

Avian Population Monitoring at Carman Valley and Perazzo Meadows:2008

Summary:

Mist net monitoring of 2 meadows from the last week of May through the second week of August resulted in the capture of 872 birds. (See Tables 1, 2, 3 and Fig.1). Total numbers of adults as well as the number of hatching year birds for most species appeared to be negatively impacted by the general decline of populations in the Sierra Nevada and the severe drought conditions that existed in 2008. Orange-crown Warblers however seem to have done better than average. This species is a very early breeder at lower elevations and have been negatively impacted by April and May rains. The high number of total bird captures at these 2 sites in the early 90's was largely driven by a great abundance of Orange-crowned Warblers that boomed during the 80's-90's droughts. Their numbers declined dramatically in the late 90's when this region experienced several years of heavy spring rains, and the Orange-crowned Warbler abundance has yet to rebound to its earlier abundance.

Because the abundance of breeding birds is often affected by factors independent of each site's specific habitat suitability, we looked at the proportion of captures during post breeding dispersal in July versus the number of birds captured during the June breeding season (Fig. 2). Despite the severe drought conditions the restored Knuthson Meadows in Carman Valley remained more productive throughout the end of July compared to pre-restoration years and continued to serve as a resource for both adults and juveniles during post breeding dispersal. In contrast Perazzo Meadows continued to decline as a resource for birds during post breeding dispersal.

Table 1 : Total Captures by Age and Station

<u>STATION</u>	<u>AGE</u>	<u>Total</u>
CAVA	ADULT	349
CAVA	HY	150
CAVA	U	1
PZAZ	ADULT	236
PZAZ	HY	135
PZAZ	U	1

Results and Discussion

The 2008 season had the lowest snow pack in 20 years. After heavy snows in early January there was virtually no further precipitation other than a week of rain during the last week of May. This was the first time that a small feeder stream entering Knuthson Meadows in Carman Valley had completely dried up by mid May since the study began in 1992. However the main restoration ponds remained full throughout the summer, being fed from underground flows.

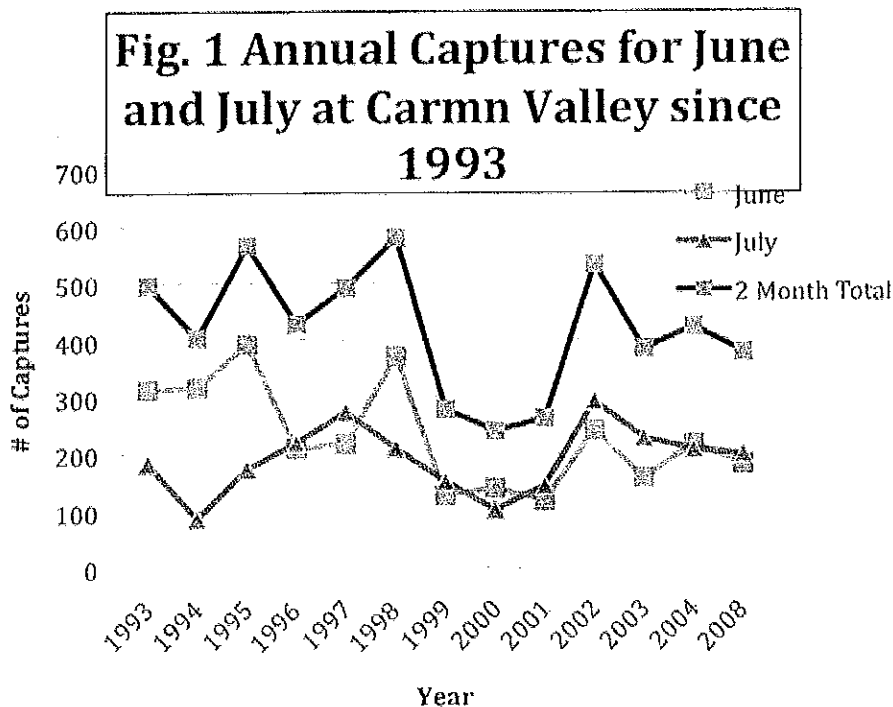
It is difficult to discern what factors contributed to the changes in the breeding abundance in each specific meadow. However for the great majority of bird species in these meadows, BBS data shows there are strong region-wide negative trends (Table 4). And this BBS data suggests that other factors, not specific to either meadow, are responsible for much of the observed declines since 1993 (Fig. 1).

However these trends do suggest that the increased captures that followed the restoration of Carman Valley in 2002 are very likely due to site specific factors. The negative BBS trends from 2000 to 2007 indicate that the negative trends have continued in the Sierra Nevada and an even greater proportion of the bird populations are declining. Yet since the restoration, there was been definite increase in captures at Carman Valley from the 1999-2001 lows and that increase has been sustained despite the general Sierra Nevada wide declines.

Table 4. BBS Trends for the majority of Species captured at Carman Valley

<u>SPECIES</u>	<u>% OF TOTAL CAPTURES</u>	<u>BBS SIERRA NEVADA TREND 1993-2007</u>	<u>P-VALUE SIGNIFICANCE</u>	<u>BBS SIERRA NEVADA TREND 2000-2007</u>	<u>P-value</u>
OCWA	17.2	-3.20	P=0.50	-11.2	P=0.19
*OCWA(breeding grounds)		-3.41	P=0.001	4.40	P=0.13
ORJU	8.5	-1.49	P=0.08	-3.88	P=0.02
MGWA	7.6	-2.87	P=0.20	-2.50	P=0.32
*PISI	4.0	-13.09	P=0.01	-15.24	P=0.13
PUFI	4.0	-1.69	P=0.59	2.40	P=0.60
*WAVI	3.9	-2.57	P=0.006	0.45	P=0.81
GRFL	3.7	-2.26	P=0.19	4.42	P=0.71
CAVI	2.6	-0.51	P=0.74	-1.38	P=0.34
DUFL	2.4	-3.32	P=0.08	-1.26	P=0.62
LISP	2.0	-4.49	P=0.38	-0.06	P=0.99
HOWR	1.5	-4.83	P=0.15	-4.82	P=0.47
NAWA	1.5	-0.84	P=0.56	2.22	P=0.34
BHGR	0.5	-0.90	P=0.41	1.02	P=0.61
% of All Species with Negative Trend			1993-2007: 59.4%,	2000-2007: 62.9%	

SOSP	9.7	1.66	P=0.29	-3.87	P=0.33
YWAR	6.2	0.17	P=0.95	-2.04	P=0.49
GTTO	3.7	3.40	P=0.22	2.24	P=0.31
MOCH	3.6	0.98	P=0.52	3.13	P=0.13
CHSP	1.6	0.46	P=0.81	3.56	P=0.23
WEWP	1.2	0.74	P=0.44	-1.70	P=0.30
*WETA	0.5	2.07	P=0.0007	-0.36	P=0.54
% of All Species with Positive Trend			1993-2007: 26.5%,	2000-2007: 24%	

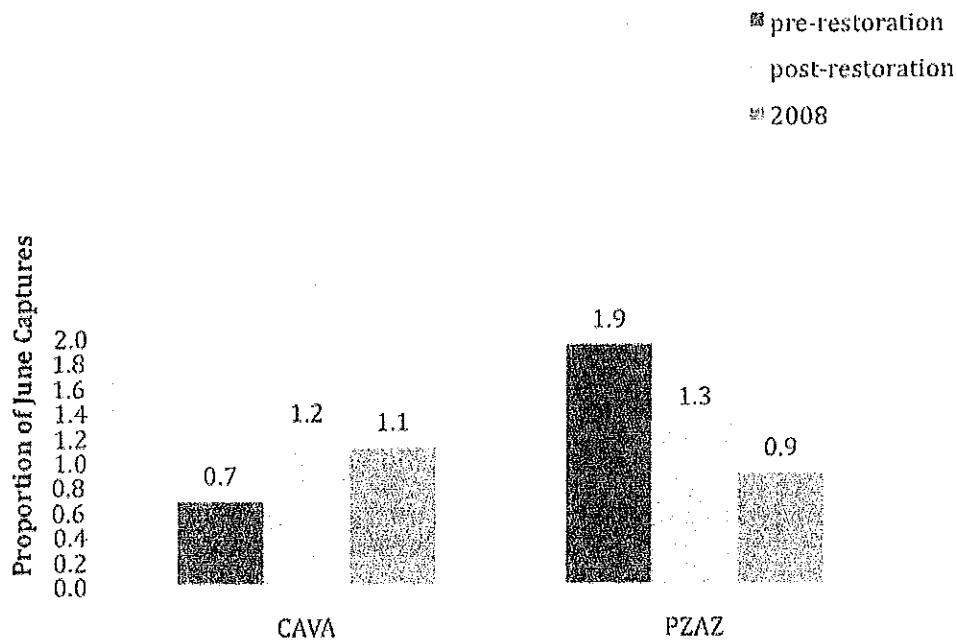


One prediction made prior to the restoration of Carman Valley was that birds would remain for a greater length of time after the restoration. When the hydrology was disrupted there were dramatic declines beginning in July suggesting that the meadow could not supply the needed resources to sustain the avian populations. The number of birds captured in July and August are dependent upon two general factors. First the abundance of the breeding populations in the area and second the condition of the meadow. With improved hydrology we expected willow growth and insect abundance to be sustained for a greater duration.

Because the June breeding populations have declined, we would also expect the abundance in July to decline as well. This confounds the analysis regarding improved hydrological conditions. In order to control for changes in breeding populations, we looked at the proportion of birds that used the meadow in July relative to the number of bird that were using it in June.

With the fledging of young in late June and July we would expect overall captures to increase. However as illustrated in Figure 2, during the pre-restoration conditions at Carman Valley, 1993-2001 indicated significant decreases in July. Only after the restoration do we witness a relative increase in use of Carman Valley in July. And this pattern was maintained in 2008.

Fig. 2 Total July Captures as a Proportion of June Total Captures at 2 Monitoring Sites since 1993



The decline in the use of Perazzo Meadow is somewhat more mysterious. From 1993 -2001 the use of Perazzo Meadow nearly doubled in July. Perazzo Meadow is higher in elevation and in some years still has snow-covered willows in early June. Carman Valley in contrast is always snow free by the first of May. The marginal breeding conditions at Perazzo Meadow reduce the breeding numbers in June.

However as the lower elevations begin to dry during the summer drought many birds, especially juveniles move upslope. In heavy snow years where vegetation gets a late start and lower elevations have more moisture, the movement upslope has been less dramatic. However in dry years with low snow pack, the upslope movement has been quite significant.

The 2008 season had a very low snow pack, yet the number of birds moving upslope was atypically low and continued to exhibit a declining trend that began in mid 90's. The most likely reason can be attributed to the overall general decline in most bird populations in the Sierra Nevada. However to have the proportion of July birds less than the June breeding populations suggest that Perazzo Meadows may not be as productive as it once was.

That Perazzo Meadows may be marginal habitat for most species is further suggested by the fact that in June we failed to recapture any returning birds that were banded in 2004 or earlier. Over that four year period we would expect to lose a large percentage of the previously banded birds. But their total absence was striking. We did finally have two old recaptures in July, but this late date suggests that they were birds that disperse through the meadows. This was not the case at Carman Valley as we captured many more old returning birds. We will analyze the recapture data more thoroughly at a later date.

Appendix:

Table 2 : Total Captures by Capture Status and Station

STATION	Capture Status	Total
CAVA	New	356
CAVA	Recapture	144
PZAZ	New	287
PZAZ	Recapture	85

Table 3: Summary of captures by Station and Species and Age.

STATION	SPECIES Code	AGE	Total Captures
CAVA	AMRO	ADULT	17
CAVA	AMRO	HY	2
CAVA	AUWA	ADULT	3
CAVA	AUWA	HY	3

CAVA	BHCO	ADULT	6
CAVA	BHCO	HY	3
CAVA	BHGR	ADULT	9
CAVA	BHGR	HY	2
CAVA	BLPH	ADULT	1
CAVA	BLPH	HY	1
CAVA	BRSP	HY	1
CAVA	CAVI	ADULT	7
CAVA	CAVI	HY	2
CAVA	CHSP	ADULT	1
CAVA	DUFL	ADULT	6
CAVA	DUFL	HY	2
CAVA	FOSP	ADULT	1
CAVA	FOSP	HY	3
CAVA	GRCA	ADULT	1
CAVA	GRFL	ADULT	1
CAVA	GTTO	ADULT	12
CAVA	GTTO	HY	5
CAVA	HEWA	ADULT	5
CAVA	HEWA	HY	1
CAVA	HOWR	ADULT	2
CAVA	LAZB	ADULT	1
CAVA	LAZB	HY	2
CAVA	LEGO	ADULT	4
CAVA	LEGO	HY	2
CAVA	LISP	ADULT	3
CAVA	LISP	HY	4
CAVA	MGWA	ADULT	12
CAVA	MOCH	ADULT	15
CAVA	MOCH	HY	9
CAVA	NAWA	ADULT	2
CAVA	NAWA	HY	1
CAVA	OCWA	ADULT	64
CAVA	OCWA	HY	27
CAVA	OCWA	U	1
CAVA	ORJU	ADULT	7
CAVA	ORJU	HY	21
CAVA	PISI	ADULT	2
CAVA	PSFL	ADULT	1
CAVA	PUFI	ADULT	6
CAVA	PUFI	HY	3
CAVA	RBNU	ADULT	1
CAVA	RBNU	HY	3
CAVA	RBSA	ADULT	12
CAVA	RBSA	HY	3
CAVA	RWBL	ADULT	3
CAVA	RWBL	HY	1
CAVA	SAVS	HY	7
CAVA	SOSP	ADULT	70

CAVA	SOSP	HY	38
CAVA	VESP	HY	1
CAVA	WAVI	ADULT	25
CAVA	WAVI	HY	2
CAVA	WETA	ADULT	5
CAVA	WEWP	ADULT	8
CAVA	WIFL	ADULT	1
CAVA	WIWA	ADULT	2
CAVA	YWAR	ADULT	33
CAVA	YWAR	HY	1
PZAZ	AMRO	ADULT	8
PZAZ	AUWA	ADULT	4
PZAZ	AUWA	HY	1
PZAZ	BHGR	HY	4
PZAZ	BRSP	ADULT	1
PZAZ	CAFI	ADULT	2
PZAZ	CAVI	ADULT	1
PZAZ	CAVI	HY	1
PZAZ	CHSP	HY	2
PZAZ	DUFL	ADULT	17
PZAZ	GTTO	HY	1
PZAZ	HAFL	ADULT	2
PZAZ	HOWR	HY	1
PZAZ	LAZB	ADULT	4
PZAZ	LAZB	HY	4
PZAZ	LISP	ADULT	11
PZAZ	LISP	HY	3
PZAZ	MGWA	ADULT	5
PZAZ	MOCH	ADULT	1
PZAZ	MWCS	ADULT	40
PZAZ	MWCS	HY	18
PZAZ	NAWA	ADULT	1
PZAZ	NAWA	HY	2
PZAZ	OCWA	ADULT	20
PZAZ	OCWA	HY	48
PZAZ	OCWA	U	1
PZAZ	ORJU	ADULT	2
PZAZ	ORJU	HY	16
PZAZ	PISI	ADULT	1
PZAZ	PUFI	HY	1
PZAZ	RBSA	ADULT	14
PZAZ	RBSA	HY	14
PZAZ	SAVS	ADULT	2
PZAZ	SAVS	HY	2
PZAZ	SOSP	ADULT	31
PZAZ	SOSP	HY	12
PZAZ	STJA	ADULT	1
PZAZ	WAVI	ADULT	7
PZAZ	WETA	ADULT	1

PZAZ	WEWP	ADULT	2
PZAZ	WIFL	ADULT	4
PZAZ	WIWA	ADULT	22
PZAZ	YWAR	ADULT	32
PZAZ	YWAR	HY	5