Project: Draft Environmental Impact Report Review, Walt Ranch, Napa County, California

TO Mr. Thomas N. Lippe
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329 Bryant Street, Suite 3D
San Francisco, California 94107

November 20, 2014

RE: **Review of Draft EIR, Walt Ranch Project, Napa, CA**

Dear Mr. Lippe,

I have reviewed the Walt Ranch Draft EIR (DEIR; dated July 1, 2014) and its supporting documents, and have reviewed the information provided and impacts identified in the DEIR, as well as the avoidance and mitigation measures proposed for foothill yellow-legged frog (*Rana boylii*), California red-legged frog (*Rana boylii*), and western pond turtle (*Emys marmorata*). My review and evaluation is based on my 20^{+} year career as a herpetologist working with these species as a biological consultant and also as an academic researcher with 25 peer-reviewed papers published in professional journals. My review and evaluation of this DEIR is based on my intimate knowledge regarding the ecology of the three species of concern and my expertise on California ecosystems, particularly wetlands and stream ecology.

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FOOTHILL YELLOW-LEGGED FROG

Foothill yellow-legged frog (FYLF) is the sole obligate stream-dwelling amphibian that is native to central California. Breeding typically occurs in backwater tributaries to main stream courses following snow melt and the end of the winter high-velocity water flows. FYLF breed in both perennial and intermittent tributaries. Egg masses are attached to the lee sides (down flow side) of cobbles within the channel bottoms. When hatched, larval FYLF seek shelter in cobble crevices and feed on algae on the rock and detrital surfaces. Juvenile and adult FYLF bask in open canopy areas of streams and creeks – typically on rocks, vegetation mats, or downed woody debris within the streams.

The primary concerns when evaluating for impacts to FYLF that can result from construction activities and landscape alteration are: 1) changes to water quality; 2) physical changes to stream/creek courses and flow rates and volumes from water deprivation through direct pumping and/or actions affecting the underground water table or other sources; 3) erosion and sedimentation into the aquatic ecosystems and subsequent entombment of cobble substrates; 4) potential for changes in canopy and streamside vegetation cover; 5) the potential for the introduction of non-native predators; and 6) the potential for introducing pesticides and herbicides into the aquatic ecosystems via wind drift during chemical application, consequent diffusion and leaching into soils, and via runoff during and after rain events. [Wind drifting of agricultural pesticides is well-documented in the literature, as is the presence of these chemicals within aquatic amphibians, and the effects of such chemicals on amphibian survival, growth, and development.]

CALIFORNIA RED-LEGGED FROG

California red-legged frog (CRLF) occurs in both pond and stream habitats. Breeding typically occurs from January to March in slow-moving, deep-water pockets of tributaries to main stream courses and in ponds. Egg masses are attached to vegetation within the water. When hatched, larval CRLF remain hidden in vegetation and often bury in the mud bottoms of pond. Like FYLF, CRLF larvae feed on algae coating detritus, rocks, and downed woody debris. Metamorphic, juvenile, and adult CRLF bask along the edges of ponds, streams, and creeks. Juvenile and adult CRLF forage into upland habitat for distances of up to 1,000 feet or more and disperse from one aquatic system to another typically following moist drainages, but can also disperse overland during humid conditions. CRLF is active year-round.

The primary concerns when evaluating for impacts to CRLF that can result from construction activities and landscape alteration are: 1) change to water quality; 2) physical changes to stream/creek courses and flow rates and volumes from water deprivation through direct pumping and actions affecting the underground water table or other water sources; 3) physical changes to the volume of pond water through a) direct pumping and actions affecting the underground water table or seeps feeding the pond, b) destruction or alterations to the course of water drainages flowing into the pond or c) breaking through the hard pan layer below the pond; 4) erosion and sedimentation into the ponds and subsequent loss of water depth; 5) alteration or destruction of upland habitat; 6) alteration or destruction of emergent vegetation

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in and around the pond; 7) the potential for the introduction of non-native predators; and 8) the potential for introducing pesticides and herbicides into the aquatic ecosystems via wind drift during chemical application, consequent diffusion and leaching into soils, and via runoff during and after rain events.

WESTERN POND TURTLE

Western pond turtle (WPT) is the only aquatic turtle native to central California, including Napa County. WPT inhabits many types of water bodies ranging from permanent to ephemeral and from freshwater to brackish habitats. WPT prefer habitats with low-velocity water flows that contain woody or rocky debris that provide emergent and underwater refugia. WPT habitat quality is dependent upon the availability of aerial and aquatic basking sites. WPT is an aquatic turtle that usually leaves aquatic habitat only to reproduce, aestivate, and/or overwinter. WPT may overwinter in terrestrial or aquatic habitat, or may remain active in water during the winter season. WPT activity noticeably increases when surface water temperatures consistently reach at least 15°C; therefore, WPT may be active year-round along the central and southern coast of California. WPT can often be observed thermoregulating on aquatic basking areas such as rocks, logs, or emergent vegetation mats in the water.

WPT are dietary generalists and locate food through sight and/or smell. WPT have a very keen sense of smell. Aquatic invertebrates are the mainstay of the adult diet, but carrion, small fish, frogs, and some vegetation are also consumed. The diet of young pond turtles is poorly understood, but they are thought to eat zooplankton.

Sexual maturity in WPT is size- and age-dependent, and in California reproductive maturity typically occurs when animals reach approximately 7 to 11 years of age. Females typically produce eggs on an annual basis and, at times, will double clutch. Suitable oviposition sites must have the proper hydric and thermal environment, as excessively moist nest areas have a high probability of failing, and warm temperatures are required for incubating eggs. Nests are typically dug on slopes in a substrate with a high clay or silt component, and are located on unshaded slopes to ensure that substrate temperatures will be high enough to incubate the eggs. Slopes generally range between 25° and 60°, with 25° slopes apparently preferred. Distance from aquatic habitat to a nest site is dependent on the appropriate features being present for nesting, and can therefore range up to 400 m, but the nest is generally located within 200 m of aquatic habitat. Most oviposition occurs during May and June, although some individuals may deposit eggs as early as late April, and as late as early August.

The primary concerns when evaluating for impacts to WPT that can result from construction activities and landscape alteration are: 1) water quality; 2) physical changes to stream/creek courses and flow rates and volumes from water deprivation through direct pumping and actions affecting the underground water table; 3) physical changes to the volume of pond water through a) direct pumping and actions affecting the underground water table or seeps feeding the pond and b) destruction or alterations to the course of water drainages flowing into the pond; 4) erosion and sedimentation into the ponds and subsequent loss of water depth; 5) alteration or destruction of upland habitat within 1,500 feet; 6) alteration or destruction of vegetation in and around the pond; 7) the potential for the introduction of non-native

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predators; and 8) the potential for introducing pesticides and herbicides into the aquatic ecosystems via wind drift during chemical application, consequent diffusion and leaching into soils, and via runoff during and after rain events.

CRLF Supporting Documents

The DEIR states: "*WRA conducted a habitat assessment and protocol level surveys in 2007 for CRLF (WRA, 2007); AES biologists conducted a CRLF habitat assessment in 2007 and protocol surveys in 2008 (AES, 2008) and an update to that report in 2012 (Appendix K; AES, 2012). All of these surveys included searches for other amphibian species, including FYLF, which is strictly aquatic and occurs in a subset of the habitat in which CRLF is found. Because Capell Creek supports CRLF habitat, CRLF presence was assumed on the Walt Ranch property within the entire Capell Creek watershed. Therefore, protocol-level CRLF surveys occurred within the Milliken Reservoir watershed, on the southeastern portion of the Walt Ranch property. In 2007, CRLF surveys of the survey area were conducted by WRA (2007) with negative results (WRA, 2007a and 2007b). In 2008, breeding and non-breeding season, protocol-level surveys were conducted by AES, with negative results (AES, 2008). In 2012, non-breeding surveys were conducted by AES, with negative results (Appendix K; AES, 2012). Survey results were negative for CRLF in 2007, 2008, and 2012*."

From Appendix M (Page 8): "*Within the Project Area, aquatic habitats (creeks and ponds) and the surrounding vegetation or riparian areas were identified as being high-value and most likely to support special status species. Wildlife biologists therefore surveyed all aquatic features at least once, and made repeated visits to especially suitable habitats such as ponds and deep pools along creeks. These areas were initially deemed especially likely to support populations of special status frogs and turtles…During the course of 2007 surveys at Walt Ranch, WRA biologists were able to assemble enough information about the Project Area to draw strong conclusions about the presence or likelihood of special status species*."

Comment: No data are presented to explain why CRLF is not presumed present in Milliken Reservoir Watershed. According to the Biological Assessment (BA) in Appendix M "a*quatic habitats (creeks and ponds) and the surrounding vegetation or riparian areas were identified as being high-value and most likely to support special status species."* Appendix M also states that "*Protocol-level surveys were performed for the federal threatened California red-legged frog (Rana aurora draytonii), requiring multiple day and night surveys during the spring and summer in ponds and deep pools spread across the Project Area*." No details of the surveys are reported in the BA, nor are the results of the surveys provided. In fact, there is no further discussion or mention of CRLF in the 50^{+}-page BA beyond page 8 with the exception of Appendix B in the BA wherein CLRF is listed as "unlikely" to occur (Page B-8) – one presumes that the BA concludes that CRLF is unlikely to occur anywhere on the project site, despite the earlier assertion that CLRF is presumed present in the Capell Creek Watershed.

The potential for species to occur in Appendix B of the BA is categorized as either Present or with a High, Moderate, Unlikely or No Potential to Occur. According to the BA (Page 7) Unlikely to Occur is defined as "*Few of the habitat components meeting the species requirements are*

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present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site." This assessment of Unlikely to Occur relative to CRLF is not accurate even by their own reporting. Section 3.2.4 (Page 8) of the BA states: "*Many special status wildlife species range over large areas, may be present only during certain seasons, and may be difficult to spot even if they happen to be present. Therefore, wildlife assessments must often be based upon the suitability of habitat and other factors rather than actual observations of the species. Due to the large area and difficult terrain, wildlife surveys were focused on high-value habitat areas*." All aquatic habitats were assessed as being of high value, and despite the lack of data on survey results for CRLF - even if CRLF were never observed - the presence of high-quality habitat would necessarily lead to designating the species as having a High Potential to Occur across the entire project site and the need to assume presence of the species in all aquatic habitats, including Milliken Reservoir Watershed.

Per Hayes and Jennings (1988) habitat correlates for CLRF include intermittent, low order streams with intact emergent or shoreline vegetation that included willows, specifically Arroyo will. The BA describes riparian vegetation (Page 16): "*Milliken Creek is an example of a large (10-20 foot wide bed) intermittent stream with a well-developed assemblage of uniquely riparian species. Commonly observed canopy species in this drainage include Oregon ash (Fraxinus latifolia), Fremont's cottonwood (Populus fremontii), and arroyo willow (Salix lasiolepis)*." Thus, based on the BA, all aquatic habitat – including Milliken Reservoir Watershed with its multiple tributaries - is suitable breeding, foraging, and/or dispersal habitat for CRLF.

PROTOCOL SURVEYS

CRLF Survey Protocol Requirements

The most current protocol survey guidelines for CRLF were published by the United States Fish and Wildlife (USFWS) in 2005. Surveys can begin anytime during January and should be completed by the end of September; however, for the Napa County, breeding season surveys are recommended from January through February 28 as this is prime breeding season for CRLF in that area. To meet protocol, eight survey visits are required to be conducted throughout the survey-year (January through September). Two daytime surveys and four nighttime surveys are recommended during the breeding season; one day and one night survey is recommended during the non-breeding season. Each survey must take place at least seven days apart. At least one survey must be conducted prior to August 15th.The time between the first and last survey must be at least 6 weeks. Throughout the species' range, the non-breeding season is defined as between July 1 and September 30.

DEIR - CRLF Protocol Surveys

Per the DEIR (Page 4.2-3), protocol CRLF surveys were conducted in 2007 and 2008; however, no information is provided to identify the areas that were the subject of those surveys – (Milliken Reservoir Watershed only?). The only supporting documentation provided is Appendix K (surveys conducted in 2012) and Appendix M (surveys conducted in 2007). Page 4.2-3 of the DEIR states that eight surveys were conducted between May and July of 2007; however, this does not meet protocol as no surveys were conducted in January or February which is the

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prime breeding season in Napa County. Further, the information does not identify which areas were surveyed and it is unlikely that suitable habitat across the entire 2,300 acres site could be surveyed in a single site visit. It is not possible with the limited information given on Page 4.2-3 to ascertain whether protocol requirements were met in 2008. Further, since CRLF were presumed present in the Capell Creek Watershed the DEIR does not provide information as to why protocol surveys were deemed necessary.

Appendix K – 2012 California red-legged Frog Survey Report

Appendix K reports two surveys conducted on August 6 (day) and August 20 (night), 2012. This document reports negative findings during these non-protocol surveys which are of little value; however, three concerns are raised by this report:

1) Per Appendix K (Page 11): "Surveys consisted of both audio and visual assessments of the aquatic features within the survey area. Upon initially approaching each feature, a few minutes of silence were taken to listen for CRLF calls. Surveyors then observed each site from the banks looking for egg masses, larvae, metamorphs, juveniles, adults and any other information (e.g., predatory evidence).

   Comment*: CRLF do not call outside the breeding season and do not breed in August* (Storer 1925; Padgett-Flohr and Jennings 2002; Cook and Jennings 2007; California Herps2014).

2) Per Appendix K (Page 12): "A tadpole/subadult frog was also observed in Pool 2 during the day survey, but at the time biologists were unable to identify the species."

   Comment*: This statement makes no logical sense. A tadpole (larva) is a completely different life stage from a subadult and those two lifestages are completely different as illustrated below. Larvae (tadpoles) have large finned tails and are completely aquatic, whereas subadults have no tail and are both aquatic and terrestrial. Biologists qualified for working with CRLF must be able to accurately identify all amphibian life stages and specifically all life stages of CRLF. Herpetologists working with amphibians in central California must be able to identify tadpoles by species regardless of how small the animal is. Further, experienced herpetologists can differentiate between a tadpole and a subadult.*


Photograph 1: CRLF larva


Photograph 2: CRLF Metamorph

3) Per Appendix K (Page 12): "The night survey was conducted two weeks later, at Pools 2 and 3. Due to rough terrain, Pool 4 was unable to be safely accessed at night and thus

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was not surveyed. Biologists located the metamorph/subadult frog in Pool 2 and determined the frog was a bullfrog since the overall length was between four and six inches, which is too large for a CRLF at that stage of development. CRLF tadpoles are up to three inches in length, whereas bullfrog tadpoles may be up to 6.5 inches.

> **Comment***: Size is not a diagnostic when identifying amphibians to species. The key diagnostic trait for the terrestrial life stage (i.e., metamorphic young-of-the-year through adult) is the presence of a dorso-lateral fold that runs complete and intact from eye to groin in CRLF. Bullfrogs lack this feature. In addition, the tympanum (ear membrane) in bullfrogs is approximately 2-3 times the size of the eye; whereas in CRLF the tympanum is approximately the same size as the eye. A metamorphic bullfrog – or any frog or toad species - is not four to six inches at metamorphosis, they are typically closer to 1.5 to 2 inches in size. Subadult bullfrogs and CRLF can be four inches in size. Adult CRLF and bullfrogs can be near six inches. Further, unless this animal was captured by hand, the size is not possible to determine from a distance. (Storer 1925; Jennings and Hayes 1994). For CRLF larvae, the key diagnostic is the presence of a lateral line pattern on the body that is iridescent gold. In addition, for very small larvae, toothrow formulae are used to identify to species. Size is never a factor in species identification of anuran larvae.*

Summary of Appendix K

Appendix K reports on only two non-protocol surveys conducted in August 2012. The primary concern based on the information detailed in the report - and discussed above - is that the biologists conducting the surveys were clearly not qualified or experienced enough to adequately conduct the surveys for this threatened species, to identify either the amphibian species or the lifestages they observed, nor to provide defensible results and conclusions. In addition, the time reported on the data sheets (between noon and 2pm) when surveys were conducted during the day was the time of day when herpetologists are least likely to detect adult CLRF (Hayes and Tennant 1985; Fellers and Kleeman 2006). Further, surveys typically require a minimum of four hours of observation (Padgett-Flohr and Jennings 2002), not the less than two hours reported. Typical day surveys conducted by highly experienced herpetologists occur early in the morning when the sun is out. In addition, the species description information was apparently copied from a website (CaliforniaHerps.com), as opposed to a review of peer-reviewed research on the species and is inaccurate in a number of places (Pages 5 and 6 of Appendix K) as discussed below:

Comments*:*

1. “They [CRLF] have a dark strip extending from the shoulder to the upper mandible and their hind legs are red underneath”.

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I have never observed this stripe after handling over 10,000 CRLF and not all CRLF have hind legs with red coloration (Storer 1925; Jennings and Hayes 1994).

2. "CRLF occur at elevations from sea level to 5,000 feet."
   The species occurs up to 6,500 feet in elevation (Storer 1925; MR Jennings and MP Hayes pers com.)

3. During the non-breeding season, CRLF aestivate.
   CRLF do NOT aestivate. *CRLF are active year-round*. (Bulger et al 2003, Fellers and Kleeman 2007; Tatarian 2008)

Appendix M

Appendix M (Pages 8-9) states: "Protocol-level surveys were performed for the federal threatened California red-legged frog (*Rana aurora draytonii*), requiring multiple day and night surveys during the spring and summer in ponds and deep pools spread across the Project Area. For detailed information about the methods and results of these surveys, see the Draft California Red-legged Frog Survey Report, Walt Ranch (WRA 2007b)."

Pages 4 and 5 identify surveys dates and areas: May 7 (Milliken Reservoir Watershed), 8 (Capell Creek Watershed), 14 (Milliken Reservoir Watershed), 15 (Various), 24 (Capell Creek Watershed), 31 (Capell Creek Watershed), June4 (Capell Creek Watershed) July 24 (Capell Creek Watershed), 25 (Capell Creek Watershed).

Comment: *The referenced Draft report (WRA 2007b) is not provided in the DEIR nor its appendices. The species name is incorrectly identified. CRLF is a full species – Rana draytonii - not a subspecies (Shaffer et al 2004; Conlon et al 2006). Further, given the dates provided, protocol was not met as the surveys were not conducted during the prime breeding season (January to February), and the required eight surveys were not conducted in either Watershed.*

Summary of Appendix M

The Biological Assessment (Appendix M of the DEIR) does not include any further information regarding the protocol surveys (i.e., methods, results, conclusions or specific personnel conducting the surveys) conducted in 2007. In Appendix B of Appendix M (the Biological Assessment) a table is provided with an assessment of the potential for target species to occur in the project area (Walt Ranch). CRLF is assessed as being unlikely to occur in the project area (Page B-8) based on survey data; however, it is clear from the data provided that protocol surveys were not conducted that would meet the standards of the regulatory agencies. In addition, the DEIR had already stated that CRLF presence is presumed for the Capell Creek Watershed as discussed above in "CRLF - Supporting Documents"; therefore, this designation in the table is not justified.

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SUMMARY REVIEW OF PROTOCOL CALIFORNIA RED-LEGGED FROG SURVEYS

Based on the information provided, it is clear that thorough, complete surveys for CRLF were not conducted on the Walt Ranch property. Surveys for which information was provided do not meet the standards for USFWS protocols. It is also clear that survey personnel in at least 2012 were not competent to conduct the surveys.

Per the DEIR (Page 4.2-37): "*no evidence of CRLF has been found on the property (AES, 2008; 2012; WRA, 2007b). Nonetheless, CRLF presence is assumed on the Capell Creek watershed portion of the property because it is within the potential dispersal distance of adult frogs.*"

Given that protocol surveys were not properly conducted by qualified personnel, this first statement is not supported by the data provided. In addition, if CRLF is present in Capell Creek Watershed, CRLF are capable of traversing the project site, particularly during the wet season and reaching the Milliken Reservoir Watershed. It seems very likely based on the information of habitat quality, that CRLF would be present in Milliken Reservoir Watershed, and, in fact, may be present in any aquatic habitat on the project site.

REVIEW OF DEIR IDENTIFIED IMPACTS AND AVOIDANCE AND MINIMIZATION MEASURES

Impact 4.5-3: Some hazardous materials releases could occur from wind drift of sprayed chemicals (pesticides, fertilizers, or herbicides). Wind drift is the movement of airborne spray droplets, vapors, or dust particles away from a target area (Cordell and Baker 1998). With implementation of Napa County PBES BMPs, Proposed Project IPM strategies, and SOPs as described in Mitigation Measure 4.5-1, Mitigation Measure 4.5-2, and Mitigation Measure 4.5-4, including wind drift reduction measures, it is not likely that significant impacts to soil, watercourses, or groundwater would occur from agricultural chemical application as a result of the Proposed Project. Appropriate methods for mixing and cleanup of herbicides and pesticides are provided below under Mitigation Measure 4.5-3. Impacts after mitigation would be less than significant.

THE DEIR states (Page 4.5-2) that: "Agricultural chemicals and chemical pesticides could potentially be used as needed throughout the project site. The specific type of chemical to be used onsite would be determined as it is needed."

Comment: None of the mitigation measures address airborne drift of pesticides or herbicides to prevent introduction of the chemicals into streams and drainages. All mitigation measures address: 1) hazardous materials associated with construction equipment during construction of the project and 2) hazardous materials leak or spill prevention (generally fuels). Mitigation Measure 4.5-1 pertains to developing a Hazardous Materials Business Plan that documents all hazardous materials. Mitigation Measure 4.5-2 addresses developing Standard Operating Procedures (SOPs) for hazardous materials associated with construction and construction equipment. Mitigation Measure 4.5-4 deals with purchasing and storing pesticides. There is no mitigation measure that directly addresses the application of the pesticides/herbicides nor reducing wind drift of pesticides or herbicides during and after application. Impacts to FYLF, CRLF, and WPT due to the annual application of chemicals that drift into the aquatic systems

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are not addressed. Effects of these chemicals on amphibian populations have been widely researched and documented (Willingham and Crewes 1999; Fellers et al 2004; Davidson 2004; Davidson and Knapp 2007; Bradford et al 2010; Dimitrie and Sparling 2014). Further, on October 20, 2006, the U.S. District Court for the Northern District of California imposed no-use buffer zones around California red-legged frog upland and aquatic habitats for certain pesticides. Under the injunction and order, no-use buffer zones of 60 feet for ground applications and 200 feet for aerial applications apply from the edge of the following California red-legged frog habitats as defined by the USFWS and the Center for Biological Diversity: Aquatic Feature, Aquatic Breeding Habitat, Non- Breeding Aquatic Habitat, and Upland Habitat.

Impact 4.2-4 (Page 4.2-91)*: "Development of the Proposed Project could result in impacts to wetlands or waters of the U.S., which would be inconsistent with Policies CON-26, CON-30, and CON- 42. This would also conflict with Napa County Code Section 18.108.025 (General provisions – Intermittent/perennial streams). However, after mitigation, impacts would be reduced to less-than-significant levels. There are two sensitive locations, one in Block 5A3 and the other in Block 8 that should receive additional protection beyond that proposed in the ECP. This is discussed in Mitigation Measure 4.2-4 below. With the incorporation of the mitigation measures listed below and standard BMPs, direct impacts to wetlands and waters of the U.S. would be considered less than significant."*

Mitigation Measure 4.2-4 (Page 4.2-93): The DEIR states that a Section 404 permit will be obtained and a Streambed Alteration Agreement will be obtained - if needed - prior to construction activities that impact riparian zones. DEIR further states that unavoidable impacts to Waters of the U.S. will be mitigated for by creating or restoring Waters of the U.S. onsite.

"To avoid indirect impacts to all other wetlands, avoidance buffers of 50 feet shall be established around each of the wetlands, which include a 24-foot vegetated turnaround avenue and a 26-foot undisturbed filter strip. Temporary orange construction fencing, or other method acceptable to Napa County, shall be installed around all wetlands and any drainage features in the vicinity of and outside of the construction area. Fencing shall be located a minimum of 26 feet from the edges of wetlands as identified by a qualified biologist. All fencing shall be installed prior to the commencement of any earthmoving activities and shall be field verified by Napa County. The fencing shall remain in place until all construction activities in the vicinity have been completed. Vineyard development near streams that meet the Napa County definition of a stream will maintain setbacks in compliance with the Napa County Conservation Regulations and Code 18.108.025 (see Table 4.2-7). For drainages which do not meet the Napa County definition of a stream, 20-foot minimum setbacks are maintained from the top of bank. Minimum 50- foot setbacks (which includes a 24-foot vegetated turnaround avenue and a 26-foot undisturbed filter strip) are maintained around all wetlands. Using BMPs as proposed by the project, such as cover crop management and integrated pest management, in addition to the proposed setbacks, would effectively filter sediments, agricultural chemicals, and nutrients to a less-than-significant level."

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Comments:

1. A 50-buffer is to be established around all wetlands, yet the third sentence says that fencing shall be located a minimum of 26 feet from the edges of the wetland. Typical buffer zones around wetlands are at least 100 feet from Mean High Water Mark or top-of-bank (Swales 2010; CDFW 2014).
2. The DEIR says that 20-foot minimum setbacks will be maintained from drainages that do not meet the definition of a stream per Napa County; however, these are the drainages that FYLF would use for breeding and nursery habitat, and that WPT and CRLF would use for foraging and dispersal. These 20-foot minimum setbacks are insufficient to protect these species and the aquatic resources from. Changes to the topography and vegetation would result in impacts to the aquatic habitat (see the review by expert hydrologist, Greg Kammen) that would in turn result in impacts to the FYLF, CRLF, and WPT. Typical buffer zones for wetlands as set by California Department of Fish and Wildlife (CDFW) are 250 feet (CDFW 2014). For other states, buffer zones can vary, but typically require large buffers of greater than 100 feet for wetland habitat of high value and can range as high as 275 feet (McElfish et al. 2008).
3. BMPs are not appropriately identified and details of the BMPs are not provided; therefore these impacts have not been reduced to less-than-significant and further do not address the impacts to FYLF, WPT or CRLF.
4. Temporary orange construction fencing will not reduce soil erosion nor confine soils to the construction areas.
5. Creating or restoring wetlands to mitigate for impacts to Waters of the US, does not mitigate for impacts to special-status species (i.e., WPT, CRLF, and FYLF) that may occur within those habitats.

Impact 4.2-4 (Page 4.2-92)*: "Activities associated with roads and stream crossings would result in direct impacts to waters of the U.S. and will require permits from the USACE and CDFW. Figure 3-11 illustrates the network of roads and stream crossings*." According to Table 4.2-6 (Page 4.2-93), there are 23 areas where Water of the US will be impacted due to road improvements and construction. Currently the "*majority of the stream crossings on these roads are ford crossings*" (Page 3-24). As listed on Page 3-28: "*The 21 crossings listed in Table 3-4 (Proposed Stream Crossing Improvements) are proposed to be upgraded to rocked water crossings under the Proposed Project, as detailed in the ECP (Appendix A)*."

Comments:

1. The proposed stream crossing improvements are not specified and upon reading the text, the reader assumes that the intention is to install rocked water crossings at all of these 21 locations. As FYLF attach their eggs to the lee sides of cobbles and rocks, this could be a potentially significant impact as vehicles crossing the rock structures can crush eggs or larvae that secrete themselves in the interstices of rock piles.
2. CRLF, FYLF, and WPT all bask in the sun on rocks, woody debris, and downed vegetation, as well as along the shorelines of aquatic habitat (Storer 1925; Jennings and Hayes 1994; Rathbun et al . 1992) These rock crossings will be likely basking spots for all three

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species. Impacts to the three species as a result of direct mortality from vehicles is not articulated nor addressed in the DEIR.

3. The ongoing maintenance of these rock crossings is not identified nor addressed. During high velocity flows following winter rains, these rock crossings typically degrade and must be maintained and re-built often on an annual basis. The activities associated with annual maintenance of the rock crossings are not identified nor is the timing of these activities mentioned in the DEIR. FYLF lay their eggs following winter rains and larvae upon hatching, hide in the interstitial spaces of the rocks. Maintenance at that tile would significantly impact FYLF using the rocks in and around the stream crossings.

Impact 4.2-10 (Page 4.2-114): "*Impacts to western pond turtle would be reduced to a less-than-significant level through a combination of avoidance and preservation of prime nesting and upland habitat. This is accomplished in through the stream setbacks provided in the project design and in Mitigation Measure 4.2-4, as well as the additional avoidance measures discussed below. Avoidance and Preservation In order to maintain sufficient nesting habitat for western pond turtle populations on the Walt Ranch property, approximately 4.07 acres of nesting habitat shall be avoided in Blocks 18A1, 18A2, 18A3, 18A5, 19B, 21B, 42, 45A, 45B, and 69, as well as in the vineyard avenues surrounding those blocks. These avoidance locations shall occur at the locations shown on Figure 4.2-10. This avoidance, in combination with other nesting habitat outside of clearing limits, will result in the preservation of approximately 20.27 acres (97.93 percent) of the western pond turtle nesting habitat on the property."*

Comments:

1. According to this impact statement, they are preserving 97.93 percent of nesting habitat for WPT; however, (Page 4.2-115) states:" *Approximately 4.5 acres of nesting habitat (or 21.7 percent) are located within portions of proposed vineyard Blocks 18, 19, 20, 21, 42, 45, and 69 and would be lost as a result of the project as currently proposed*."

   These acreages and percentages do not add up.
2. Please see #2 in Additional Considerations for further comments relative to WPT.

Mitigation Measure 4.2-10 (Page 4.2-114)**:** "*Prior to the approval of #P11-00205-ECPA, the plan shall be modified to include the following (any associated project features that become unnecessary as a result of the avoidance, such as proposed roads, shall also be reflected in the revised plan): Impacts to western pond turtle would be reduced to a less-than-significant level through a combination of avoidance and preservation of prime nesting and upland habitat. This is accomplished in through the stream setbacks provided in the project design and in Mitigation Measure 4.2-4.*"

Comments:

1. This is not a mitigation measure.
2. Comments on Mitigation Measure 4.2-4 were provided above.

Impact 4.2-11: "*Development and operation of the Proposed Project would have the potential to affect special status amphibian species, including two species of frogs in the region, California*

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red-legged frog (CRLF) and foothill yellow-legged frog (FYLF). This is a potentially significant impact. However, after implementation of mitigation measures to protect other aquatic resources and animals, impacts will be less than significant.

Amphibian declines have been attributed to several factors, including chemical runoff (particularly fertilizers and pesticides) into the aquatic environment, exotic bullfrogs, and overall habitat degradation. Impacts related to the construction and operation of this project could result in chemical runoff and habitat degradation. As discussed in Impact 4.2-4, vineyard development, including construction, upgrade, and use of roads near streams that meet the Napa County definition of a stream will maintain a minimum of 55 foot setbacks, in compliance with the Napa County Conservation Regulations and Code 18.108.025. For drainages which do not meet the Napa County definition of a stream, 20-foot minimum setbacks are maintained. Using BMPs as proposed by the project, such as cover crop management and integrated pest management, in addition to the proposed setbacks, would effectively filter sediments, agricultural chemicals, and nutrients to a less-than-significant level (recommended buffer widths are discussed in Impact 4.2-4)."

Mitigation Measure 4.2-11 (page 4.2-118): Refers back to Mitigation Measure 4.2-4 (above) and Mitigation Measure 4.2-10. Mitigation Measure 4.2-10 is specific to western pond turtle (*Emys marmorata*) and provides no mitigation for or avoidance of impacts to FYLF or CLRF.

Comment*:*

1. The DEIR says that 20-foot minimum setbacks will be maintained from drainages that do not meet the definition of a stream per Napa County; however, these are the drainages that FYLF would use for breeding and nursery habitat. These setbacks are insufficient to protect the species and the aquatic resources. Changes to the topography and vegetation would result in impacts to the aquatic habitat (see the review by expert hydrologist, Greg Kammen) that would in turn result in impacts to the FYLF, CRLF, and WPT. Typical buffer zones for wetlands as set by California Department of Fish and Wildlife (CDFW) are 250 feet (CDFW 2014). For other states buffer zones can vary, but typically require large buffers of greater than 100 feet for wetland habitat of high value and can range as high as 275 feet (McElfish et al. 2008).These setbacks are inadequate to protect WPT and CRLF that forage in the upland habitat. WPT can nest and/or aestivate within 1,300 feet of streams and ponds (Storer 1925; Rathbun et al. 1992; Jennings and Hayes 1994).
2. For amphibians, demonstrable effects of increased land-use intensity out to 3000 m for species richness and out to 4000 m for some individual species were found (Houlahan and Findley 2003). This means that the concept of "buffer zones" as a management technique for protecting amphibians would need to be quite large. Current Ontario policy states that "it is known that developments within 120 meters of wetlands have a reasonable probability of affecting the ecological functions of the wetlands which they surround" (Houlahan and Findley 2003).

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ADDITIONAL CONSIDERATIONS

> Per the DEIR (Page 4.2-119): "*Other than the small stretches of stream that would be modified for stream crossings, which is mitigated in Mitigation Measure 4.2-4, the Proposed Project would not modify the physical conditions of any streams or virtually any wetlands on the project site. The Proposed Project includes the maintenance of stream and wetland setbacks (thereby directly protecting habitat and indirectly protecting habitat through added sediment filtration benefits), the restriction of earthmoving activities to the dry season (April 1 through September 1 or October 1), and the installation of straw wattles, seeding and mulching of disturbed areas, and other erosion control measures and BMPs as discussed in Section 3.0 (thereby indirectly protecting habitat). The full compliance with the ECP will ensure that the Proposed Project would not significantly increase runoff or degrade water quality (discussed in Section 4.6 Hydrology and Water Quality) and would not significantly increase soil erosion or sedimentation (discussed in Section 4.4 Geology and Soils). This overall protection of the stream courses and wetlands onsite by avoidance and buffers will provide significant protection for the habitats of the two special status amphibians that may occur onsite*."

Comment*:* This statement has not been supported by the data provided. Unidentified cover crops and straw wattles would not prevent erosion on the steep slopes within the project area nor have the changes in water budget been mentioned as a result of the conversion of approximately 500 acres of essentially oak woodland forest to cover crops been discussed. Studies have shown that total runoff increases with a conversion from forest to cover crop (Twine et al 2004). Conversion from grasslands to cover crop may decrease total runoff in the absence of irrigation and other human influences on the water budget. Even more important than annual changes may be the seasonal changes in water balance that are crop dependent. Much of the recharge to aquifers depends on snowmelt, so any changes in spring total runoff rates may be especially important to water resources (Twine et al 2004).

There are three (not two) special-status species that could occur within aquatic habitat: CRLF, FYLF, and WPT. Sedimentation and siltation of streams and drainages would have significant impacts to FYLF, CRLF, and WPT. Further, the effect of obtaining underground water for retention in basins as not been taken into consideration; drawing from underground water sources has a high potential to alter the flow rates and volumes of water that fill the streams and ponds and thus alter stream courses, water volumes, and hydroperiods for in all aquatic habitats. Changes in stream courses, water volumes, and hydroperiods would have significant impacts to FYLF, CRLF, and WPT. Amphibian breeding requires very specific conditions. For example, FYLF breeds in back water tributaries following high volume water flows at the end of the rainy season. Alterations in hydrology due to siltation or changes in stream courses may result in filling of these tributaries and leading to unsuitable conditions for FYLF breeding. Alternatively, drawing from underground water tables may have severe consequences on stream water volumes resulting in formerly perennial streams becoming ephemeral and unable to support either WPT, CRLF, or FYLF.

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CRLF requires deep plunge pools in perennial streams and will also use lower-velocity streams. Changes in hydrology could therefore significantly impact CRLF.

> From the DEIR (Page 4.2-115): "*Based on turtle observations and habitat on the project site, it is estimated that approximately 531 acres of western pond turtle habitat occur on the 2,300-acre project site (Figure 4.2-3). This is composed of approximately 20.7 acres of prime nesting habitat and approximately 509.8 acres of upland habitat. Approximately 4.5 acres of nesting habitat (or 21.7 percent) are located within portions of proposed vineyard Blocks 18, 19, 20, 21, 42, 45, and 69 and would be lost as a result of the project as currently proposed. Approximately 40.1 acres of upland habitat (or 7.8 percent) are located within portions of proposed vineyard blocks throughout the property. A total of 44.6 acres (8.4 percent) of upland and nest habitat for western pond turtle is contained within the proposed vineyard blocks. Therefore, 91.6 percent of western pond turtle habitat would be retained within the site*."

Comment*:* There is no methodology given to indicate how these acreages were calculated and what criteria were used in determining WPT nesting and upland habitat. Virtually every aquatic system on the property would be expected to be occupied by WPT and lands within 1,300 feet of each aquatic system would be potentially used for nesting and/or aestivation, particularly west or south-facing slopes or areas with little canopy cover. Therefore, the acreages listed grossly underestimate the acreage of turtle habitat present and also grossly underestimate the acreage of WPT habitat that will be lost due to vineyard conversion.

In addition, combining the acreages to give a total of 8.4 percent of WPT turtle habitat lost is disingenuous and misleading. Based on the information reported, a loss of 21.7 percent of nesting habitat is a significant, unmitigable loss.

The installation of retention basins has a high potential to facilitate the introduction and dispersal of non-native predators, such as introduced fishes and bullfrogs. Bullfrogs are already present on the property and within Milliken Reservoir; thus, there is a high potential that bullfrogs could be introduced into the Capell Creek Watershed and significantly impact FYLF, FRLF, and western pond turtle as bullfrogs prey on all three special-status species. Further, many property owners purposely stock artificial waterbodies with non-native fishes for a variety of reasons. The impacts of facilitating or introducing non-native predators is not discussed in the DEIR nor are measures proposed for bullfrog control and eradication of non-native fishes.

CUMULATIVE IMPACTS

Section 6.1.3 (page 6.4): "*Over the past 19 years, approximately 974.4 acres of vineyard development were submitted for ECP approval, creating an average of 51.3 acres of vineyard development per year*."

Comment: The DEIR's numbers relative to cumulative impacts do not refer to Napa County. They refer to the "cumulative environment" - which is the much smaller area depicted in Figure 6-3 (Page 6.5) as determined by the project proponent. This analysis of "cumulative impacts" for a subsection of Napa County is disingenuous and misleading. Napa County, centrally located

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within the California Floristic Province, is a biological hotspot for multiple taxonomic groups. It is considered one of the more diverse sub-regions found within the California Floristic Province hotspot (Crain et al 2011). Napa County is one of the smallest counties in California at just over 200,000 hectares (494,210 acres). As of 2000 there were 284 wineries in Napa County; four years later 93 new wineries had been established converting 3,076 (7,600 acres) forested hectares to vineyards (MKF Research 2005). By 2006, 20,095 hectares (49,655 acres) of vineyards existed within Napa County representing 9.8 percent of the county's total land area.

Based on the literature, the average numbers of acres of vineyard development in Napa County is 769 acres per year, a far larger percentage than would be inferred by the 51.3 acres per year reported in the DEIR relative to the "cumulative environment".

Section 6.1.4-2(**Page 6-21**): "T*he Proposed Project will not have a significant cumulative effect on biological resources and will not have an incremental impact that will be considerable within the cumulative environment. Since the special status habitats and species addressed in these mitigation measures will reduce the impacts from the Proposed Project to less than significant, and since each of the other projects in the cumulative environment is held to the same CEQA standards, especially those under the jurisdiction of Napa County, there will be no significant cumulative impacts to the sensitive species and habitats analyzed in this Draft EIR*.

"*Although vineyards only provide limited habitat value for wildlife, local regulations ensure that installation of vineyards does not necessarily represent a total loss of habitat for wildlife*."

"*areas of particular habitat value to Western pond turtle and California red-legged frog have been removed from the Proposed Project and protected with buffers. There are no potential impacts to these species as a result of the pending Appropriative Water Rights applications, as the creation of the reservoirs would actually benefit western pond turtle and other amphibian species*."

Comment:

Walt Ranch lies within one of five areas (Region 2) identified as core species-rich regions that are being highly fragmented by vineyard expansion (Link 2012) as shown in Figure 1. Region 2 has four creeks and five designated linkages as potential wildlife corridors. Studies show that agriculture activities, specifically those associated with vineyard development, account for a 42% habitat loss within Napa County as of 2011 (Link 2012).

This DEIR does not adequately identify nor address impacts to WPT, FYL, or CRLF. Adjacent land uses have a significant impact on amphibian species richness, abundance, and community composition, with "*the size and quality of adjacent habitat being at least as important as, if not more important than, the size and quality of the breeding habitat. Incompatible adjacent land uses can affect amphibian species richness and community composition out to 3000-4000 m from the wetland edge*" (Houlahan and Findley 2003). Houlahan and Findley found that amphibian species richness is correlated to forest cover, road density, proportion of wetlands, wetland size, and water nitrogen levels and that community composition is impacted through a complex suite of land use effects, including loss of habitat, diminished dispersal ability, declining water quality, and increased exposure to toxic substances.

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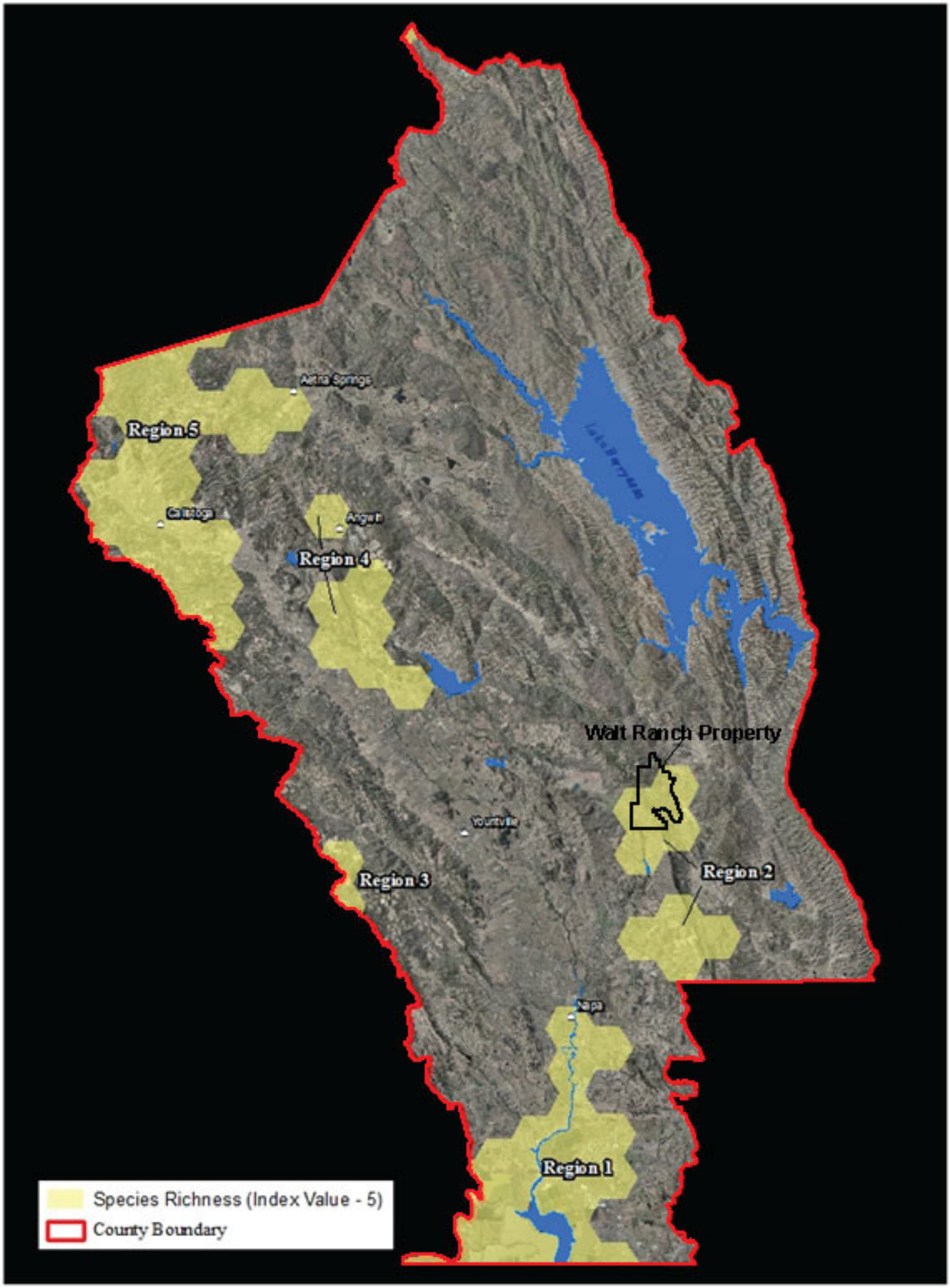
Figure 1: Overlay of Walt Ranch Project Site and Core Species-rich Regions of Napa County



Source: Link, E.E. 2012. A modeling and geospatial approach to predicting effects on biodiversity due to vineyard expansion in Napa County. Master's Thesis. California State University, Sacramento. 96 pp.

Figure 1: Overlay of Walt Ranch Project Site and Core Species-rich Regions of Napa County

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Proposed measures for special-status amphibians and reptiles and their habitats are few and inadequate and do not reduce impacts to less than significant; further, when viewed cumulatively with impacts that have occurred with previously vineyard expansions, this project will have significant, unmitigable impacts to biological resources.

Signed,

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SUMMARY

I am a highly skilled field and research scientist with an earned doctorate in zoology, specifically herpetology and disease ecology. My expertise is focused on wildlife conservation, wetland ecology, mammalogy, herpetology, and invertebrate zoology with extensive research, field and laboratory experience. I am a seasoned field biologist with over 17 years' experience working extensively with state and federal agencies, nonprofit organizations, utility companies, and private industry. I have taught and mentored numerous students and professionals in the classroom and in the field, including training state, federal and local agency personnel, in small mammal and amphibian trapping techniques and species identification. I am highly knowledgeable regarding ESA, Section 7 consultations, rendering of Biological Opinions and the CEQA/NEPA and ACOE permit processes including the generation and critical analyses of reports. I have conducted dozens of protocol surveys for numerous special-status species including California red-legged frogs, California tiger salamanders, salt marsh harvest mice, and vernal pool fairy and tadpole shrimp. My research on amphibian disease in the west coast has been widely published in local, national, and international journals. Non-traditional background as an older female, veteran of Native American heritage has given me skills to work and communicate effectively with people from a wide variety of educational, cultural and ethnic backgrounds. Former career as an operating room nurse for 15 years also brings some unique skills to the field.

EDUCATION

Ohlone College, Fremont, CA	1993	A.A. Natural Science
San Jose State University, San Jose, CA	1996	B.S. Conservation Biology (*Magna cum laude*)
San Jose State University, San Jose, CA	1999	M.S. Conservation Biology (*Magna cum laude*)
Southern Illinois University, Carbondale, IL	2009	Ph.D. Zoology

EXPERIENCE

2011	President and Owner, California Environmental Services LLC
2010-2011	Senior Managing Biologist, Insignia Environmental, Palo Alto, CA
2009-2010	Researcher/lecturer, Human Genetics, Senior Seminar, Southern Illinois University, Carbondale, IL
2007-2008	Graduate Teaching Assistant, Non-majors Biology , Southern Illinois University, Carbondale, IL
2000-2009	CEO, Rana Resources, Fremont, CA
2000-present	Senior Associate Biologist, Live Oak Associates, San Jose, CA.
2000-2003	Associate Biologist, Olberding Environmental, Sacramento, CA
2000-2003	Associate Wildlife Biologist, Zander Associates, Novato, CA

1999-2000	Senior Wildlife Biologist, LFR-Levine-Fricke, Emeryville, CA
1995-1999	Wildlife Biologist, H. T. Harvey & Associates, San Jose, CA.
1995-1997	Graduate Teaching Assistant, Invertebrate zoology, biostatistics; San Jose Sate University, San Jose, CA
1978-1993	Operating room scrub nurse, The Surgical Staff, San Francisco Bay Area, CA

PROFESSIONAL PERMITS HELD

Federal Endangered Species Permit # PRT TE0066112-6 (vernal pool invertebrates, *Rana draytonii*, *Ambystoma californiense*, and *Reithrodontomys raviventris*)

California Memorandum of Understanding for *Reithrodontomys raviventris* (northern and southern subspecies), Amphibian and Reptile Species of Special Concern.

California Scientific Collecting Permit #SC-000852. (Covers all mammal, amphibian and reptile Species of Special Concern).

PROFESSIONAL AFFILIATIONS

- American Society of Mammalogists
- The Wildlife Society, Western Section, Native People's Working Group, Disease Ecology Working Group
- Wildlife Disease Association
- Society for Conservation Biology
- Ecological Society of America
- American Society of Ichthyologists and Herpetologists
- AISES (American Indian Science and Engineering Society)
- SSAR; Society for the Study of Amphibians and Reptiles
- DAPTF; Declining Amphibians Populations Taskforce
- PARC; Partners in Amphibian and Reptile Conservation
- **Board Member**: Reforesting America Inc.

HONORS, AWARDS, AND GRANTS

- Washington State Wildlife Grant, co-PI, "Chytridiomycosis in Oregon spotted frogs", 2009 ($825,000.00)
- Sigma Xi Grant, 2008
- Dissertation Research Improvement Grant, 2008
- James R Walker Fellowship, 2006
- National Science Foundation (NSF) Fellowship- "BRIDGE to the Doctorate", 2004
- ARCS (Achievement Rewards for College Scientists) scholar, San Jose State University, 1995 ($5,000.00)
- ARCS (Achievement Rewards for College Scientists) scholar, San Jose State University, 1994 ($5,000.00)
- Dean's List, San Jose State University, 1993-1996
- Dean's Scholar Award, San Jose State University, 1995

- Karin A. Nelson Conservation Biology Scholar, San Jose State University, 1994 ($500.00)
- Alpha Gamma Sigma Honor Society Academic Excellence Scholarship, Ohlone College, 1993 ($500.00)
- President's Recognition of Outstanding Achievement, Ohlone College, 1988 and 1990
- Phi Kappa Phi Honor Society Lifetime Member
- Alpha Gamma Sigma Honor Society Lifetime Member
- President's Scholar, Ohlone College, 1989-1993

MANUSCRIPTS REVIEWED FOR JOURNALS

Diseases of Aquatic Organisms
Herpetological Conservation and Biology
Herpetological Review
Journal of Herpetological Medicine and Surgery
Journal of Mammalogy
Journal of Wildlife Diseases
Journal of Wildlife Management
Northwestern Naturalist
Transactions of the Western Wildlife Society

MAJOR PAPERS PRESENTED AT SCIENTIFIC MEETINGS

Padgett-Flohr, G.E. 2012. Landscape epidemiology of *Batrachochytrium dendrobatidis* in Central California. Contributed paper presented on February 3, 2012 at the 58th annual meeting of the Western Section of the Wildlife Society, held at the Woodlake Hotel, Sacramento, California.

Padgett-Flohr, G.E. 2012. Terbinafine hydrochloride as a treatment for Batrachochytrium dendrobatidis infection. Contributed paper presented on January 12, 2011 at the 20th annual meeting of the Declining Amphibian Populations Task Force- California-Nevada Working Group, held in Placerville, California.

Padgett-Flohr, G.E. 2011. Landscape epidemiology of *Batrachochytrium dendrobatidis* in Central California. Contributed paper presented January 7, 2011 at the 19th annual meeting of the Declining Amphibian Populations Task Force- California-Nevada Working Group, held at the Yosemite Lodge, Yosemite, California.

Padgett-Flohr, G.E. 2009. *Batrachochytrium dendrobatidis* in Central California. Dissertation defense presented March 5, 2009 in Life Sciences III auditorium, Department of Zoology, Southern Illinois University, Carbondale, Illinois.

Padgett-Flohr, G.E. 2009. Pathogenicity of *Batrachochytrium dendrobatidis* to Two Threatened California Amphibians: *Rana draytonii* and *Ambystoma californiense*. Contributed paper to be presented January 15, 2009 at the 18th annual meeting of the Declining Amphibian Populations Task Force- California-Nevada Working Group, held at the Bodega Marine Laboratory, Bodega Bay, California.

Padgett-Flohr, G.E. 2009. Amphibian Chytridiomycosis: A Novel Pathogen Approaching Endemism in California. Contributed paper to be presented January 15, 2009 at the 18th annual meeting of the Declining Amphibian Populations Task Force- California-Nevada Working Group, held at the Bodega Marine Laboratory, Bodega Bay, California.

Padgett-Flohr, G.E. 2008. Amphibian Chytridiomycosis: A Novel Pathogen Approaching Endemism in California. Contributed paper to be presented November 9, 2008 at 15th Annual Conference of The Wildlife Society held at the Hyatt Regency in Miami, Florida.

Padgett-Flohr, G. E. 2008. Disease Ecology and Amphibians: The New Frontier. Invited paper presented February 14, 2008 at the Pacific Northwest chapter meeting of The Wildlife Society, held at the Salishan Golf and Spa Resort in Lincoln City, Oregon.

Padgett-Flohr, G. E. 2008. Pathogenicity of *Batrachochytrium dendrobatidis* to Two Threatened California Amphibians: *Rana draytonii* and *Ambystoma californiense*. Invited paper presented February 14, 2008 at the Pacific Northwest chapter meeting of The Wildlife Society, held at the Salishan Golf and Spa Resort in Lincoln City, Oregon.

Padgett-Flohr, G. E. 2007. Evaluation of Tadpole Mouthparts Depigmentation as a Diagnostic Test for Infection by *Batrachochytrium dendrobatidis* for Four California Anurans. Contributed paper presented on July 13, 2007 at the 87th annual meeting of the American Society of Ichthyologists and Herpetologists, held at the Hyatt Regency in St. Louis, Missouri.

Padgett-Flohr, G. E. 2005. Amphibian Chytridiomycosis in Central California. Contributed paper presented March 19, 2005 at the 8th annual meeting of the Louis Stokes Alliance for Minority Participation (LS-AMP) Student Research Symposium held at the Hyatt Lodge, McDonald's Campus Oakbrook, Illinois.

Padgett-Flohr, G. E. 2004a. Amphibian Diseases as a Factor in Declining Amphibians: Why Didn't We Think of This Before? Contributed paper presented on January 15, 2004, at the 13th annual meeting of the Declining Amphibian Populations Task Force- California-Nevada Working Group, held at the University of Nevada, Reno, Reno, Nevada.

Padgett-Flohr, G. E. 2004b. Amphibian Chytridiomycosis and California Amphibians. Contributed paper presented on January 15, 2004, at the 13th annual meeting of the Declining Amphibian Populations Task Force- California-Nevada Working Group, held at the University of Nevada, Reno, Reno, Nevada.

Padgett-Flohr, G. E. 2004c. Amphibian Diseases and California Amphibians. Contributed paper presented on February 26, 2004 at the 50th annual meeting of the Western Section of the Wildlife Society, held at the Doubletree Hotel, Rohnert Park, California.

Padgett-Flohr, G. E. 2003. Amphibian Diseases as a Factor in Declining Amphibians: Why Didn't We Think of This Before? Invited Paper presented on May 8, 2003 at the 2003

Southern California Sensitive Amphibians and Reptiles Workshop sponsored by California Department of Fish and Game and the Western Section of the Wildlife Society held at the Marriott Convention Center, Riverside, California.

Padgett-Flohr, G. E. 2002. History of the Salt Marsh Harvest Mouse in San Francisco Bay. Invited Paper presented to the U.S. Fish and Wildlife Service on October 15, 2002 at the Don Edwards San Francisco Bay National Wildlife Refuge, Fremont, California.

Padgett-Flohr, G. E. 2002. Amphibian Diseases. The Bandwagon: Chytridiomycosis. Invited Paper presented on May 4, 2002 at the 2002 Bay Area Amphibian Workshop sponsored by the Bay Area Chapter of the Western Section of the Wildlife Society held at Sonoma State University, Cotati, California.

Padgett-Flohr, G. E. 2001. Ecology and Microhabitat Associations of the salt marsh harvest mouse in a southern San Francisco muted tidal marsh. Presented February 24, 2001 at the 2001 annual conference of the Western Section of the Wildlife Society, held at the Radisson Hotel, Sacramento, California.

Padgett-Flohr, G. E., and M. R. Jennings. 2001. Introduction to the workshop entitled "Wildlife Biologists and Endangered Species Permits: Separating Fact from Fiction, Fantasy, and Reality". Invited paper presented on February 22, 2001 at the 2001 annual conference of the Western Section of The Wildlife Society, held at the Radisson Hotel, Sacramento, California.

Padgett-Flohr, G. E. 1999. A random sampling technique: Detecting distributional patterns and microhabitat preferences of *Reithrodontomys raviventris* in a southern San Francisco diked marsh. Presented June 24, 1999 at the 79th Annual Meeting of the American Society of Mammalogists held at the University of Washington, Seattle, Washington.

POSTERS PRESENTED AT SCIENTIFIC MEETINGS

Padgett-Flohr, G. E. 2007. CCADC: A website with something for everyone. Presented November 5, 2007 at the first international meeting on Amphibian Declines and Chytridiomycosis, held at the Hyatt Regency in Tempe, Arizona.

Padgett-Flohr, G. E., C. Rombough, M. Hayes and J. Engler. 2007. Amphibian chytridiomycosis at Conboy Lake Wildlife Refuge. Presented November 5, 2007 at the first international meeting on Amphibian Declines and Chytridiomycosis, held at the Hyatt Regency in Tempe, Arizona.

WORKSHOPS Invited Speaker/Teacher for Field Trips:

February 27- March 2, 2007. Workshop on Amphibian Health Examinations and Disease Monitoring. Invited speaker: Evaluation of Tadpole Mouthparts as a Diagnostic for

Infection by *Batrachochytrium dendrobatidis*. Sponsored by U. S. Fish and Wildlife Service. Held at the National Conservation Training Center, Shepherdstown, West Virginia.

March 19, 2005. Is Graduate School For You? Moderator- 10-member panel discussion. Invited panel held March 19, 2005 at the 8th annual meeting of the Louis Stokes Alliance for Minority Participation (LS-AMP) Student Research Symposium held at the Hyatt Lodge, McDonald's Campus Oakbrook, Illinois.

February 2, 2004. Elkhorn Slough Amphibian Summit. Invited participant providing input and information on amphibian diseases and decontamination procedures. Held at Elkhorn Slough National Estuarine Reserve, Santa Cruz, California.

May 8-10, 2003. Workshop on Southern California Sensitive Amphibians and Reptiles. Sponsored by the Western Section of the Wildlife Society and California Department of Fish and Game. Held at Marriott Convention Center, Riverside, California.

May 4-5, 2002. Workshop on Bay Area Amphibians. Sponsored by the Bay Area Chapter of the Western Section of the Wildlife Society. Held at Sonoma State University, Cotati, California.

April 8-10, 2002. Workshop on California Red-Legged Frogs. Sponsored by Sacramento-Shasta Chapter of the Western Section of the Wildlife Society. Held at Marconi Center in Point Reyes, California.

February 22, 2001. Workshop on Wildlife Biologists and Endangered Species Permits: Separating Fact from Fiction, Fantasy, and Reality. Conducted at the 2001 annual conference of the Western Section of The Wildlife Society. Held at the Radisson Hotel, Sacramento, California.

April 5-7, 2001. California's Living Grasslands: Restoration and Management for Wildlife. Conducted at the California Native Grass Association's Annual Meeting and Field Tour. Held at the Goodwin Forum, Humboldt State University, Arcata, California.

June 13-17, 2001. Workshop on Sensitive Amphibians of the Sierra Nevada. Sponsored by the Western Section of the Wildlife Society. Held at Holiday Inn, Fresno, California.

April 26, 2000. Workshop on the Biology and Management of Amphibians of Northern California. Conducted by the California North Coast Chapter of The Wildlife Society. Held at Korbel School House, Korbel, California.

July 11-13, 2000. Workshop on the Ecology and Management of Sensitive Amphibians in the Sierra Nevada. Conducted by the U.S. Forest Service. Held at Freedom Hall, Veterans Center, Clovis, California.

PUBLICATIONS

Peer Reviewed:

Conlon, J.M., L.K. Reinert, M. Mechkarska, M. Prajeep, M. Meetani, L. Coquet, T. Jouenne, M.P. Hayes, G. Padgett-Flohr, L. Rollins-Smith. ***In press***. Evaluation of the skin peptide defences of the Oregon spotted frog *Rana pretiosa* against infection by the chytrid fungus *Batrachochytrium dendrobatidis*. Developmental and Comparative Immunology.

Wilcox, J.T., G.E. Padgett-Flohr, and J. Johnson. ***In press***. Does paedomorphosis occur in the California tiger salamander (*Ambystoma californiense*)? Southwestern Naturalist.

Padgett-Flohr, G.E., and M.P. Hayes. 2011. Assessment of the Vulnerability of the Oregon spotted frog (*Rana pretiosa*) to the amphibian chytrid fungus (*Batrachochytrium dendrobatidis*). Herpetological Conservation and Biology 6(2):99-106.

Conlon, J.M., M. Mechkarska, E. Ahmed, L. Coquet, T. Jouenne, J. Leprince, H. Vaudry, M. P. Hayes, G. Padgett-Flohr. 2011. Host defense peptides in skin secretions of the Oregon spotted frog *Rana pretiosa*: implications for species resistance to chytridiomycosis. Developmental and Comparative Immunology 35:644-649.

Bowerman, J., C. Rombough, S. Petrakis, and G.E. Padgett-Flohr. 2011. Terbinafine hydrochloride as a treatment for *Batrachochytrium dendrobatidis* infection. Journal of Herpetological Medicine and Surgery 20(1):24-28.

Padgett-Flohr, G.E. and R. L. Hopkins, II. 2010. Landscape epidemiology of *Batrachochytrium dendrobatidis* in Central California. Ecography 33:1-10.

Hayes, M. P., C. J. Rombough, G.E. Padgett-Flohr, L. A. Hallock, J. E. Johnson, R. S. Wagner, and J. D. Engler. 2009. Detection of *Batrachochytrium dendrobatidis* in a wild population of *Rana pretiosa*. Northwestern Naturalist 90:148-151.

Padgett-Flohr, G.E. and R. L. Hopkins, II. 2009. *Batrachochytrium dendrobatidis*: A Novel Pathogen Approaching Endemism in Central California**.** Diseases of Aquatic Organisms 83(1):1-9.

Kolby, J.E., G.E. Padgett-Flohr, and R. Field. 2009. Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) in Cusuco National Park, Honduras. Diseases of Aquatic Organisms Special Issue 4:pp3; doi: 10-3354/dao02055.

Kolby, J.E., and G.E. Padgett-Flohr. 2009**.** Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) in Honduras: Historical Exposure in *Plectrohyla dasypus* and Subsequent Decline. Herpetological Review 40(3):307-308.

Padgett-Flohr, G.E. 2008. Pathogenicity of *Batrachochytrium dendrobatidis* in two threatened California amphibians: *Rana draytonii* and *Ambystoma californiense*. Herpetological Conservation and Biology 3(2):182-191.

Padgett-Flohr, G.E. and M.E. Goble. 2007. Evaluation of Tadpole Mouthparts Depigmentation as a Diagnostic Test for Infection by *Batrachochytrium dendrobatidis* for Four California Anurans. Journal of Wildlife Diseases, 43(4):600-699.

Padgett-Flohr, G.E. and J.E. Longcore. 2007. Detection of *Batrachochytrium dendrobatidis* in a wild population of *Taricha torosa*. Herpetological Review, 38(2):176-177.

Padgett-Flohr, G.E. 2007. Chytridiomycosis: An Informational Brochure for the Field Biologist. Peer-reviewed by Rick Speare, Lee Berger and Joyce Longcore. Used in workshops on sensitive amphibians; distributed amongst the agencies for internal use.

Padgett-Flohr, G.E., T. Bommarito and D. Sparling. 2007. Amphibian Chytridiomycosis in Commercially Purchased Research Amphibians. Herpetological Review, 38(4):390-393.

Padgett-Flohr, G.E. 2006. A Field Biologist's Guide to Amphibian Diseases. Chapter in: Guide to Amphibians and Reptiles of San Diego County. U. C Press, Berkeley, CA.

Padgett-Flohr, G.E. and J.E. Longcore. 2005. Detection of *Batrachochytrium dendrobatidis* in a wild population of *Ambystoma californiense*. Herpetological Review, 36(1):50-51.

Padgett-Flohr, G.E. and L. Isakson. 2003. A Random Sampling of Salt Marsh Harvest Mice in a Muted Tidal Marsh. Journal of Wildlife Management, 67(3):646-653.

Padgett-Flohr, G.E., and M.R. Jennings. 2002. An economical safe house for small mammals in pitfall traps. California Fish and Game, 87(2):72-7.

Padgett-Flohr, G.E. 2002. Survey Protocol for Salt Marsh Harvest Mice and Other Small Mammals. For: P. R. Olofson (editor). Baylands Ecosystem Species Protocols for Key Plants, Fish and Wildlife. San Francisco Bay Area Wetland Goals Project, San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Padgett-Flohr, G.E., and M.R. Jennings. 2002. Survey Protocol for California Red-legged Frog, *Rana aurora draytonii*. For: P. R. Olofson (editor). Baylands Ecosystem Species Protocols for Key Plants, Fish and Wildlife. San Francisco Bay Area Wetland Goals Project, San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Padgett-Flohr, G.E. and J.D. Reeve. ***In prep***. Modeling pathogen geo-diffusion for *Batrachochytrium dendrobatidis* in Central California.

Other:

01. Duke, R., H. Shellhammer, G. Flohr and M. Baca. 1997. Coyote Creek Flood Control Project Reach 1A Marsh Management Area 1997 Monitoring Report. Final report prepared for the Santa Clara Valley Water District. San Jose, California. H. T. Harvey and Associates, Alviso, California. [Project No. 0182-30]. 21 pp.

02. Duke, R. R., A. G. Gordus, G. Flohr and H. Shellhammer. 1997. Naval Weapons Station, Concord Small Mammal Characterization 1997. Final report prepared for Tetra-Tech Em, Inc. San Francisco, California. H. T. Harvey and Associates, Alviso, California. [Project No. 0505-12]. 34 pp.

03. Duke, R., S. Terrill, D. G. Ainley, G. Flohr, M. Jennings, H. Shellhammer, L. B. Spear, and E. Webb. 1997. TOSCO 206 pipeline spill site assessment of wildlife use. Final report prepared for Montgomery Watson, Walnut Creek, California. H. T. Harvey and Associates, Alviso, California. [Project No. 1279-01]. 19 pp.

04. Duke, R. R. S. Terrill, G. Flohr, M. Jennings, H. Shellhammer, and J. Seay. 1998. Ecological Inventory NAS Fallon (Nevada); Small Mammal Community Characterization. Final report prepared for Ted Donn. H. T. Harvey and Associates, Alviso, California. [Project No. 1034-01].

05. Duke, R., P. Boursier, G. Flohr, H. Shellhammer and B. Cleary. 1998. Salt Marsh Harvest Mouse Determinations: Lincoln Center IV Foster City, CA. Final report prepared for Lincoln Property Company, Foster City, California. H. T. Harvey and Associates, Alviso, California. [Project No. 1133-01]. 16 pp.

06. Duke, R. R., R. A. Hopkins and G. Flohr. 1998. Newark-Magnesium Transmission Line Reconductoring Project: Biological Monitoring Report. Final report prepared for Mary Boland, P G & E. H. T. Harvey and Associates, Alviso, California. [Project No. 1298-01].

07. Duke, R. R., P. Boursier, E. Webb, S. Rottenborn, M. Baca and G. Flohr. 1998. Cooley Landing Wetland Restoration Biological Assessment. Final report prepared for Rhone-Poulenc Inc., Research Triangle Park, North Carolina. H. T. Harvey and Associates, Alviso, California. [Project No. 0491-05]. 28 pp.

08. Duke, R. R., R. A. Hopkins, G. Flohr and R. White. 1998. Dublin Ranch Fairy Shrimp Surveys 1997/1998 Wet Season. Final report prepared for Ted C. Fairfield, Consulting Civil Engineer, Pleasanton, California. H. T. Harvey and Associates, Alviso, California. [Project No. 0555-17]. 13 pp.

09. Duke, R. R., R. A. Hopkins, M. Jennings, and G. Flohr. Doublewood Golf Course California Tiger Salamander 1997/1998 Mitigation Monitoring Report. 1998. [Project No. 1032-02].

10. Duke, R. R., R. A. Hopkins, M. Jennings, and G. Flohr. 1998a. Dublin Ranch: 1998 special-status amphibian and reptile surveys. Final report prepared for Ted C. Fairfield, Consulting Civil Engineer, Pleasanton, California. . H. T. Harvey and Associates, Alviso, California. [Project No. 555-21]. i+15 p.

11. Duke, R. R., R. A. Hopkins, M. Jennings, and G. Flohr. 1998b. Lin/Livermore: 1998 special-status amphibian and reptile surveys. Final report prepared for Ted C. Fairfield, Consulting Civil Engineer, Pleasanton, California. H. T. Harvey and Associates, Alviso, California. [Project No. 673-10B]. i+12 p.

12. Duke, R. R., R. Hopkins, P. Boursier, B. Cleary, G. Flohr, M. Jennings, S. Townsend, and R. White. 1998. Pao Yeh Lin Property, special-status species surveys. Final report prepared for Ted C. Fairfield, Consulting Civil Engineer, Pleasanton, California. H. T. Harvey and Associates, Alviso, California. [Project No. 555-18]. ii+21 p.

13. Duke, R. R., R. A. Hopkins, G. Flohr and R. White. 1998. Lin/Livermore Properties Fairy Shrimp Surveys. Final report prepared for Ted C. Fairfield, Consulting Civil Engineer,

Pleasanton California. H. T. Harvey and Associates, Alviso, California. [Project No. 0673-15].

14. Duke, R. R., R. A. Hopkins, and G. Flohr. 1999. Pao Yeh Lin Property Fairy Shrimp Surveys 1998/1999 Wet Season. [Project No. 0555-27].

15. Duke, R. R., R. A. Hopkins, M. Jennings, and G. Flohr. 1999. Cinnabar Hills (Tradition) Golf Club California Tiger Salamander 1998/1999 Mitigation Monitoring Report. [Project No. 0957-10].

16. Duke, R. R., R. A. Hopkins, M. Jennings, and G. Flohr. 1999. Doublewood Golf Course California Tiger Salamander 1998/1999 Mitigation Monitoring Report. [Project No. 1032-02].

17. Duke, R. R., R. A. Hopkins, M. Jennings, and G. Flohr. 1999. Ranch on Silver Creek California Tiger Salamander Salvage Operation Final Report. Final report prepared for Marylee Guinon, Sycamore Associates, Walnut Creek, California. [Project No. 1315-01]. i+20 p.

18. Stephens, D. D., R. A. Hopkins, M. R. Jennings, and G. Flohr. 1999. Cinnabar (Tradition) Golf Club, California tiger salamander 1997/1998 mitigation monitoring. Final report prepared for the Tradition Golf Club, LLC, San Jose, California. H. T. Harvey and Associates, Alviso, California. [Project No. 957-09]. i+10 p.

19. Duke, R. R., R. Hopkins, P. Boursier, B. Cleary, G. Flohr, M. Jennings, S. Townsend, and R. White. 1999. Pao Yeh Lin Property, special-status species surveys. Final report prepared for Ted C. Fairfield, Consulting Civil Engineer, Pleasanton, California. H. T. Harvey and Associates, San Jose, California. [Project No. 555-23]. ii+17 p.

20. Jennings, M. R., R. R. Duke, G. Flohr, T. P. Haney, and P. A. Hartman. 1999a. Santa Clara Valley Water District western pond turtle distribution and status--1999. Final report prepared for the Santa Clara Valley Water District, San Jose, California. H. T. Harvey and Associates, San Jose, California. [Project No. 1563-01]. i+18 p.+1 appendix.

21. Jennings, M. R., R. R. Duke, G. Flohr, T. P. Haney, and P. A. Hartman. 1999b. Santa Clara Valley Water District California tiger salamander distribution and status--1999. Final report prepared for the Santa Clara Valley Water District, San Jose, California. H. T. Harvey and Associates, San Jose, California. [Project No. 1563-01]. i+20 p.+1 appendix.

22. Jennings, M. R., R. R. Duke, G. Flohr, T. P. Haney, and P. A. Hartman. 1999c. Santa Clara Valley Water District western spadefoot distribution and status--1999. Final report prepared for the Santa Clara Valley Water District, San Jose, California. H. T. Harvey and Associates, San Jose, California. [Project No. 1563-01]. i+10 p.

23. Jennings, M. R., R. R. Duke, G. Flohr, T. P. Haney, and P. A. Hartman. 1999d. Santa Clara Valley Water District foothill yellow-legged frog distribution and status--1999. Final report prepared for the Santa Clara Valley Water District, San Jose, California. H. T. Harvey and Associates, San Jose, California. [Project No. 1563-01]. i+17 p.+1 appendix.

24. Jennings, M. R., R. R. Duke, G. Flohr, T. P. Haney, and P. A. Hartman. 1999e. Santa Clara Valley Water District San Francisco garter snake distribution and status--1999. Final report prepared for the Santa Clara Valley Water District, San Jose, California. H. T. Harvey and Associates, San Jose, California. [Project No. 1563-01]. i+15 p.+1 appendix.

25. Padgett-Flohr, G. E. and M. Zander. 2001. Scientific Review and Analysis of: First Year Results (1999-2000) of Required Least Bell's Vireo Surveys Conducted under the Regional 404 Five-Year Channel Maintenance Program: Permit #22309S Monterey County, California. Final report prepared for the MCWRA Monterey, California. Zander Associates, Novato, California. [Project No. NHE-1]. 8 pp.

26. Padgett-Flohr, G. E. and L. Zander. 2001. Interstate 580/Vasco Road Interchange Project Natural Environment Study; Livermore, California. Final report prepared for Public Affairs Management, San Francisco, California. Zander Associates, Novato, California. [Project No. PAM-1]. 15 pp.

27. Flohr, G. E., M. R. Jennings, W. C. Hooper and D. J. Hartesveldt. 2001. Drayer Mitigation Bank: Special-Status Surveys For Invertebrates, Amphibians And Birds 2001. Final report prepared for Rick Drayer, Merced, California. Live Oak Associates, Oakhurst, California [Project No. 235-04]. 33 pp.

28. Padgett-Flohr, G.E. 2001. Summary of SMHM Trapping at Breuner Marsh, Contra Costa, California. 2001. Final report prepared for Olberding Associates San Jose, California.

29. Padgett-Flohr, G.E. 2003. Soil Analysis for evidence of Federally Listed Large Branchiopods at the Bell Mountain Project, Riverside County, California. Final report prepared for Olberding Associates, San Jose, California. 6 pp.

30. Padgett-Flohr, G.E. 2003. Final Report on Burrowing Owl Surveys Hidden Meadows Property, Menifee, California. Prepared for Olberding Associates, San Jose, California. 16 pp.

31. Padgett-Flohr, G.E. 2003. Coyote Creek Flood Control Project Reach 1a Marsh Management Area, 2003 SMHM Monitoring Report. Prepared for the Santa Clara Valley Water District. 24 pp.

32. Padgett-Flohr, G.E. 2004. Biological Constraints Analysis, Geotechnical Sampling for the Bay Division Pipeline Tunnel, San Francisco Public Utilities Commission South San

Francisco Bay, California. Final report prepared for the Water Infrastructure Partners, San Francisco, California. 41 pp.

33. Padgett-Flohr, G.E. 2004. Summary of Biological Monitoring of Clean Up Activities at Breuner Marsh, Contra Costa, California. 2004. Final report prepared for Olberding Associates San Jose, California.

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