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June 7, 2016

To: Mr. Richard Marovich, Putah Creek Streamkeeper

Subject: ***Letter From Mr. David Springer (Winters Friends of Putah Creek) dated May 23, 2016***

The purpose of this document is to address some of the points in the above mentioned letter to Mr. Roland Sanford, that shall be referred to as the **Springer Letter**. Please note that I do not in any manner represent the Solano County Water Agency (SCWA), the Lower Putah Creek Coordinating Committee (LPCCC) or any agent or individual of those organizations. As an independent contractor (Aquatic biologist / Wildlife Photojournalist) the opinions stated below are mine. All images used in these document are copyrighted and may not be reproduced without my written permission. However, you certainly have my permission to share this document with your board(s), any governmental agency, and the public. Note that I have not been paid, nor will I be paid to write this letter. I want to address the **Springer Letter** on four distinct levels. All are based on science or photo-documentation:

A. **The Benthic Macroinvertebrate community in Putah Creek:** Specifically Phase 3 of the Winters Putah Creek Park. My comments are based on thirty years of studying freshwater aquatic habitats with a heavy emphasis on benthic macroinvertebrates (aquatic insects).

B. **Uninformed or unsupported statements:** Several unsupported statements and selective partial quotes appear to be misleading. Based on my long-term knowledge of the entire Putah Creek watershed.

C. **Wildlife Observations:** Claims that Phase 3 is a "Unique opportunity for people to view animals living in their natural surroundings." Comments are based on my extensive background and on-going career as a professional wildlife photojournalist and consultant to eco-tourism organizations.

D. **Successful Restoration Projects in Lower Putah Creek:** Images and comments about the Winters Putah Creek Park (WPCP) Project and other Putah Creek restoration projects that demonstrate continuing success. This simply demonstrates the wealth of success and progress that the LPCCC and SCWA have achieved. My opinions are based on direct participation in Putah Creek projects, experience with other restoration projects and visiting numerous environmental initiatives across the nation.

2015 Spawning Chinook salmon at Neil Crossing in Phase 1 - Winters Putah Creek Park. © Ken W. Davis

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Section A: Benthic Macroinvertebrates / Aquatic Invertebrate Community:

Benthic Macroinvertebrates and aquatic invertebrates are possibly the best measure of the health of any freshwater system. The state of the benthic macroinvertebrate community reflects the state of the entire ecosystem (Reice 1993). For the purposes of this document, I will use the term "aquatic invertebrates" to represent both groups because it includes species that might not inhabit benthic environments. Because aquatic invertebrates consistently occupy habitats being surveyed they are a great measure of current conditions, recent changes and long-term environmental status. In general they can not make significant movements within the watershed that fish or other wildlife might make.

Example of an adult mayfly (*Siphlonurus sp)* from Putah Creek that is prime trout food. 2013 © Ken W. Davis

Aquatic Invertebrates in the Putah Creek Watershed:

I have sampled, collected and photographed aquatic invertebrates within the entire Putah Creek watershed from the origin springs on Cobb Mountain to the Delta and the majority of perennial and intermittent tributaries. The Putah Creek watershed is complete with common, unusual, and somewhat rare invertebrates. I have expertise in developing sampling programs, collection protocols, and invertebrate taxonomy. My experience includes collecting invertebrates in more than 600 named and unnamed waterways on the West Coast and the Rocky Mountains. I have some experience on East Coast streams. I have written numerous articles on aquatic invertebrates and for several years wrote a column on aquatic invertebrates, their ecology, morphology and behavior for the ***Flyfisher***, an international fly fishing magazine. I routinely give presentations to fly fishing clubs, civic groups, and scientific conventions about my work. I am a member of several scientific organizations and routinely attend science-based seminars and workshops. I am currently writing and photographing a Manual of Aquatic Invertebrates for Northern California.

Aquatic Invertebrates in Lower Putah Creek:

As a whole, the aquatic invertebrate community in Lower Putah Creek is impacted by a condition called cementation. However, research has shown that high-value invertebrates are capable of thriving in Lower Putah Creek if the cementation condition is remedied (Davis 2006). I have monitored the invertebrate community in Lower Putah Creek for approximately 13 years, more than 20 years if we include microscopic organisms such as protozoans.

Overall, the aquatic invertebrate community in Lower Putah creek from the Putah Diversion Dam to I-505 (except Phase 3) is of reasonable quality. Multiple restoration projects including the on-going enhancement of Winters Putah Creek Park (Phase 1 and 2) have increased the range of several sensitive invertebrates that have similar requirements to rainbow trout. I suspect that a significant flood (scouring) event will dramatically improve the entire creek as well as Phase 1 and Phase 2. A scouring event can also improve conditions necessary for many species of the invertebrate community.

Phase 3: Image of Phase Three facing upstream. Image shows the dominant water plant Myriophyllum sp., an invasive species which is considered a noxious aquatic weed. This image is important because it shows the lack of diversity, the high banks, and lack of riparian cover. Image taken from kayak on 6/22/2016.

Winters Putah Creek Park: Phase 3:

I have been monitoring the section known as Phase 3 since 2004 primarily determining the impact of the invasive New Zealand Mudsnail on native invertebrates. I typically collect samples (under the provisions of a CDFW Scientific Collection Permit) at least once per quarter. My latest collection was May 31, 2016. "Because aquatic insects are, to a large degree, responsible for converting plant materials into animals tissue in freshwater ecosystems, they can be of immense importance in the food chain leading to fish productions (McCafferty 1998). Aquatic invertebrates are also be essential as food resource for other riparian wildlife include many bird species. That fact has been well documented in several Putah Creek restoration areas.

Collection Results:

Phase 3 has a highly limited community of aquatic invertebrates that is characterized by species that are considered "Low quality" regarding tolerance to organic pollution and value to wildlife. A sample of Phase 3 is typically dominated by Water Boatmen (Corixidae), leeches, scuds, and an occasional mayfly that like slow water and weedy conditions. The diversity of aquatic invertebrates in Phase 3 is extremely low when compared to the rest of Putah Creek. Phase 1 and Phase 2 are more diverse than Phase 3.

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Section B: Misleading Statements within the Springer Letter:

MISLEADING STATEMENT IN SPRINGER LETTER # 1:
"This section of the creek hosts an abundance of wildlife, including beaver, otter, mink, pond turtles, egrets, herons, geese, and kingfishers that is rare in the previously restored creek sections"

KEN DAVIS COMMENT:
The above named wildlife species are rather common throughout Lower Putah Creek. I have seen all of those species and others in Phase 1 and Phase 2. Because most of the species named above are mobile, they can move throughout all three WPCP phases and beyond. The birds fly and mink and otters have territories (home ranges) that in some cases include several miles of riparian area. To imply that mink and otters are limited in other areas or exclusive to Phase 3 (estimated 0.25 mile in length) is uninformed and misleading. Mink are well known to have home ranges up to 3.5 miles, with males sometimes having larger territories. River otters can also have extensive home ranges depending on food resources and other factors.

Beaver are also common in other areas of Lower Putah Creek.

Black-crowned Night Heron: Photographed in Lower Putah Creek near Yolo Basin wetlands

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MISLEADING STATEMENT IN SPRINGER LETTER # 2:
"The existing oasis of biological diversity will be eliminated by the current plan."

KEN DAVIS COMMENT:
The aquatic diversity of species and habitat in Phase 3 is severely limited. The main aquatic plant species is *Myriophyllum,* an invasive noxious weed. The image below speaks volumes. The dewatered section clearly shows a flat, featureless creek bottom. Contrary to the **Springer Letter**, I expect the "biological diversity" to ultimately increase under the current plan for Phase 3.

Phase 3 - Downstream Section: *Taken during the construction phase, this image was taken from video recorded on 10/11/2011. Looking downstream, you can see the crossing between Phase 3 and Phase 2 at the end of the pipes.*

MISLEADING STATEMENT IN SPRINGER LETTER # 3:
"According to the USDA Natural Resources Conservation Services, " Good trout stream habitat is complex, consisting of an array of riffles and pools, submerged wood, boulders, undercut banks, and aquatic vegetation." The Springer Letter also claims that "Phase 1 & 2 are devoid of complexity and lack the large pools, fallen logs, islands, high undercut banks and habitat complexity of the Phase 3 unimproved section."

KEN DAVIS COMMENT:
Phase 3 cannot be considered as "trout stream habitat" as implied in the **Springer Letter**. The document cited above in the **Springer Letter** is provided with this letter. Unfortunately, the citation is significantly misleading by leaving out important factors for good trout stream habitat that are mentioned in the quoted article: water temperature, appropriate riparian cover, adequate streambed cobble, floodplain management, spawning habitat, and food resources such as certain larval and adult aquatic insects. None of those factors exist in Phase 3.

During the last four years, I have conducted intensive surveys using subsurface video of fish species and habitat within the Lower Creek. The purpose was to determine, when possible, the habitat being used by aquatic species. During the on-going surveys, I've determined that Phase 3 is characterized by a muddy bottom that is dominated by Myriophyllum. There certainly are high banks (too high) and woody material that is primarily Eucalyptus. The only riffles in the WPCP are in Phase 1 and in Phase 2. There is NO riffle habitat(s) in Phase 3. The riparian vegetation in Phase 3 is basically dominated by invasive species: Eucalyptus, Himalayan Blackberries, Arundo, and Tree of Heaven.

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Phase 1: *Image taken in Phase One (11/10/2015) just downstream form the Winters Bike Bridge. The section has a complex system of boulders, root wads and some cobble beds. The riparian vegetation (Alders, sedges, and other natives) is magnificent. The section will benefit from a scouring flood in the future. It is by no means perfect....yet.*

Tule Perch school: *Image of a school of Tule Perch which are common denizens in Phase 1 and Phase 2. Image shows the school of perch and a boulder array in Phase 2 that is mixed with large root wads. Clipped from video File 5086-22R18. Trout and other species are also common in this area.*

SECTION C: Claims that Phase 3 offers "....the unique opportunity for people to view animals living in their natural surroundings":

KEN DAVIS COMMENT:

My experience, extensive background and current endeavours certainly qualify me as an expert in the field of wildlife photojournalism, photography, and eco-tourism. The claims made within the **Springer Letter** are more authoritatively addressed by a photographer / biologist with my background. The Phase 3 Section definitely has a group of wildlife, aside from beavers with dens, that are probably transient non-residents. Viewing any wildlife from the walking path is difficult at best depending upon the time of day and the season. Showing sub-professional images of various animals does not make the site an ideal area for wildlife viewing. Without high-quality binoculars and /or a long-range telephoto lens, I find it difficult to believe that the average person will find the area a prime site for wildlife viewing. The well-constructed trail is a much different story. I too enjoy walking along the trail in the evening. See trail (view) image on Page 10.

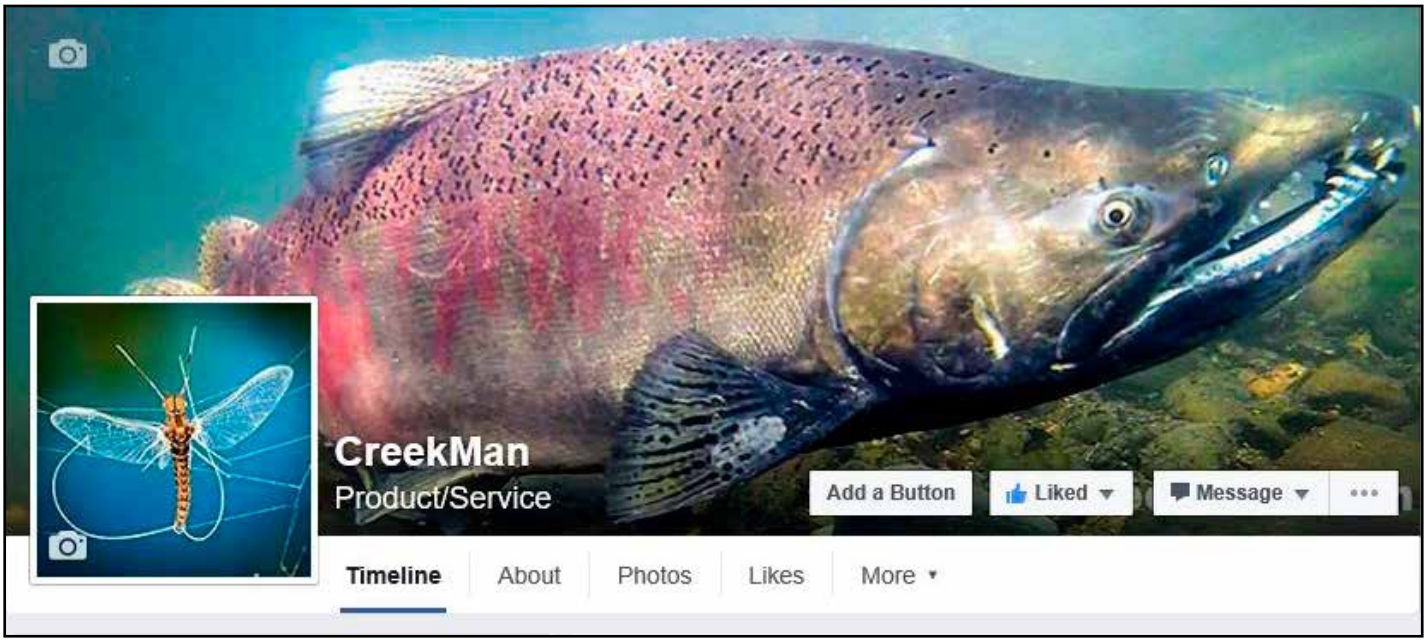
As a Wildlife Photojournalist, prior to the digital age, my images were published in more than 5000 different textbooks, calendars, posters and periodicals. That includes National Geographic Books, Zoobooks, Wildlife Conservation, Outdoor California, Encyclopedia Britannica, Sports Afield and American Angler. My images and video footage are routinely used by several universities (Including UCD), California Department Fish & Wildlife, several counties and the Federal Government Agencies. They have been on display at several institutions including the Harvard Museum of Natural History. Prior to the digital revolution my images were represented by an International Photo Agency. I continue to accept occasional photo assignments. On several occasions, I was contracted to determine if certain sites might be acceptable for the development of eco-tourism adventures, wildlife viewing, and photographic endeavors.

Western Blue Birds: *A female western bluebird is tempting a fledgling with a caterpillar she caught in the Nut Tree Mitigation Area. The return of migratory bluebirds to the riparian corridor of Putah Creek is a major success story. The project was accomplished by Melanie Truan with the Putah Creek Nest Box Highway. Ken Davis image taken 5/29/2016.*

Experience with Wildlife Photojournalism & Photography:

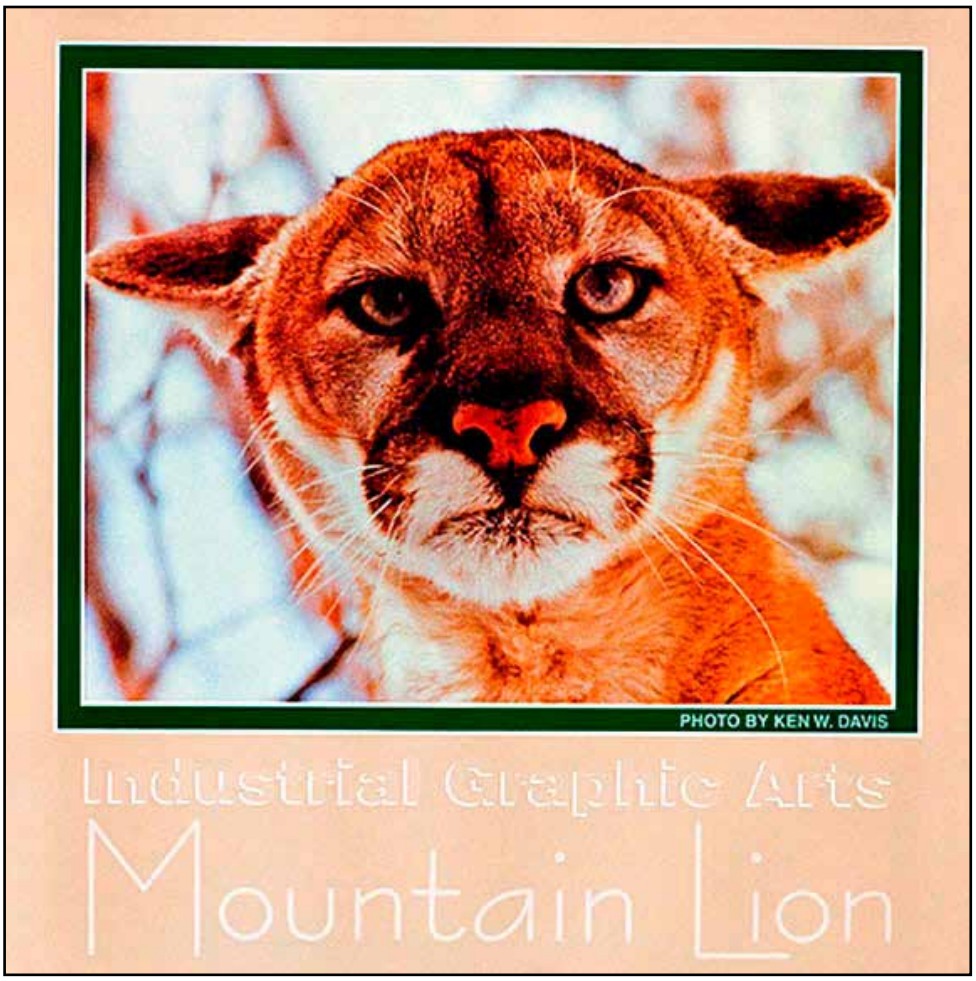
I was commissioned to find and photograph the aquatic invertebrate used for the cover image on the Spring 2006 edition of the **FlyFisher** and write the article ***"On the Bottom: Exploring the Lower Aquatic Food Web."*** The **FlyFisher** is the official magazine of the International Federation of Fly Fishers. The aquatic invertebrate is *Hesperoperla pacifica,* a golden stone fly collected from Indian Creek in Northern California. Over the last 15 years, it has been a common practice for me to write and photograph an occasional article for a selection of international periodicals. This demonstrates my ongoing and expanding expertise in the wildlife imagery and publishing arena.

Note: To demonstrate expertise with the aquatic food web and experience with the environmental industry, the article named above is embedded at the end of this letter.



FACEBOOK:

My Facebook Page (CreekMan) has 14,000+ followers that routinely see wildlife images from Putah Creek, including the salmon and mayfly on my banner page above.



Mountain Lion Poster Series: *This is just one of a series of my mountain lion images that were used is a series of posters. They are probably the most common lion images ever printed because the Graphic Arts Company that purchased them sent thousands of the posters to clients across the globe.*

The mountain lion is the same cat shown below in a tree near Alturas, CA.

Vernal Pool Poster*:*

Commissioned by the U.S. Fish & Wildlife Service, this vernal pool poster featured my environmental shots of the vernal pool complex at Mather Field in Sacramento. I have many years of experience studying vernal pools, photographing their indigenous species, and developing visitation as a part of educational programs.

Phase 3 Wildlife Observation Area: *The section of Phase 3 as viewed from the Northside Trail. This is the area claimed to be a unique opportunity for people to view animals. Photo 5/31/2016*

WILDLIFE VIEWING - THE FUTURE: I do believe that if Phase 3 Construction moves forward as planned that wildlife viewing areas can be developed. I have already suggested that a couple areas might be ideal for visitors to get close up views of salmon and potentially other wildlife. That potential depends upon funding, permits and protection of viewing areas. Unfortunately, I have worked on other projects where expensive viewing facilities and kiosks were developed only to be severely vandalized. The interest and energy of the residents represented by the **Springer Letter** can be instrumental to the development and protection of wildlife observation sites.

Ash-throated Flycatcher: *Image of an adult flycatcher with grasshopper to feed chicks. Image from Nut Tree Mitigation Area on May 31, 2016.*

Section D: Images from Winters Putah Creek Park and other Restoration Projects in Lower Putah Creek:

KEN DAVIS COMMENT:
Because much of the restoration work undertaken by the LPCCC and SCWA is completed in areas with limited access, the public generally does not have the opportunity to see the success. I am one of the few individuals that has been fortunate enough to follow and document, sometimes pro-bono, some of these restoration projects from initiation to the present. I have also been attempting to document as many of the wildlife species as possible including fish. Media projects are being undertaken to show the public the impressive results.

1. Dry Creek Alignment:
Undertaken in the fall of 2005, the project moved 1000 feet of creekbed away from Putah Creek road. It not only served to protect the road which was being undercut, it also realigned the creek into its original channel, improved wildlife habitat and salmon spawning areas. I was on site for much of the work and have monitored the area since its completion.

******* Note that I expect the results within the Winters Putah Creek Park Project to be very similar to the success of the Dry Creek Realignment Project. Of course, the public will have access to the WPCP section and I expect it to be more manicured with trails, creek access and multiple wildlife viewing opportunities.***

June 24, 2005 Image: Taken near Putah Creek Road. The road is behind the trees on the right side of the image. The aquatic invertebrate community was minimal in this area before realignment. The original channel was determined by a team that consisted of a hydromorphologist and several engineers. The creek was blocked, water diverted, and fish were rescued.

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Dry Creek Realignment Project: *Image taken on September 1, 2005 before the channel was watered. This is one of several hundred images taken to document various phases of the project.*

Dry Creek Realignment Project: *Image taken on September 30, 2005. The channel had been "watered." Staff from Putah Creek Council and volunteers stabilized the banks and planted numerous riparian plants. Image file # 1743-22AA*

Dry Creek Realignment Project: *Image taken on April 29, 2008. This is same site show in previous images. As expected, the creekbed changed during the high flows of 2006. Image File # 2754-22AA.*

Dry Creek Realignment Project: *Image taken on June 10, 2013. Same site as previous images. Image File # 4478-22AA.*

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Dry Creek Realignment Project: *Chinook salmon (2) above redd on November 25, 2015 at the confluence with Dry Creek. This site is exactly at the upstream end of the Dry Creek realignment project. Gravel from this site is ultimately expected to make its way by natural recruitment into the Winters Putah Creek Park area. These are just two of the approximately 40 salmon that spawned in the restored section. We also had several pair of trout that spawned in the same area in November 2015.*

Dry Creek Realignment Project: *Winter flows were almost ideal for spawning salmon December 14, 2015 at the confluence with Dry Creek. The salmon in this area were especially sensitive and did not respond well to observers.*

2: Weir Development:

Numerous weirs have been developed through the system. Although a couple of weirs are within the Winters Putah Creek Park Project, most are on private property. The weirs naturally develop plunge pools that are relished by a wide variety of fish. They tend to collect some woody material and naturally develop a highly complex habitat. I have documented trout, salmon, pond turtles, river otters and other species using the weir habitat.

Research Weir: *This is a "W" Weir. Boulders are placed in the shape of a "W". Salmon have spawned at this site for the last three years. I believe that the series of smaller restoration projects including the WPCP Project are partially responsible for the increase in the salmon runs in Putah Creek. Drone image.*

Research Weir: *Weirs support a variety of fish and develop a complex environment. This healthy rainbow trout dominated a weir that is about two miles downstream from Winters.*

2: Winters Putah Creek Park:

I sampled much of the WPCP for aquatic invertebrate for approximately eight years prior to the development of the project. In general, the invertebrate community was similar to what exists today in Phase 3. The entire stretch as characterized by wide, slow water conditions. The species diversity was low and primarily water boatmen, leeches, scuds, and some dragonflies.

Percolation Dam: *The Percolation Dam before removal. The structure was dangerous with fractured segments, had exposed rebar and served as a barrier to floating debris.*

Percolation Dam Site: Taken on November 8, 2009 after removal of the fractured Percolation Dam.

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NOTE: Sequential image PDF from this view (September 1, 2011 to date) is available on request.

Winters Putah Creek Park: Image taken from the Winters Bike Bridge on September 1, 2011. Note the wide shallow conditions with limited access from either bank. The invasive aquatic weed Myriophyllum sp. can be seen in shallow areas on both sides of the waterway.

Winters Putah Creek Park: Image taken from the Winters Bike Bridge on May 31, 2016. Note the people swimming and sunbathing in the middle of the creek. Use the power pole on upper right side of images for a site reference.

Winters Putah Creek Park Images:

I was on site for most of the construction process. It's impossible to show the voluminous amount of media in this document. The entire process will be available in the near future within a media project that is being developed.

Winters Putah Creek Park: Phase 1 Fish Rescue. 10/4/2011

Winters Putah Creek Park: Matches the site of fish rescue in image above. 5/13/2013. Use the bike bridge as a site reference.

Phase 1 - Neil Crossing: Comparative Images from the Neil Crossing.

Phase 1 - Neil Crossing and Weir: Image taken on December 12, 2011 after water was returned to the new channel.

Phase 1 - Neil Crossing and Weir: Image taken on May 17, 2016. Use arrows for site comparison and palm tree in top middle background.

Phase 1 - Neil Crossing and Weir: Pair of salmon that spawned in the Neil Crossing - 2015

Phase 1 - Neil Crossing and Weir: Chinook Fingerling - May 2016

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Benthic Scarification: The process of scarifying cemented sections of the creek has shown to benefit aquatic invertebrate communities, spawning trout and spawning salmon.

Scarification Site 5. December 10, 2014.

Spawning Salmon: One of the female salmon that chose to spawn in one of the Scarification Study areas. Note the open gravel created by the scarification process. 2014 Image © Ken W. Davis.

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CONCLUSION:

Study this Phase 1 image closely. It is one of many that I took of the trash, tires and other refuse removed from the WPCP Project. The arrow points to the tank of a Tar Truck that had to be removed beneath the old Winters Car Bridge (See current image of the site on Page 23). The car bridge was being undercut and the creekbed was deep mud. I watched a dedicated team remove a plethora of junk and begin the restoration of the Winters Putah Creek Park. Refuse was removed from all sections of the WPCP.

NOTE: I took the above image and an accompanying video on 9/29/2011. Three years later, in December 2014, Chinook salmon spawned in almost exactly the same spot where the men are standing on the pipes. During the 2015 Salmon run, the largest salmon in the run spawned in that very spot.

The New Winters Car Bridge: Similar view as construction image on page 21. In December 2015, several pair of Chinook salmon were documented spawning exactly under the new bridge (see arrow). Others spawned nearby. This is an ideal site for the public to safely view spawning salmon on public grounds. Image taken 6/2/2016.

Sincerely,

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Attachment:

1. Article: Davis, K. 2006. *On the Bottom: The Lower Aquatic Food Web*. The FlyFisher. 4 pp.

References:

Davis, Ken. 2006. *Report 2040C- Design Channel.* Report to the Putah Creek Streamkeeper. PDF. 5 pages.

McCafferty, Patrick W. 1998. *Aquatic Entomology: The Fisherman's and Ecologists' Illustrated Guide to Insects and Their Relatives."* Jones and Bartlett, Sudbury, Massachusetts. 447 pp.

Reice, Seth R., and Margaret Wohlenberg. 1993. *Monitoring Freshwater Benthic Macroinvertebrates and Benthic Processes: Measure for Assessment of Ecosystem Health*. **In Freshwater Biomonitoring and Benthic Macroinvertebrates.** eds, V.H. Resh and D.M. Rosenberg, pp. 287-305. Chapman and Hall, New York.