



December 3, 2018

To: Rich Marovich

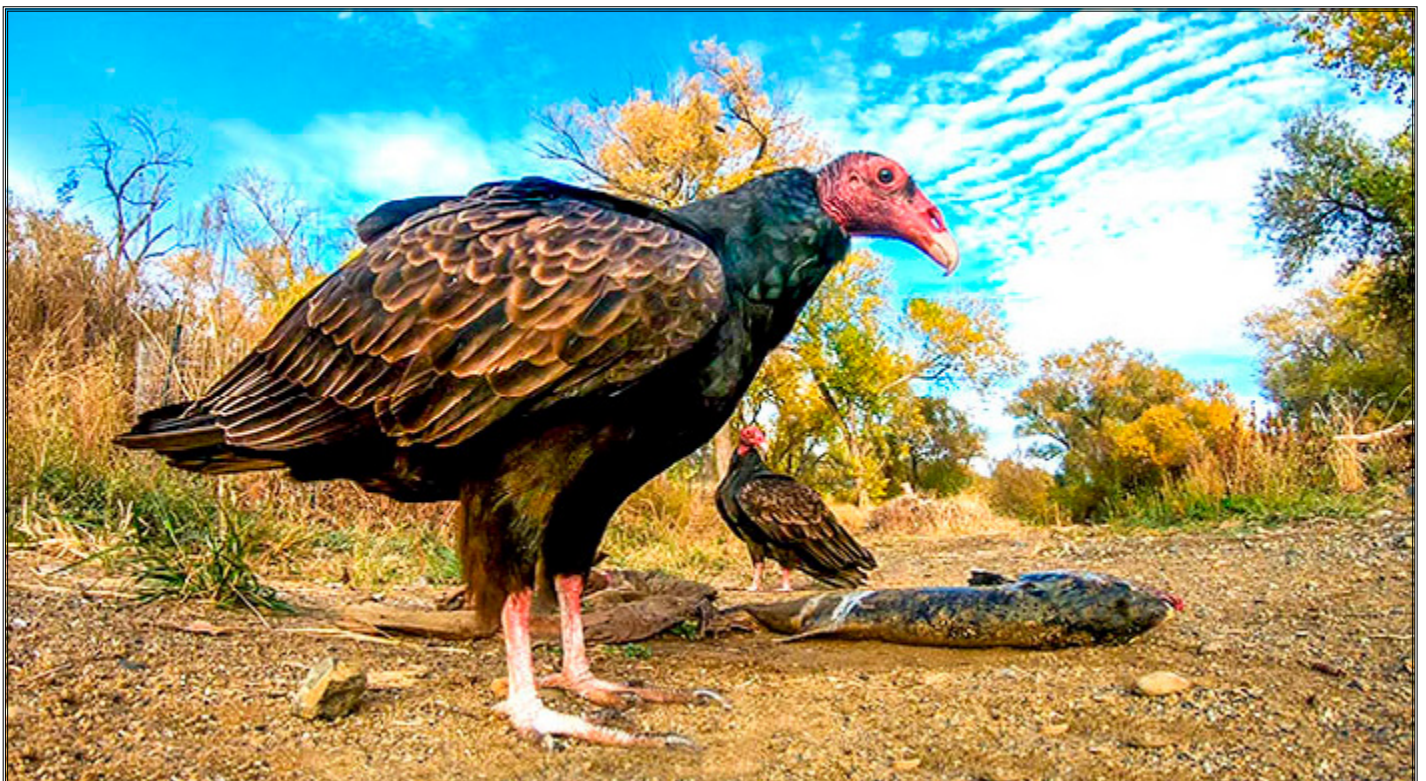
From: Ken W. Davis, aquatic biologist

### UPDATE # 3: Salmon in Lower Putah Creek

The current adult salmon count - effective 12/3/2018 - is **483+**

*(Note: The salmon count is based on frequent (every day when possible) creekside observations, salmon appearance and behavior, comparative subsurface video footage and communications with Rick Fowler. Those parameters are mentioned in this document and will be fully addressed in my final report.)*

- 1. Updated salmon count:** The current adult salmon count was conducted between the Putah Diversion Dam and the creek split just downstream from I-505. Our count of 483+ is a firm number due to the intensity of the surveys, the methodology used and documentation provided by subsurface video footage.
- 2. Salmon Carcasses & Scavengers:** Because research has documented the importance of salmon carcasses to a wide variety of wildlife, I decided to deploy video cameras (Game Cameras) at selected locations. There is also significant information that documents the increase of Benthic Macroinvertebrate populations in streams that support spawning salmon. Apparently, caddisfly (Tricoptera), scuds and certain other invertebrates benefit significantly. Ancillary research also shows that passerine bird populations can also increase. While we know the list of scavengers that will possibly be feeding on dead salmon, I was more interested in determine the length of time that carcasses might be totally removed and / or consumed.



Turkey vultures feeding on salmon carcasses removed by unidentified scavengers. File 6577. 11/26/2018





3. **Carcasses removed by Scavengers:** In a casual survey on 11/30/2018 along the access road from the Pickerel Property through Morales, I located 21 salmon carcasses. They were located from 5 feet to 30 feet from the creek. Note this casual survey was conducted in areas with thick overgrowth where a comprehensive survey would be difficult. Most of the decaying fish were found primarily by odor. Of the carcasses found, only one (1) had a plastic tag that identified it as a U. C. Davis processed salmon. See image below.



4. **Video monitoring of salmon carcasses:** Video cameras are set up on fish that have already been moved from the creek by various wildlife. To date, the scavengers have included raccoons, turkey vultures, coyotes, and mink. Otters and bobcat are suspected to also participate in feeding on the salmon. On 11/30/2018, I saw an adult bald eagle fly over the Pickerel Property.







5. **Appearance of new (recently arrived on spawning beds) salmon versus spawned fish:** Observing new fish that have recently arrived in the spawning area is important to effectively counting the salmon that arrive in several waves. It should be noted that the salmon count is not as important to the Scarification Project as identifying where the fish are spawning, possibly why they choose certain areas, and what we can do to improve the areas for spawning success. Rick Fowler's participation is important to this effort due to his desire to improve the scarification process when possible.

I have provided below examples of "newly arrived" salmon (11/30/2018) that exhibit appearances which support my contention. For example, note the lack of scars or other marks on the female that show she has not damaged her tail by digging a redd (black arrow). She also has a bulging abdomen that shows she still has eggs (yellow arrow). Likewise, the male does not have any marks that would suggest he had been fighting with other males. I will provide comparative images in the final report.





6. **Value of Video Documentation:** The value of sub-surface video documentation will be fully developed in the final report. During the 2018 salmon spawn, we have documented that juvenile salmon (2917 spawn) are common in the first four miles of the creek. They have been filmed on several occasions feeding on salmon eggs - or staging to feed on eggs - within active salmon redds. The video clearly shows that the small salmon are active and healthy. We have also documented on four occasions exactly - with date and time - when the salmon spawn. As in the past, we have recorded where the salmon dig redds and the quality of those redds. It is important to note that in areas scarified, the salmon frequently spawn the same day they arrive on the spawning beds.

Submitted via e-mail 12/3/2018:

**Ken W. Davis**

Aquatic biologist / Wildlife Photojournalist

Wildlife Survey & Photo Service

2443 Fair Oaks Blvd. No 209

Sacramento, CA 95825

(916) 747-8537

ken@creekman.com

www.creekman.com



Female salmon carcass that shows the typical damage to the tail area due to redd digging activities.