

EXHIBIT 6-A



Sponsored Projects Office

University of California, Berkeley
1608 Fourth St, Suite 200
Berkeley, CA 94710



Principal Investigator: Jennifer Hunter
Sponsor: Monterey Peninsula Water Management District
Title: Finch Creek Ford Replacement - Planning
Reference: Phoebe 24175

Please accept the enclosed proposal submitted on behalf of The Regents of the University of California, Berkeley campus. Should this proposal be selected for funding, the award documents should be issued using the information provided below.

Endorsed for the Regents by:

12/19/19

Jessie Brown
Contract and Grant Officer
Sponsored Projects Office

If you have any questions or need additional information regarding this proposal, please contact:

Jessie Brown
Contract and Grant Officer
Phone: (510) 642-8120
Email: jwbrown@berkeley.edu

<p>AWARDS SHOULD BE MADE TO:</p> <p>The Regents of the University of California</p> <p>c/o Sponsored Projects Office University of California, Berkeley 1608 Fourth Street Berkeley, CA 94710</p> <p>email address for electronics awards: spoawards@berkeley.edu</p> <p>Main Office: (510) 642-0120 Fax: (510) 642-8236 Website: http://spo.berkeley.edu</p>	<p>CHECKS SHOULD BE MADE PAYABLE TO:</p> <p>The Regents of the University of California</p> <p>CHECKS SHOULD BE SENT TO:</p> <p>Contracts & Grants Accounting attn: Elizabeth Chavez, Interim CGA Director University of California, Berkeley 2195 Hearst Avenue, Room 130F Berkeley, CA 94720-1103 Telephone: (510) 642-1371 Fax: (510) 643-7628 email: cgaawards@berkeley.edu</p>
---	--

EXHIBIT 6-A

PROJECT NARRATIVE

The Hasting Natural History Reservation is located in the upper Carmel River Valley. Hastings has been a biological field station of UC Berkeley since 1937, and is one of the oldest field stations in the world. Hastings has been the site of hundreds of research studies documenting biological processes, geology and the cultural history of our region. The reserve is 2,500 acres in size and includes oak woodlands, chaparral and hardwood forest habitats.

Hastings also has three creeks that flow through the reserve, fed from a 22 mi² watershed. (Figure 1). While all three are considered to be seasonal creeks, the largest, Finch Creek, a tributary of Cachagua Creek, periodically flows year-round. In 1988 the University purchased a 2 acre parcel adjacent to the reserve at 38501 E. Carmel Valley Rd. to house the incoming Hastings Reserve director. This parcel included a low concrete ford crossing Finch Creek. In 1995 the ford was inundated and undercut during a flood. It was reinforced in 1996 with additional concrete and stone to protect existing utility lines and to maintain the structural integrity of the crossing. Since this time there has been significant sediment deposition upstream of the ford, and channel incision downstream of the ford has created a 6' plunge pool.

During high flows Finch Creek flows over the ford, and during low flows the creek runs through four small (10"-12") culverts imbedded in the concrete under the surface of the ford. Threatened Central California coast steelhead migrate from the ocean to spawning grounds in Finch Creek annually and during the late winter months large fish are regularly seen moving through the creek. During periods of high flow the ford is considered a "partial barrier" because adult steelhead are able to pass over the ford, however during low-flow conditions the ford becomes a complete barrier to fish migration (Figure 2).

An assessment by the Monterey Peninsula Water Management District in 2014 identified the Finch Creek ford as the 6th most significant barrier to steelhead passage in four of the major tributaries of the Carmel River watershed. Nearly four miles of excellent spawning and rearing habitat exist upstream of the ford. Since this time other fish passage barriers have been improved or replaced, while the Finch Creek ford remains a major impediment to steelhead migration in the upper watershed. The District and the Carmel River Steelhead Association (CRSA) perform annual rescues of young-of-the-year and juvenile steelhead in the Cachagua Creek watershed in late spring, before seasonal drying. This year the CRSA rescued over 2,600 fish from four sites along Finch Creek, including ~ 1,400 fish upstream of the ford.

The proposed project will begin the process of replacing the Finch Creek crossing to ensure that fish passage to the upper Carmel River watershed can be maintained, in both high- and low-flow years. We are acquiring funds for the planning and engineering phase of the Finch Creek Ford Replacement Project. We propose to engage a contractor to evaluate the geotechnical, hydrological and hydraulic aspects of replacing the current ford with a vehicular bridge that will facilitate passage by steelhead and other aquatic species; as well as, restore normal hydrological processes. The contractor will be responsible for providing 65% plans, submitting these plans to the appropriate agencies for permits, in coordination with UC Berkeley's department of Capital Projects. The contractor will ultimately provide 100% plans, after incorporating input from the

EXHIBIT 6-A

permit agencies and other project stakeholders. The State Coastal Conservancy (SCC) and Trout Unlimited have pledged staff support to assist the University as necessary.

The proposed grant would be instrumental in allowing us to remove of the ford. Hastings does not receive significant financial support from UC Berkeley. Each year we receive a small stipend to help offset operational costs, which translates to less than 10% of our annual budget. The remainder of our costs are paid from user fees and charitable donations. In most years, Hastings operates on a deficit, relying on endowment funds, and periodic large gifts to sustain reserve operations. Hastings has only two employees, and unlike on-campus resources, we are responsible for maintaining all of our facilities, vehicles and communications infrastructure. In the absence of grant funds, we will not have the resources to remove the ford. At present we have the support of the SCC, which administers a settlement fund set up to offset California American Water's excessive diversions from the Carmel River. Subsequent to the planning phase, SCC staff will seek board approval to grant UC Berkeley the balance of funds needed for the construction phase of the project.

BROADER IMPACTS

The ford replacement will not only rectify a piece of failing infrastructure and improve spawning habitat for a imperiled species, but will also provide a unique study and research opportunity for students ranging from elementary to university graduate student level. The mission of the Hastings Reserve is to provide opportunities for research and education. Each year Hastings hosts hundreds of K-12 students, undergraduate courses, and graduate student retreats. These groups regularly inquire about the potential to be involved in data collection for on-going research projects, in order to learn new survey and monitoring techniques. However, current research at Hastings, provides few opportunities to involve visiting students.

The replacement of the ford on Finch Creek will have consequences for aquatic communities up- and downstream of the ford, and will significantly change the hydrology of the stream. We will work with researchers at UC Berkeley to develop a rapid-assessment monitoring protocol, beginning winter/spring 2020 to establish baseline flow and aquatic food web distribution. This effort will include surveying the following: 1. channel geometry, 2. sediment characteristics, 3. large woody debris, 4. the benthic macroinvertebrate community, 5. juvenile steelhead, 6. invasive species and 7. riparian vegetation. These protocols will be provided to visiting student groups to involve student-scientists in our ongoing monitoring work. Additionally, we will train a cohort of interns to help with supervision and survey planning.

We will also work with NOAA fisheries and UC Berkeley scientists to develop an antenna array to allow us to monitor the passage of tagged steelhead below the proposed vehicle bridge. In summer, 2019 NOAA deployed 73 PIT tags in young steelhead upstream of the ford, allowing mark-recapture opportunities in Finch Creek and beyond. It is our hope that steelhead monitoring in Finch Creek will augment other long-term aquatic monitoring programs throughout the watershed and provide additional information about migration timing, and population dynamics of steelhead in the upper watershed.

EXHIBIT 6-A

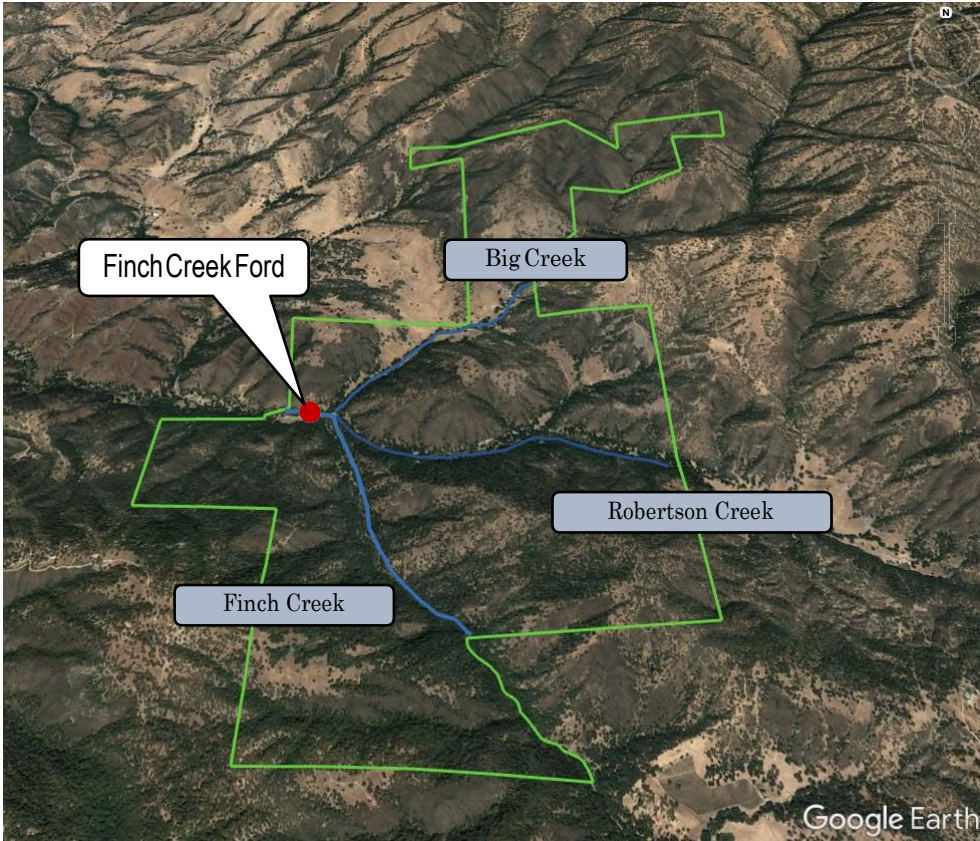


Figure 1. Hastings Reserve boundaries, with creeks. The Finch Creek ford is located near the entrance of the reserve (36.3788024, -121.5664295).

EXHIBIT 6-A

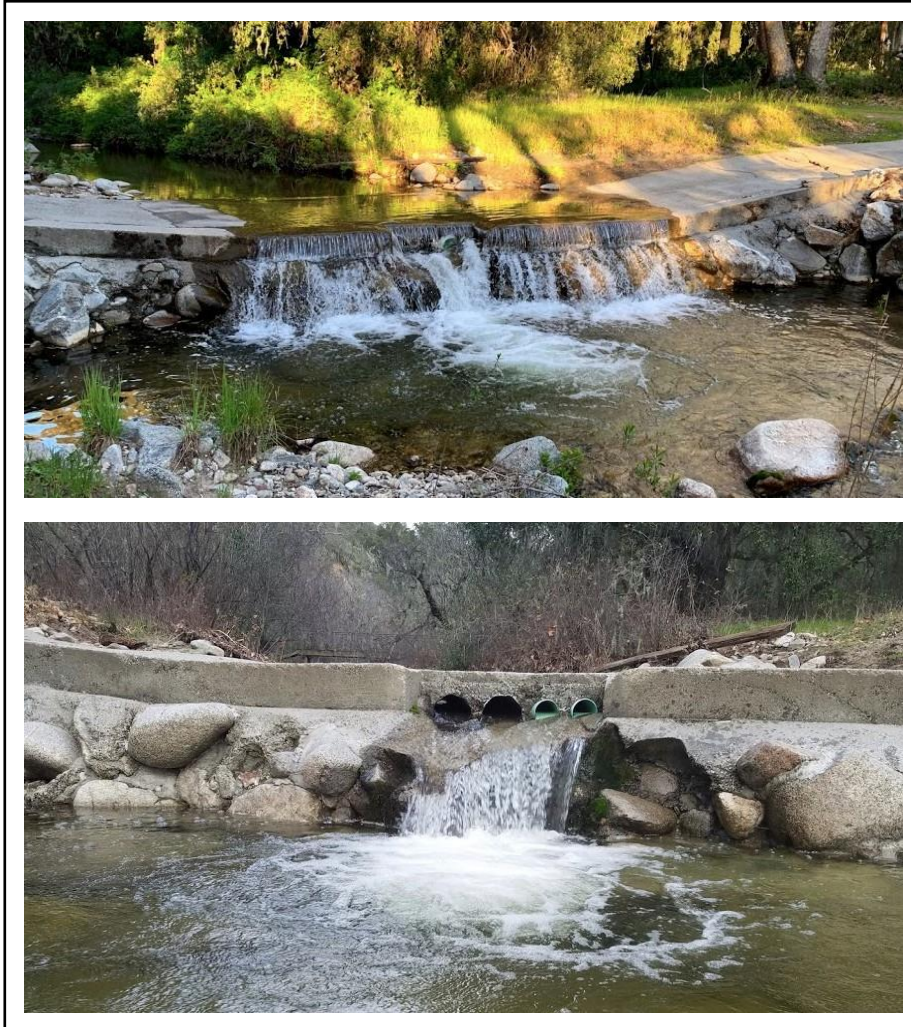


Figure 2: Finch Creek ford during high and low flows.

PHOEBE #:	24175	Federal	N	PERIOD 1	PERIOD 1	TOTAL
Principal Investigator:	Jennifer Hunter	NIH Cap	N	Direct:	100,000 02-01-2020	02-01-2020
RFP/Solicitation:	N/A - emailed solicitation	<u>Proj. Periods</u>		Indirect:	- 12-31-2021	12-31-2021
TOTAL BUDGET:	\$100,000	2 Years		Total:	100,000 23.0 Months	23.0 Months

OTHER THAN PERSONNEL	Description	CS	IDC	INF	Amount	Total	Total
OTHER COSTS: Other:	Contractors/Suppliers	N		0%	100,000	100,000	100,000
SUBTOTAL: OTHER COSTS		UC-Berkeley				100,000	100,000
TOTAL DIRECT COSTS		UC-Berkeley				100,000	100,000
IDC #1 - NONE		UC-Berkeley		0.0%	-	-	-
TOTAL COSTS		UC-Berkeley				100,000	100,000
DIRECT COSTS (NIH)		Direct Costs minus Subcontract F&A):				100,000	100,000

DHHS Cost Allocation Services, Arif M. Karim, 415-437-7820

EXHIBIT 6-A

BUDGET JUSTIFICATION

Other Direct Costs

Contractors/Suppliers: We are requesting \$100,000 to engaging an environmental consulting firm. This contractor will perform necessary geotechnical, hydraulic and hydrologic analyses, and generate a design for a new vehicular bridge or culvert. This new crossing will meet County of Monterey design standards and provide for improved fish passage conditions in accordance with design guidance provided by NOAA Fisheries and the California Department of Fish and Wildlife. The contractor will be responsible for providing at least 65% plans, submitting these plans to the appropriate agencies for permits, and ultimately providing 100% plans, after incorporating input from the permit agencies and other project stakeholders.

Any grant funds remaining after the planning phase is completed will be used for project construction costs.

Indirect Cost Rate

The Monterey Peninsula Water Management District does not allow for indirect costs.

EXHIBIT 6-A

Jennifer S. Hunter

Hastings Natural History Reservation
University of California, Berkeley
38601 E. Carmel Valley Rd
Carmel Valley, CA 93924
email: jshunter@berkeley.edu
tel: (831) 659-2664

EDUCATION

- Ph.D. in Ecology (2008) University of California, Davis
Dissertation: Adaptations to intraguild competition in mesocarnivores.
Advisor: Tim Caro
- B.S. in Wildlife Science (2002) University of Washington
Thesis: Spatial movement in black and white ruffed lemurs (*Vareica variegata*)
Advisor: Steve West

PROFESSIONAL APPOINTMENTS

- | | | |
|-----------------------------|--|--------------------|
| Resident Director | Hastings Natural History Reservation
University of California, Berkeley | 2018-Present |
| Associate Specialist | University of California, Berkeley | 2017-2018 |
| Project Leader | Panthera | 2015-2018 |
| Academic Coordinator | University of California, Berkeley | 2014-2017 |
| Research Analyst | Monterey Bay Aquarium | 2012-2015 |
| Stewardship Volunteer | Audubon California | 2009-2010 |
| Graduate Student Researcher | University of California, Davis | 2008-2009 |
| Graduate Student Researcher | University of California, Davis | 2004 |
| Field Instructor | State University of New York | 2002-2004,
2006 |

RESEARCH EXPERIENCE

- 2015-2018 East Bay Mountain Lion Project: Mountain lion ecology and human-wildlife conflict in a highly fragmented landscape
- 2006-2008 Predator response to aposematic signaling by striped skunks
- 2004-2007 Antipredator behavior of cheetahs in Serengeti National Park
- 2002-2005 Affiliative and agonistic interactions between semi-free ranging coastal bottlenose dolphins
- 2000 Spatial associations and vocalizations in groups of black and white ruffed lemurs
- 1999 Interspecific avoidance by Namibian carnivores

PEER-REVIEWED PUBLICATIONS

Smith J, **Hunter J**, Gaynor K, Keller C, Palmer M, Suraci J, Atkins J, Castañeda I, Cherry M, Garvey P, Huebner S, Morin D, Teckentrup L, Weterings M, Beaudrot L. *In review*. Snapshots across scales: camera traps provide new insights into predator-prey ecology. *Frontiers in Ecology and the Environment*.

Bidder O, di Virgilio A, **Hunter J**, McInturff A, Gaynor K, Smith A, Rossell F. *Accepted*. A novel approach for studying canid scent marking: leveraging advances in data science and biologging techniques. *Scientific Reports*.

Hunter J.S. 2015. King mackerel & Spanish mackerel: U.S. Atlantic, U.S. Gulf of Mexico. Monterey Bay Aquarium Seafood Watch Program. 63pp.

Hunter JS. 2014. Cobia: US Wild-caught. Monterey Bay Aquarium Seafood Watch Program. 62pp.

Hunter JS. 2013. Mahi mahi and Wahoo: US troll fishery. Monterey Bay Aquarium Seafood Watch Program. 42pp.

Hunter JS. 2013. Mahi mahi: Ecuador, Peru and Costa Rica. Monterey Bay Aquarium Seafood Watch Program. 49pp.

Caro T, Stankowich T, Kiffner C, **Hunter J.** 2013. Are spotted skunks conspicuous or cryptic? *Ethology, Ecology & Evolution* 25:144-160.

Hunter JS. 2009. Familiarity breeds contempt: Effects of striped skunk color, shape and abundance on wild carnivore behavior. *Behavioral Ecology* 20: 1315-1322

Hunter JS, Caro TM. 2008. Patterns of interspecific competition in American carnivore families. *Ethology, Ecology and Evolution* 20: 295-324. (Invited article)

Sergio F, Caro TM, Brown D, Clucas B, **Hunter JS**, Ketchum J, McHugh K, Hiraldo F. 2008. Top predators as conservation tools: ecological rationale, assumptions and efficacy. *Annual Review of Ecology, Evolution and Systematics* 39: 1-19

Hunter JS, Durant SM, Caro TM. 2007. Factors affecting scavenger arrival at carcasses in Serengeti National Park. *African Journal of Ecology* 45: 275-281.

Hunter JS, Durant SM, Caro TM. 2007. To flee or not to flee: Scavenger avoidance by cheetahs at kills. *Behavioral Ecology and Sociobiology* 61: 1033-1042.

Hunter JS. 2002. Sex differences in vertical ranging in black and white ruffed lemurs (*Varecia variegata*) in Ranomafana National Park, Madagascar. *American Journal of Primatology* 57 (S1): 30.

SELECT PRESENTATIONS

The Hastings Reserve. 2019. School of Natural Science Seminar Series. Cal State Monterey Bay. Seaside, CA

The Hastings Reserve. 2019. Camel Valley Public Library. Carmel Valley, CA

Skunk's Life. 2019. Monterey County Regional Park District. Camel-by-the-Sea, CA

The Hastings Reserve. 2018. Carmel Foundation, Carmel-by-the-Sea, CA

Skunk's Life. 2018. Oakland 4H Club Seminar, Oakland, CA

Skunks: The Most Interesting Animals in the World. 2018. Wild St. Helena Seminar Series, Napa, CA.

Skunks! 2017. Wild Napa Seminar Series, Napa, CA.

East Bay Mountain Lion Project. 2017. East Bay Regional Park District Stewardship Meeting, San Leandro, CA.

King mackerel, Spanish mackerel. 2015. Monterey Bay Aquarium Seafood Watch Program, Monterey, CA.

Cobia. 2014. Monterey Bay Aquarium Seafood Watch Program, Monterey, CA.

Mahi mahi, wahoo. 2013. Monterey Bay Aquarium Seafood Watch Program, Monterey, CA.

Carnivore avoidance of striped skunks. 2009. Sierra Nevada Aquatic Research Laboratory Seminar Series. Mammoth Lakes, CA.

TEACHING EXPERIENCE

University of California, Berkeley

Research in Trail Design (independent study). Course Instructor 2019

State University of New York

Tropical Marine Ecology (Field Course). Field Instructor 2002-2004, 2006.

Field Methods (Field Course). Field Instructor. 2002-2004, 2006.

University of California, Davis

Behavioral Ecology (WFC 141). Invited Speaker (Warning signals and aposematism). 2008.

Principles of Environmental Science (ESP 110). Invited Speaker (Conserving carnivore habitat). 2007.

HONORS AND FELLOWSHIPS

Biodiversity and Ecosystem Services Training Network Fellow, 2008, Arizona State University

Alliance for Graduate Education and the Professoriate Fellow, 2007, University of California, Davis

Valentine Eastern Sierra Reserve Research Grant, 2007, University of California, Santa Barbara

Institutional Support Fellowship, 2006, University of California, Davis

Graduate Research Fellowship, 2003-2005, National Science Foundation

Non-Resident Tuition Fellowship, 2002, University of California, Davis

Dean's List, 1997-2002, University of Washington

Minority Achievement Award Scholarship, 1997, Western Washington University (*Declined*)

EDITORIAL SERVICE

Animal Behaviour

Behavioral Ecology

Biology Letters

Ecological Research

Journal of Mammalogy

Journal of Wildlife Management

Cornell University

Arctic

Behavioral Ecology and Sociobiology

Ecography

Journal of Animal Ecology

Journal of Natural History

Journal of Zoology

PROFESSIONAL AFFILIATIONS

California Mountain Lion Working Group

EXHIBIT 6-A

JENNIFER S. HUNTER
PAGE 4 OF 4

Society for Conservation Biology
Ecological Society of America
IUCN Small Carnivore Specialist Group



EXHIBIT 6-A
CIRMEI MIDDU SCHOOL
C D U G R R S



Dan Morgan, Principal
Sarah Greco, Counselor

Carmel Unified School District

Jennifer Kasper, Assistant Principal
Melissa Magreta, Counselor

12/16/19

To whom it may concern,

The Carmel River Watershed is an important part of the learning experience for students at Carmel Unified Schools. Six of the seven Carmel Unified Schools lie within the Carmel River Watershed and the river is an integral part of the student experience at all Carmel Unified Schools. The proposed project to the Monterey Water Management District at Hastings Natural History Research Reserve has many valuable opportunities for elementary, middle school, and high school students to study Finch Creek as it travels into the Carmel River. This project would open the doors for many valuable hands-on, inquiry lessons about water chemistry, ecology, history, and natural history.

Last September over 200 seventh graders from Carmel Middle School visited Hasting Natural History Research Reserve as part of the Monterey Bay Outdoor Education Week for the first time in many, many years. Students, teachers, and administrators valued the trip because they were able to connect science, history, and natural history with the unique environment of Carmel Valley. This educational partnership between CUSD and Hastings is something that we want to continue, and a lesson focused around our watershed at Hastings would be a great addition. In conclusion, I support the proposed project and am interested in working with Hastings reserve to develop experiences around the Carmel River Watershed that will students will not forget. Please do not hesitate to contact me if there are any questions.

D eely
dsteely@carmelunified.org

Science Teacher
Habitat Liaison
Instructional Coach
Carmel Unified School District

EXHIBIT 6-A

Carmel River Watershed Conservancy
PO Box 223833, Carmel, CA 93922



Board of Directors:

Michael Waxer, Past President
Lorin Letendre, President
Paul Bruno, Vice President
Abbie Beane, Interim Exec Director
Andy Magnasco, Treasurer
Jennifer Duggan, Secretary
Catherine Stedman
Jen Hunter
Scott Hennessy

Re: Finch Creek Ford Replacement Project grant proposal
December 11, 2019

Dear Monterey Peninsula Water Management District:

The Carmel River Watershed Conservancy (CRWC) is offering its support for the Finch Creek Ford Replacement Project grant proposal (2019). CRWC's primary objective is to restore the health and beauty of the Carmel River, and that includes its threatened species. One of those species is the threatened Central California coast steelhead, which is also a key indicator species for watershed health. This project will address the urgent need to remove the sixth most significant barrier to fish passage among the remaining barriers in the Carmel River and its tributaries. Also, the Carmel River Task Force, which CRWC chairs, lists as one of its highest priorities the removal of fish passage barriers. The Finch Creek ford currently inhibits steelhead from migrating from the ocean back upstream to their spawning grounds.

Hastings Natural History Reservation is well positioned to carry out this work given its history as a UC Berkeley field station for more than 80 years. Hastings brings a unique set of knowledgeable researchers and has supported hundreds of research studies focused on biological processes. The location is perfectly suited to carry out this type of work.

The need for this project is significant. In 1999 the Carmel River, which provides incredible utility and recreation for our region, was listed among the top 10 most endangered rivers in the U.S. While all of our hard work has put the River on a path to restoration, our watershed continues to experience extreme conditions including drought years. In 2019, we saw a record number of steelhead resume their natural migration patterns, however, a record number of juvenile steelhead were also rescued by the Carmel River Steelhead Association, and nearly 15% of those were in Finch Creek alone. It is critical that we continue to support efforts that restore the River to its natural condition.

Sincerely,

A handwritten signature in black ink, appearing to read 'Abbie Beane'.

Abbie Beane
Interim Executive Director



EXHIBIT 6-A

David Stoldt, General Manager
The Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, CA 93940

December 19, 2019

RE: Removal of Fish Barrier on Finch Creek, Hastings Reserve

Dear Mr. Stoldt:

I am writing you in support of a proposed project to remove a barrier to salmon migration on Finch Creek, an important tributary to the Carmel River. Your agency has generously agreed to help fund the removal and replacement of a concrete ford on the Hastings Natural Reserve. Your funding will be critical to plan and design a replacement structure. This project will have multiple benefits including providing fish migration on all flows, restoration of natural sediment transport; as well as, providing reliable all-weather access to the field station's housing. As you may know, the Coastal Conservancy administers the Carmel River Settlement Account, on behalf of NOAA and its partners. We feel that this is a high priority project and a good candidate for funding from the Settlement Account. Therefore, once designs reach a 65% level of completion and permits are obtained, we intend to recommend to the Conservancy board of directors that the Settlement fund be used to complete the project. And UC administration at the Berkeley campus has committed to match our funding commitment by covering its project staff costs. We are very excited to see this project move forward in 2020.

Please contact me at 510 286-7028 if you have any questions or concerns.

Sincerely,

A handwritten signature in cursive script that reads "Tom Gandesbery".

Tom Gandesbery
Project Manager

cc: Jen Hunter, Hastings Reserve