2021: 104
SM	2020: 54	2021: 40
WS	2020: 40	2021: 1
NS	2020: 56	2021: 84
Poanes melane		
RC	2020: 18	2021: 4
SM	2020: 13	2021: 1
WS	2020: 11	2021: 3
NS	2020: 30	2021: 4
Limenitis lorquini		
RC	2020: 1	2021: 3
WS	2020: 17	2021: 6
NS	2020: 9	2021: 1
Nymphalis antiopa		
RC	2020: 3	2021: 0
WS	2020: 1	2021: 0
NS	2020: 4	2021: 2
Papilio rutulus		
RC	2020: 68	2021: 47
SM	2020: 29	2021: 19
WS	2020: 78	2021: 31

	NS	2020: 99	2021: 36
Papilio zelicaon			
	RC	2020: 3	2021: 1
	SM	2020: 11	2021: 15
	WS	2020: 1	2021: 0
	NS	2020: 10	2021: 13
Agraulis vanillae			
	RC	2020: 19	2021: 21
	SM	2020: 45	2021: 28
	WS	2020: 19	2021: 36
	NS	2020: 24	2021: 34

These are all multivoltine. Except for P. zelicaon, depressed 2021 counts are unlikely to reflect the late sampling start.

In addition, I decided to report counts of several species not previously itemized in “Looking Backward” to look for trends. I give counts for 2018,19,20 and 21 for these:

		18	19	20	21
Vanessa annabella	RC	0	1	0	0
	SM	5	10	2	2
	WS	1	9	3	0
	NS	2	7	4	2
Vanessa atalanta	RC	12	1	5	3
	SM	7	4	1	4
	WS	10	6	8	1
	NS	17	5	4	5

Vanessa virginiensis	RC	2	0	0	2
	SM	2	0	1	0
	WS	0	0	0	0
	NS	0	1	0	0
Strymon melinus	RC	13	46	17	16
	SM	43	58	45	52
	WS	53	77	36	26
	NS	26	50	43	50
Battus philenor	RC	646	326	347	135
	NS	17	13	29	9
Brephidium exile	SM	726	4439	10	443
	WS	26	10	5	84
	NS	2	6	88	20
Pieris rapae	RC	103	198	161	50
	SM	511	1042	472	220
	WS	942	1117	710	471
	NS	668	1250	778	517
Colias eurytheme	RC	74	96	136	78
	SM	93	299	305	111
	WS	156	364	258	303
	NS	126	249	399	215
Pyrgus communis	RC	24	64	47	42
	SM	274	438	152	211
	WS	475	617	155	284

NS	139	166	157	142
Lerodea eufala RC	0	1	3	2
SM	1	3	1	0
WS	74	10	8	0
NS	2	2	6	1
Phyciodes mylitta RC	6	8	0	0
SM	5	5	5	1
WS	2	16	3	2
NS	4	8	2	0
Lycaena helloides RC	5	5	1	1
SM	12	0	3	5
WS	63	1	1	8
NS	4	2	4	4
Polites sabuleti SM	56	13	22	26
WS	13	9	2	8

And finally, a comparison of 2019 and 2020 until the fire (viii.18) at Gates Canyon:

	2019	2020 through viii.18
Junonia coenia	145	39
Danaus plexippus	2	1
Satyrium sylvinus	8	3
Satyrium californica	11	39
Satyrium auretorum	1	2
Satyrium saepium	5	1
Erynnis tristis	40	13

Ochlodes sylvanoides	172	10
Poanes melane	33	30
Limenitis lorquini	44	19
Euphydryas chalcedona	20	37
Nymphalis antiopa	21	34
Papilio rutulus	64	43
Papilio eurymedon	8	7
Papilio zelicaon	5	2
Vanessa cardui	544	39

Of these the Satyriums, chalcedona and eurymedon were finished for the season before the fire, and sylvanoides had just started then. The others are multivoltine.

PHENOLOGY

For low-elevation site first-flight dates from anywhere, in 2020 17 species were earlier than in 2019 and 6 were later. The “average” species was 17.9 days earlier in 2020 than in 2019. In 2021 12 species were earlier than 2020 and 9 were later. The “average” species was 3.19 days earlier in 2021 than in 2020.