Chrysididae (cuckoo wasps) (Figure 2). Preliminary identification based on field observations and comparison to known arthropod species from taxonomic records has indicated that in excess of 300 arthropod species were collected near these water sources. A complete list of taxa is pending further identification by specialists in Hymenoptera and dipterans.

Analyses are as yet incomplete and it is unknown what proportion of biodiversity and what species were missed by limited sampling. Our sampling did, however, suggest there may be a higher arthropod diversity at the sites without grazing presence as compared to sites with evidence of cattle impacts, which corresponded to observations of greater vegetation cover, lower water turbidity, and less evidence of trampling at sites without cattle. Existing exclosure fences had been successful at preventing cattle ingress to the water source at the two sampling sites we observed with fences. Greater numbers of pollinator insects and natural enemy insects (i.e. those which tend to reduce the reproductive success of other insects) were noted in the undisturbed zones inside the fenced exclosures. Higher levels of natural enemy insects may reduce pestiferous populations such as biting flies and mosquitoes in the vicinity of springs. Fewer species overall were sampled at water sources utilized by cattle and the spring source areas tended to show more signs of cattle trampling. Most of the water sources utilized by cattle have pipes and troughs that divert water for livestock. These diversions appear to reduce flow in the small wetland zones around spring water sources. Samples from sites with cattle tended to have higher levels of biting flies, fecal feeders, and gnats compared to sites enclosed by fences and those without cattle. These initial results, however, represent preliminary indications and are inconclusive pending additional sampling and complete analysis of the data.

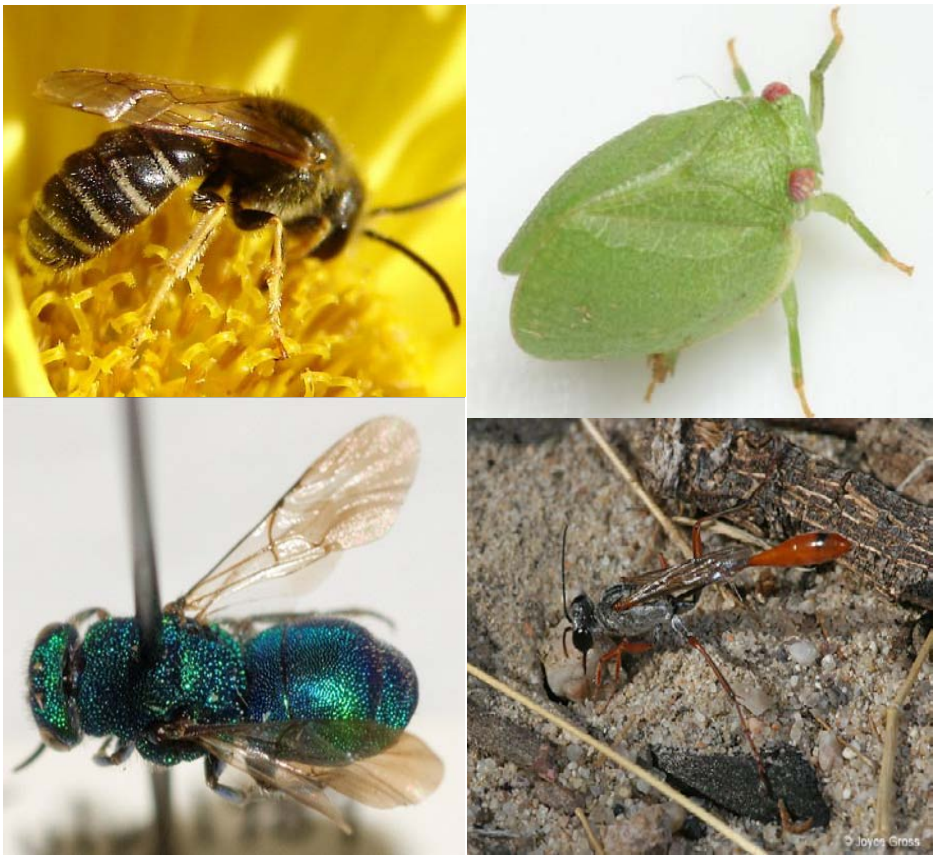

Figure 2. Examples of insect specimens recovered from the water and sticky traps deployed around Mojave National Preserve springs: *Halictus ligatus* (top left), plant hopper [Acanaloniidae] *Acanalonia* (top right), [Chrysididae] (bottom left) and *Ammophila* (bottom right).

A surprising and significant finding of this study was the first detection record in Mojave National Preserve of spotted wing drosophila, *Drosophila suzukii* (Matsumura) (Diptera: Drosophilidae), an invasive species from Asia (Figure 3) that has been destructive in fruit orchards in western California. After its recent introduction into the U.S., spotted wing drosophila has been tracked across California, Oregon, Washington, Florida, North Carolina, and Michigan. Six specimens of spotted wing drosophila were collected at the Arrowweed Spring

					Vegetation Cover (%)		
Name of water source	***Date***	***Elev. (m)***	***Excl.***	***Cattle***	***Water Course***	***Bank***	***Overall***
Arrowweed Spring	1-5	1207	Yes	No	90	60	75
Bathtub Spring	1-4	1772	No	No	20	40	30
Cedar Canyon Rd. Seep	1-4	1558	No	Yes			5
Ivanpah Spring	1-4	1295	No	Yes	15	60	30
Live Oak Spring	1-4	1512	No	No	80	50	70
Mail Spring	1-5	1527	Yes	No	40	60	50
Piute Spring	1-4	829	No	No	90	45	80
Rock House Wash	1-4	1550	No	Yes	10	25	15
Silver Lead Spring	1-5	1623	No	Yes	10	20	15
Wild Horse Canyon Rd.	1-5	1661	No	Yes	30	40	35

Table 1. Arthropods were collected at 10 water sources in Mojave National Preserve on sample dates: 1 (July 21-22, 2008), 2 (July 28-29, 2008), 3 (Aug. 4-5, 2008), 4 (May 22-23, 2009), and 5 (Apr. 17, 2010). Vegetation cover was estimated within the wet area of the water course, along the riparian bank, and for the spring site overall. Presence of cattle and a fenced exclosure were noted.