State of California – Department of Fish and Wildlife

SCIENTIFIC COLLECTING PERMIT, SPECIFIC USE – Permit

DFW 1379S (NEW 09/01/17)

Specific Use Permit Details:

Specific Use Permit ID: **S-190980001-19111-001**

Reference Title: **Statewide General SCP**

Hirano, Chad@ Wildlife

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Principal Investigator (PI):

Principal Investigator	PI Status	Approval Status	Conditions
SC-190810006: Michelle S Koo	Active	Approved with Conditions	The Principal Investigator is authorized to independently conduct all wildlife research activities pursuant to this permit and shall have adequate supervision over authorized individuals named on this permit. The Principal Investigator is also responsible for all reporting requirements.

Authorized Individuals (AI):

Authorized Individual	Role	Approval Status	Conditions
SC-191000003: David B Wake	Professor and Curator of Herpetology, MVZ; training and research	Approved with Conditions	See the Wildlife Branch SCP List of Authorized Individuals (LAI, Attachment #2).
SC-190980004: Carol L Spencer	Curator of Herpetology, MVZ; training and research	Approved with Conditions	See the Wildlife Branch SCP List of Authorized Individuals (LAI, Attachment #2).
SC-190940004: Jimmy A McGuire	Professor and Curator of Herpetology, MVZ; training and research	Approved with Conditions	See the Wildlife Branch SCP List of Authorized Individuals (LAI, Attachment #2).
SC-190320013: Rebecca Tarvin	Professor and Curator of Herpetology, MVZ; training and research	Approved with Conditions	See the Wildlife Branch SCP List of Authorized Individuals (LAI, Attachment #2).
SC-190940001: Robert W Hansen	Affiliated researcher, MVZ; research	Approved with Conditions	See the Wildlife Branch SCP List of Authorized Individuals (LAI, Attachment #2).
SC-191110002: Ammon Corl	Post-doctoral Fellow, MVZ; training and research	Approved with Conditions	See the Wildlife Branch SCP List of Authorized Individuals (LAI, Attachment #2).
SC-191360002: Vance T Vredenburg	Professor, San Francisco State Univ. and Affiliated researcher, MVZ; training and research	Approved with Conditions	See the Wildlife Branch SCP List of Authorized Individuals (LAI, Attachment #2).

Permitholder Initials: _____

Approved Targeted Wildlife:

Inland Fisheries Wildlife:

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Marine Wildlife:

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Terrestrial Wildlife:

Approved Targeted Wildlife	Activity / Disposition	Approved Method	Approved Procedure	Approved County	Approved Geographic Location	Approval Status	Conditions
Amphibians (Amphibia); Reptiles (Reptilia)	Sacrifice; Salvage; Capture	Cover Boards; Hand; Hook, Snake; Net, Dip; Net, Hand; Noose, Lizard; Tongs, Snake	Humanely Euthanize	* Statewide	Statewide	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.
Terrestrial and Vernal Pool Invertebrates ()	Capture; Sacrifice	Hand; Net, Hand	Humanely Euthanize	* Statewide	Statewide	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.
Mammals (Mammalia)	Salvage			* Statewide	Statewide	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.
Birds (Aves) [excluding FP, T&E and SSC]	Salvage			* Statewide	Statewide	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.
Amphibians (Amphibia)	Procedure	Hand	Non-invasive swabs		Statewide	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.

Approved Non-Targeted Wildlife (Incidental by-catch)

Inland Fisheries Wildlife:

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Permitholder Initials: _____

Marine Wildlife:

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Terrestrial Wildlife:

Approved Non-Targeted Wildlife	Approved Quantity of Non-Targeted Wildlife	Approval Status	Conditions

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Measures Minimizing Harm of Wildlife:

We employ established Visual Encounter Survey techniques, both during daylight and nighttime hours, with capture methods as listed, which minimizes incidental by-catch unlike active trapping methods such as seining and electroshock, which are more indiscriminant methods. The latter trapping methods will not be employed in our general herpetological surveys. We mostly employ manual methods such as by hand, snare or snake tongs/hook, for the highest capture discrimination. When we search in microhabitat such as turning rocks or logs, we attempt to return conditions to its original condition as much as possible to allow its continued use by wildlife.

To minimize transmission of pathogens, personal and field equipment will be disinfected with standard recommended procedures (e.g., cleaned of debris and dipped in 70% ethanol, bleach solution or Quat-128) between aquatic systems with care that solutions are not contaminating sites.

Method Details:

Taxonomic Group	Approved Methods	Details	Approval Status	Conditions
Wildlife	Hand; Hook, Snake; Net, Dip; Net, Hand; Noose, Lizard; Tongs, Snake	Majority of the time capture methods are by hand. We may use commercially available tools such as snake tongs and hooks especially for venomous snakes, and dip and hand nets (aquarium) for aquatic species. Lizard noose or snares are formed from commercially available light-weight fishing rods or poles and string, not particularly special equipment.	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.

Procedure Details:

Taxonomic Group	Approved Procedures	Details	Approval Status	Conditions
Wildlife	Humanely Euthanize	We use methods for euthanasia of amphibians and reptiles approved by the University of California, Berkeley, Animal Use Protocol committee, which include intracoelomic injections of Benzocaine hydrochloride, diluted and buffered. For amphibians and dependent on availability, we may also use a bath of MS-222 (tricaine methane sulfonate), buffered, for aquatic species or stages. Both methods have been used for years with little or no outward signs of stress for the animals and have been considered standard humane methods of euthanasia for herpetofauna. See attached UC Berkeley IACUC protocol attachment.	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.

Sacrifice of Wildlife Details:

Permitholder Initials: _____

Taxonomic Group	Approved Wildlife to be Sacrificed	Approved Quantity	Approval Status	Conditions
Wildlife	Amphibians (Amphibia); Reptiles (Reptilia); Terrestrial and Vernal Pool Invertebrates ()	Unlimited	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions. See Condition #7 for sacrifice of amphibians and reptiles.

Details:

As an entity, we request to collect: 1) no more than eight specimens per non-listed amphibian and reptile species per locality, statewide in all counties; 2) no more than one egg lot or larval lot (maximum 20 eggs or 20 larvae per lot) per amphibian species per locality, statewide in all counties; 3) one specimen per species of special concern per undocumented locality, statewide in all counties; and 4) incidental terrestrial invertebrates excluding standard and additions to standard exceptions. Specimen totals are cumulative and shall not exceed the combined efforts of all researchers associated with MVZ herpetological surveys.

All specimens under this permit will be deposited at the Museum of Vertebrate Zoology, University of California, Berkeley, which will allow its metadata and voucher to be accessible to the global scientific community and public.

Salvage of Wildlife Details:

Taxonomic Group	Approved Wildlife to be Salvaged	Approved Quantity	Approval Status	Conditions
Wildlife	Amphibians (Amphibia); Reptiles (Reptilia); Birds (Aves) [excluding FP, T&E and SSC]; Mammals (Mammalia)	Unlimited	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.

Details:

We request any number of salvaged moribund amphibians, reptiles, birds or mammals (Federal Permit No. MB795035, currently in process of renewal, last version attached); these will be prepared as standard amphibian and reptile museum specimens. All specimens under this permit will be deposited at the Museum of Vertebrate Zoology, University of California, Berkeley, which will allow its metadata and voucher to be accessible to the global scientific community and public.

Captivity of Wildlife Details:

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Details:

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Relocation of Wildlife Details:

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Details:

Permitholder Initials: _____

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Geographic Location Details:

Taxonomic Group	Approved County	Approved Locations	Details	Approval Status	Conditions
Wildlife	* Statewide		We request statewide access in all counties. We cannot anticipate where salvage material may be found. At the time of this application, we can anticipate fieldwork to survey for amphibians and reptiles at the Harold Richardson Redwoods Reserve managed by the Save the Redwoods League, Sonoma County, range wide for Hydromantes shastae, H. samweli, H. wintu, Shasta County, and natural history reserves managed by UC Berkeley (eg. Hastings Natural History Reserve, Monterey County; Blue Oak Ranch Reserve, Santa Clara County; Sagehen Creek Reserve, Nevada County) but are not limited to these areas.	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.

Disposition Locations:

Name	Address	City	State	Zip Code	Details	Approval Status	Conditions
Museum of Vertebrate Zoology	3101 Valley Life Sciences, University of California	Berkeley	CA	94720-3160	All salvage or sacrificed amphibian and reptile species. Any incidental invertebrates will be deposited with our sister museum, Essig Museum of Entomology, UC Berkeley.	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.
Essig Museum of Entomology	1101 Valley Life Sciences #4780	Berkeley	CA	94720-4780	Entomological materials	Approved with Conditions	See attached Wildlife Branch SCP Authorizations and Conditions.

Additional Permit Conditions:

All Standard Conditions for Scientific Collecting Permits: **SCP Standard Conditions**

Condition Title	Condition
Please see attached:	Wildlife Branch SCP Authorizations and Conditions (10 pages dated July 20, 2020), List of Authorized Individuals (1 page dated July 20, 2020), Decontamination Protocol for Field Work with Amphibians and Reptiles in Canada (10 pages dated May 2017), Standard Conditions for all SCP Holders (2 pages dated July 1, 2017), COVID-19 Mammals SCP Notice (3 pages dated May 6, 2020), and Rabbit Hemorrhagic Disease (RHDV2) Notice (2 pages dated June 11, 2020).

Permitholder Initials: _____

Specific Use SCP **July 20, 2020**
S-190980001-19111-01

California Department of Fish and Wildlife (Department) - Wildlife Branch **Legacy ID:**
Authorizations and Conditions for Scientific Collecting Permit (SCP) **SC-013377**
ENTITY: Museum of Vertebrate Zoology, University of California, Berkeley
Principal Investigator: Michelle S. Koo
See Attachment #2 for the List of Authorized Individuals

Hirano, Chad@Wildlife
Digitally signed by Hirano, Chad@Wildlife
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This permit was previously issued on March 15, 2016. The terms and conditions (7 pages dated February 29, 2016) set forth in that permit are hereby superseded by this renewal.

Authorizations and conditions based on your online SCP application entitled "Understanding the biodiversity, evolution and ecology of California's Herpetofauna" received by the Department on May 17, 2019, on file with the Nongame Wildlife Program (NWP).

You are authorized to ***take (capture, take non-invasive swabs, sacrifice and release)*** terrestrial and vernal pool invertebrates, amphibians and reptiles ***(excluding Threatened, Endangered, CESA-Candidate*** *and* ***Fully Protected)*** – including all Amphibian and Reptile Species of Special Concern (ARSSC) - in accordance with the conditions below.

Salvage of dead vernal pool invertebrates, reptiles, amphibians, mammals and birds is authorized in accordance with your current federal Migratory Bird permit MB-153526 and the additional conditions below.

Permitted activities are restricted to the following geographic areas in California:

a. Statewide

Other Permits:
You shall obtain and maintain during the term of this SCP any federal permit(s) and/or other state permit(s) required to conduct the activities authorized herein. Although the provisions of the federal permit(s), other state permit(s) and this SCP may vary, the more restrictive conditions prevail. Copies of your federal permit(s) or other research-related permits (e.g., State Parks, landowner access agreements), and any amendments, shall be provided to the Department contacts (see below), and the names of all authorized sub-permittees shall be provided for the permit(s).

You shall carry all required documents, permits and MOUs, along with your SCP, with you while conducting all authorized activities.

Department Contacts:

The primary Department contact for this terrestrial wildlife permit is the Wildlife Branch SCP coordinator (Justin Garcia, Environmental Scientist, Justin.Garcia@wildlife.ca.gov, 916-376-8698).

The Department contact for the reptile and amphibian research is Laura Patterson (Senior Environmental Scientist (Specialist), Laura.Patterson@wildlife.ca.gov, 916-373-6633).

Conditions to Scientific Collecting Permit
S-190980001-19111-01

1. <u>When a Memorandum of Understanding is needed</u>

Intentional take of species listed as Threatened, Endangered, or Candidate under the California Endangered Species Act (CESA), or intentional take of Fully Protected species, is not authorized without a Memorandum of Understanding (MOU) from the Department on which you are specifically named.

You may not capture, handle, or otherwise take the **Foothill yellow-legged frog (*Rana boylii*),** including dip netting for larvae, without a CESA MOU and/or an Incidental Take Permit (FGC Section 2081(b)) on which you are named. Passive visual encounter surveys are authorized if no trapping or handling is involved.

The Foothill yellow-legged frog "Northwest/North Coast Clade" is a California Species of Special Concern and authorized by this SCP, but the other five clades are listed as threatened or endangered under CESA and require authorization via an MOU. To view a map of the clade boundaries, go to https://apps.wildlife.ca.gov/bios/ and search for BIOS layer "**Foothill Yellow-legged Frog Clade Boundaries [ds2865]**".

Intentional take (e.g., capture) of the **Cascades frog (*Rana cascadae*)**, a CESA Candidate species, requires a CESA MOU or letter permit authorization and is not authorized solely by this SCP. Contact Laura Patterson (Laura.Patterson@wildlife.ca.gov) for more information.

After the California Fish and Game Commission makes a final finding, published in the California Regulatory Notice Register, regarding whether the petitioned action to add the Cascades frog to the list of threatened or endangered species under CESA is warranted, the Cascades frog will either be added as a species authorized by this SCP, or a CESA MOU may be required should the species become listed under CESA.

To apply for a State MOU, contact the Department Research MOU Coordinator, Esther Burkett (Esther.Burkett@wildlife.ca.gov), for study proposal requirements.

2. When additional authorization on your SCP is needed

Intentional take of Federally-listed species is not authorized without a valid federal permit **and** additional written authorization from the Department (*e.g.*, Wildlife Authorization #8), on which you are specifically named or otherwise authorized.

Except as authorized above, intentional capture of California Species of Special Concern (amphibians, reptiles, mammals) requires an amendment to your SCP.

Incidentally-captured individuals of non-target wildlife taxa shall be released at the capture site immediately, once identified, without further handling, unless otherwise authorized for activity(ies) on that species or subspecies in this permit.

You can find a list of species and subspecies designated as Threatened, Endangered, Candidate, Fully Protected, Species of Special Concern, or "Taxa to Watch" in the Department's Special Animals List at the following link: http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline=1.

Marking of any species requires special authorization by the Department.

3. Location of Field Activities

Your field activities may be located in a special status natural community or in an area that provides habitat for a non-target special status plant or animal. It is your responsibility to determine whether or not implementation of your field activities could have potential adverse impacts to a listed or special status plant or animal or special status natural community. To minimize potential impacts, compile relevant biological information in the general study area prior to conducting field activities or research. Generally, identify vegetation and habitat types occurring in your study area based on biological and physical properties of the site and

surrounding ecological subregion[1], unless a larger assessment area is appropriate. Conduct a Rarefind or CNDDB Quick Viewer search (https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data) and check with other reliable resources for known occurrences of special status plants, animals, or natural communities at the site before conducting your research. Contact the Wildlife Branch SCP Coordinator (Justin.Garcia@wildlife.ca.gov, 916-376-8698) if non-target special status plant or animal species are likely to be encountered or are being handled or disturbed.

You shall check with the landowner to determine if any other researchers are permitted to conduct activity(ies) in the same site or area. Prior to entering Department lands to conduct the activity(ies) described herein, you shall first receive additional written authorization from the Reserve Manager; see also SCP Standard Condition D.

4. Protocol for Disinfecting Equipment

To reduce the likelihood of disease transmission, you shall employ the "Decontamination Protocol for Field Work with Amphibians and Reptiles in Canada" (10 pages dated May 2017 or most recent revision), using methods that are effective against chytrid fungi, ranaviruses and snake fungal disease. The protocol is available at: http://www.cwhc-rcsf.ca/docs/HHWG%20Decontamination%20Protocol%202017-05-30.pdf.

5. Terrestrial and Vernal Pool Invertebrates

You may sample for terrestrial and vernal pool invertebrates using appropriate methods to avoid incidental injury or mortality to federally-listed species. You may not intentionally survey for federally-listed branchiopods, butterflies, or other insects without being so authorized on a federal recovery permit. Live capture and release is the preferred method for gathering invertebrate data when feasible.

Sacrifice of non-listed terrestrial invertebrates is authorized as needed for identification and when necessary to fill museum collection gaps (e.g. documenting new location or new morphology for a location) at the Essig Museum of Entomology. You or someone present should have the expertise to distinguish listed species or subspecies using field techniques. Sacrifice should be limited to one per species per location unless deemed necessary to distinguish variation not identifiable in the field. Collection of invertebrates may not exceed 10% of a local population.

You may not sacrifice longhorn beetle, flower-loving fly, metalmark butterfly, elfin butterfly, blue butterfly, checkerspot butterfly, skippers, or silverspot butterfly without the expertise to distinguish federally-listed subspecies by use of field methods or by avoiding the specific combination of their habitats and geographic ranges. Lethal traps are not authorized in the range and habitat of threatened or endangered species or subspecies.

Lethal take of invertebrates on the California Terrestrial and Vernal Pool Invertebrates of Conservation Concern (17 pages dated June 2017) list shall be reasonably avoided.

All suitable specimens sacrificed or salvaged, intentionally or incidentally, shall be donated to a public scientific or educational institution in California for research or teaching collections after one month of acquisition (e.g., Essig Museum of Entomology, University of California, Berkeley, CA). You shall make a reasonable effort to coordinate with any other researchers

[1] U.S. Forest Service Ecological Subregions of California: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=86840

who may be collecting the same species in the same locations to avoid impacts to local populations.

6. <u>Reptiles and Amphibians</u>

You shall make a reasonable effort to coordinate with other researchers who may be conducting research on Amphibian and Reptile Species of Special Concern (ARSSC) in the same locations to avoid duplicate work and to avoid impacts to local populations, and to share information on individually-marked individuals and their movements.

a. Capture and Handling

The authorized methods of capture for reptiles and amphibians (excluding turtles) are: hand, dip net, hand net, lizard noose, snake hook and cover boards.

Only hand capture or dipnet is authorized for turtles. Your standard authorization (#2/3) does not authorize live traps (e.g., turtle traps). To set other types of live traps for reptiles and amphibians (e.g., western pond turtles), you shall have explicit authorization via an SCP amendment.

Capture methods shall avoid disturbing native reptile and amphibian eggs and egg masses. Amplexing or mating pairs of native amphibians and reptiles shall not be captured, handled, or disturbed.

Amphibians shall be handled with wet hands that are free of lotions, creams, sunscreen, oils, ointment, insect repellent or any other material that may harm them.

You shall process individuals expediently. Larval amphibians shall not be handled out of the water for longer than 30 seconds unless rewetted, and shall not be retained for longer than five (5) minutes for processing. Adult and juvenile amphibians and reptiles shall be released immediately if they exhibit signs of excessive physiological stress or if handling time exceeds one (1) hour.

All amphibians and reptiles shall be released at the point of capture, unless that location puts them in imminent danger, in which case they shall be placed in a nearby refugium sufficient to protect them.

Any habitat element (e.g., rocks, boulders, and logs) moved to survey for reptiles or amphibians shall be placed back exactly where they were found to avoid negative impacts on habitat conditions

Threatened, Endangered, CESA-candidate, or amphibian and reptile species of special concern (ARSSC) that are incidentally captured shall be immediately released at the site of capture and reported to the California Natural Diversity Database at least annually.

b. Chytrid Fungus Sampling

Chytrid fungus sampling of reptiles and amphibians (***excluding Threatened, Endangered, CESA-Candidate, and Fully Protected species***) is authorized by non-invasive swabbing only. Any other method requires additional justification via a SCP amendment. You shall coordinate with other researchers who may be doing similar work in your area to avoid duplicate handling and to share data. Contact the landowner to determine if other researchers are sampling for chytrid in your study area(s), and report any amphibians positively identified with chytrid to Laura Patterson (Laura.Patterson@wildlife.ca.gov).

c. Incidental Injury or Mortality

You shall report any incidental injury or mortality of a listed, candidate, or fully protected amphibian or reptile, and ARSSC to Laura Patterson (Laura.Patterson@wildlife.ca.gov) within three (3) days, and you shall provide a written report of the incident within ten (10) days via email.

7. <u>Sacrifice of Amphibians and Reptiles</u>

You shall make a reasonable effort to coordinate with any other researchers who may be collecting the same wildlife species in the same locations to avoid impacts to local populations (e.g., California Academy of Sciences; San Diego Nat. His. Museum; UC Berkeley).

a. General Conditions

Lethal take for voucher specimens is authorized when necessary to fill museum collection gaps (*e.g.*, documenting new location or new morphology for a location).

Lethal take for research is authorized when necessary to obtain tissue samples for specific genetic studies, for taxonomic identification not otherwise obtainable by non-lethal methods, or for studies described in your SCP. Lethal take for genetic samples is authorized only when taking live tissue samples is not feasible or sufficient for the study.

Before conducting surveys at new locations, you shall consult GBIF.org, VertNet.org, and the California Natural Diversity Database (if you have a subscription) to determine whether vouchers already exist from the site and how recently they were collected.

Prior to sacrificing the authorized animals, you shall make a reasonable effort to obtain specimens via salvage, donation, rehabilitation centers, or locations imposing imminent death (such as for depredation) or deleterious alteration of habitat.

For purposes of this permit, a "collection site" is defined as one or more sampling localities that occur in the same geographic area and elevational/ecological zone, and/or represent the same breeding population for a given species.

b. Sacrifice Limits

You may sacrifice up to **eight (8)** individuals per species per collection site of non-special status reptiles and amphibians (***excluding Threatened, Endangered, CESA-Candidate, Fully Protected, and ARSSC)*** throughout the term of this permit. You may collect amphibian eggs or larvae, not to exceed 20 eggs or larvae or 10% of the population, whichever is less.

You shall not sacrifice any slender salamanders (*Batrachoseps* spp.) that occur within the range of CESA-listed Desert slender salamander (*B. major aridus*), Kern Canyon slender salamander (*B. simatus*) and/or Tehachapi slender salamander (*B. stebbinsi*).

You may sacrifice up to **one (1)** specimen per Amphibian and Reptile Species of Special Concern (ARSSC) per collection site, or no more than 20% of the local population, whichever is less, only if documenting new localities with voucher specimens, or those localities that have not been documented for over 10 years (except as otherwise noted below). Take of ARSSC for any other reason is prohibited. Take of the authorized ARSSCs shall not exceed a cumulative total of five (5) individuals per species throughout the term of this permit.

You may **not** sacrifice the following ARSSCs, and only photographs shall serve as voucher specimens, unless otherwise authorized in writing by the Department contact (Laura.Patterson@wildlife.ca.gov):

- Arroyo Toad (*Anaxyrus [=Bufo] californicus*), Yosemite Toad (*Anaxyrus [=Bufo] canorus*), California Red-legged Frog (*Rana draytonii*) and Oregon Spotted Frog (*Rana pretiosa*);
- Temblor legless lizard (*Anniella alexanderae*), Southern Sierra legless lizard (*Anniella campi*), Bakersfield legless lizard (*Anniella grinnelli*) and any other legless lizards that occur throughout their ranges;
- Relictual slender salamander (*Batrachoseps relictus*);
- Sonoran Desert toad (*Incilius [=Bufo] alvarius*);
- Southwestern pond turtle (*Actinemys [=Emys] pallida*);
- Cope's leopard lizard (*Gambelia copeii*);
- Gila monster (*Heloderma suspectum*);
- Sonora mud turtle (*Kinosternon sonoriense*);
- Baja California coachwhip (*Coluber [=Masticophis] fuliginosus*);
- Flat-tailed horned lizard (*Phrynosoma mcallii*);
- Lowland leopard frog (*Lithobates [=Rana] yavapaiensis*);
- Common/Coast gartersnake, southern populations (*Thamnophis sirtalis* sp.);
- Sandstone night lizard (*Xantusia gracilis*); and
- Foothill yellow-legged frog and Cascades frog (see Condition #1, above).

Information on detections of the Sonoran Desert toad, Sonoran mud turtle or Lowland leopard frog shall be immediately reported to the Department contact (Laura.Patterson@wildlife.ca.gov) within three (3) working days of their discovery.

Undocumented localities for ARSSCs or other Department "Special Animals" shall be established through the California natural Diversity Database (CNDDB).

Total take shall be spread geographically and across various seasons, over three (3) study years (2020-2023), to the greatest extent possible, to avoid impacts to local populations, and in consideration of environmental factors such as extended drought conditions, take by other researchers, threats to the population(s), and cumulative impacts facing wildlife at the collection site(s). Rare species and subspecies shall receive special consideration in this regard.

c. Other Conditions for Sacrifice of Wildlife

The totals are cumulative and shall not be exceeded by the combined efforts of other researchers associated with this study(ies).

You shall avoid or limit take, to the extent reasonably possible, of animals during their breeding seasons, or you shall take reasonable measures to avoid collection of gravid females and individuals who are actively brooding, feeding young, or defending young.

You shall take reasonable precautions to avoid undue disturbance, harassment, stress, or incidental injury of target and non-target species, or mortality over the authorized take limits.

You shall have the expertise to distinguish target animals from non-target wildlife, especially listed species or subspecies, using field techniques.

All authorized animals intended for sacrifice shall be captured using the methods specified above (See Condition #6 above).

Any captured animals that are marked by other researchers shall not be sacrificed (see Reporting below), and shall be released alive and unharmed at the site of capture.

The authorized species shall be sacrificed using humane euthanasia guidelines (Beaupre et al. 2004, and American Veterinary Medical Association 2013).

The above limits **do not apply** to non-native and invasive reptiles and amphibians, or if collecting in an area where those non-native animals are otherwise being eradicated, or at locations where die-offs are occurring.

8. Salvage of Birds, Mammals, Amphibians and Reptiles

You may salvage birds, mammals, amphibians, and reptiles incidentally killed during permitted activities or encountered dead in the field, as specified below. There is no limit to the number of salvaged wildlife.

Salvaged specimens of CESA-listed, CESA-Candidate, and Fully Protected species require disposition instructions from the Department. Federally-listed species require authorization and disposition instructions from the U.S. Fish and Wildlife Service (Service).

You may not salvage bats (Order Chiroptera) or marine mammals unless additionally authorized. Salvage of mountain lions (*Puma concolor*) or their parts is prohibited by law. Black bears (*Ursus americanus*) may not be salvaged without obtaining additional authorization from the Department's regional law enforcement office and the regional wildlife management supervisor. Salvage of other big game species (i.e., feral pig (*Sus scrofa*), deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), pronghorn antelope (*Antilocapra americana*), and bighorn sheep (*Ovis canadensis*)) is not authorized without obtaining additional written approval from the Big Game Program (contact Justin.Garcia@wildlife.ca.gov).

You may not salvage migratory birds or bird parts, including feathers, without being so authorized by a valid federal Migratory Bird (MB) permit (e.g., Special Purpose - Salvage) from the U.S. Fish and Wildlife Service (http://www.fws.gov/migratorybirds/mbpermits.html) and additional written authorization from the Department (contact Justin.Garcia@wildlife.ca.gov). Copies of these permits shall be provided to the Department, and the names of all authorized subpermittees shall be provided for the MB permit.

This SCP does not authorize you to take bird eggs or nests (including unviable eggs and abandoned nests), without an amendment.

You shall leave specimens that are unsuitable for donation at the site or shall completely destroy them through burial or incineration. You shall obtain additional permission to salvage on private or public property from the landowner or custodian of that property.

9. Disposition and Labeling of Specimens

You shall securely label each salvaged specimen with the following information: (a) date of salvage; (b) location of the specimen (GPS coordinates and datum); (c) species name; (d) unique identification number; (e) name and affiliation of the person who salvaged the specimen; and (f) the permit number(s) and expiration date(s) under which the specimen was salvaged.

You shall deposit all salvaged specimens in a public scientific or educational institution in California within one month of acquisition (e.g., Museum of Vertebrate Zoology, University of California, Berkeley, CA; California Academy of Sciences, San Francisco, CA).

To validate the specimens were collected pursuant to this permit, a copy of the Transfer of Possession – Chain of Custody form (DFW 1379c) shall accompany any salvaged specimems when transferred to another person.

10. Reporting Requirements

Abstracts, reports, and other publications may be submitted to the Wildlife Branch SCP Coordinator (Justin.Garcia@wildlife.ca.gov) and the Department contact(s) noted below, in an electronic format (such as a pdf file), which is the preferred format. ***All required reporting information shall also be uploaded into the SCP Portal (see Section 1b of the online permit).***

If no activities were conducted with any or all species authorized under the SCP during the previous year and/or term of your permit, you shall state this in writing in your annual report and/or MWR form.

Annual Report(s) for the Grinnell Resurvey Project and ARSSC:
You are required to submit an annual report to Laura Patterson (Laura.Patterson@wildlife.ca.gov), in an electronic format, describing the results and significant findings of your research on amphibians and reptiles.

The annual reports shall be submitted on or before **January 31st** of the year following each year of research. The reports shall follow standard scientific format (Title, Date, Author(s) and Affiliation(s), Introduction, Study Area (with map), Methods, Results, Discussion, and Literature Cited). Photographs may be included as needed, or as an Appendix.

The annual report(s) shall include, but not be limited to, the following information for ARSSC captured and/or observed:

a) The dates of field work, site name, and names of all workers;
b) Date observed and captured
c) Number and location of animals observed or handled (GPS coordinates and datum);
d) A map depicting the locations of the survey/research site(s);
e) A map indicating the locations of detections and/or locations where animals were captured and released;
f) Information on individual health, condition, sex, maturity/estimated age, size, and morphometric measurements;
g) Detailed identification information for any captured and/or marked animals (e.g., numbering codes and assignments of scute notches, and a photograph of the carapace/plastron);
h) Habitat description, including photographs of sites where animals were detected and sites where any relocation may have occurred;
i) Estimates of population size, distribution, and relative density, if feasible;
j) Any information regarding movements and habitat use;
k) A description of the number, causes, and location of any incidental injuries or mortalities;
l) The date and location of reposition of each salvable or injured specimen; and
m) Other information important for conservation of the authorized ARSSC, along with a description of known threats to the species and any management recommendations.

Mandatory Wildlife Report (MWR) Form:
You shall report all take of wildlife, including incidental take (e.g., capture) of non-target species, on the MWR form within 30 days of expiration of the permit. In cases where large quantities of incidental capture cannot be avoided, such as with dip nets, you may estimate numbers to the best of your ability, or use a general description of the quantity.

When you submit the MWR form, please reference your annual scientific reports for the Grinnell Resurvey research described above and any CNDDB data that have been submitted to the Department. There is no need to repeat the more detailed information contained in your CNDDB forms on the MWR form.

Other Reports:
For activities associated with this SCP, you shall also provide copies of abstracts you may prepare for any papers you present, or copies of any papers you prepare for popular articles or scientific journals, or copies of any periodic, annual, or final report that you prepare or assist in preparing for a client or other third party.

California Natural Diversity Database (CNDDB):
For any Threatened, Endangered, Candidate, Fully Protected, Species of Special Concern or Taxa to Watch encountered and correctly identified (see the Department Special Animals list found here: https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals), you shall send occurrence data to the CNDDB. You shall submit point data to the CNDDB at least annually. You shall submit data using CNDDB's Online Field Survey Form, which can be accessed here: https://www.wildlife.ca.gov/Data/CNDDB. If you cannot access the Online Field Survey Form or receive permission from the primary Department contact, data may also be submitted on the standard CNDDB Field Survey Forms (https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=25739&inline=1), or in an electronic spreadsheet with an attached map depicting locations of observations (see https://www.wildlife.ca.gov/Data/CNDDB/Submitting-Data). Include known threats to the species in your submittal. A cross reference to your annual report(s) shall also be included.

11. Regional Office Notification and Report Circulation

In addition to the regional office notification requirement in Standard Condition F, you shall send notification to the regional biologists listed below for field activity(ies) in the county(ies) below. You should have a specific survey or study before conducting any activities authorized by this SCP, and notify the regional contact prior to the start of each new survey and/or study. Submit electronic copies of any reports produced or required by this permit, within two weeks of completion, to the contact listed below, as appropriate for the counties of your activities.

For reptiles and amphibians only:
Mendocino, Humboldt, Del Norte
Michael Van Hattem, Michael.VanHattem@wildlife.ca.gov, 707-445-5368
Department Central Region (4)
Craig Bailey, Craig.Bailey@wildlife.ca.gov, 559-243-4014 x 227
Imperial, Riverside, San Bernardino
Marissa Caringella, Marissa.Caringella@wildlife.ca.gov, 909-980-1381
Santa Barbara, San Diego, Orange, Los Angeles, Ventura
Tim E. Hovey, Tim.Hovey@wildlife.ca.gov, 661-297-8920

For Cascades Frog:
Justin Garwood, Justin.Garwood@wildlife.ca.gov, 707-825-4723

Napa, Sonoma
Stacy Martinelli, Stacy.Martinelli@wildlife.ca.gov, 707-576-2868

Solano (Suisun Marsh)
Laureen Thompson, Laureen.Thompson@wildlife.ca.gov, 209-234-3676

Alameda, Marin, Contra Costa
John Krause, John.Krause@wildlife.ca.gov, 415-454-8050

Alameda, San Francisco
Marcia Grefsrud, Marcia.Grefsrud@wildlife.ca.gov, 707-644-2812

When working on Department lands and/or with special status species:
San Francisco, San Mateo, Santa Cruz, Santa Clara
Terris Kasteen, Terris.Kasteen@wildlife.ca.gov, 408-365-1066

San Bernardino, Riverside, Imperial, Inyo, Mono
Steve Parmenter, Steve.Parmenter@wildlife.ca.gov, 760-872-1123
Lacey Greene, Lacey.Greene@wildlife.ca.gov, 760-872-1128

12. Standard Provisions

The attached provisions shall also be followed: Standard Conditions for All Scientific Collecting Permits (2 pages dated July 01, 2017).

13. List of Authorized Individuals

All personnel independently conducting activity(ies) for your study(ies) shall carry a copy of this SCP and be named on your SCP List of Authorized Individuals (LAI; Attachment #2).

The Principal Investigator may request to change or add Authorized Individuals to be named on the LAI by submitting an SCP amendment application with the following information: a) name of the individual; b) species the individual will be working with; c) activities the individual will conduct; d) whether or not these activities will be conducted independently or under direct supervision (within three meters); and e) resumes/CVs and statements of qualifications that describe the individual's experience with the species, and experience with the methods to be employed in the study(ies). Letters of recommendation may also be required as supplemental information.

14. Term

This Entity SCP shall be in your possession while conducting the activities described above, and is valid for three years from the date of issuance.

You may use the SCP amendment form for any modifications to your research in the future (https://www.wildlife.ca.gov/Licensing/Scientific-Collecting).

Minor deviation from the stipulated terms and conditions may be authorized on a case-by-case basis when approved by the Department contact unless an amendment to this permit would be required.

Should you have any questions, please contact Justin Garcia (Justin.Garcia@wildlife.ca.gov).

Literature Cited:

American Veterinary Medical Association (AVMA). 2013. AVMA Guidelines for the Euthanasia of Animals: 2013 Edition. https://www.avma.org/KB/Policies/Documents/euthanasia.pdf.

Beaupre, J., E.R. Jacobson, H.B. Lillywhite, and K. Zamudio. 2004. Guidelines for use of live amphibians and reptiles in field and laboratory research. Second Edition. Revised by the Herpetological Animal Care and Use Committee (HACC) of the American Society of Ichthyologists and Herpetologists. http://www.asih.org/sites/default/files/documents/resources/guidelinesherpsresearch2004.pdf

State of California - Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Wildlife Branch
Nongame Wildlife Program
1010 Riverside Parkway
Sacramento, CA 95605
http://www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Expiration Date: see SCP

Attachment 2
LIST OF AUTHORIZED INDIVIDUALS

Museum of Vertebrate Zoology (EID-190980001)
Michelle S. Koo (SC-190810006)
Principal Investigator

Hirano, Chad@Wildlife
Digitally signed by Hirano, Chad@Wildlife
DN: DC=Gov, DC=Ca, DC=Dfg, DC=AD, OU=DFG Divisions, OU=WFD, OU=Users, CN=" Hirano, Chad@Wildlife"
Reason: I am the author of this document
Location: your signing location here
Date: 2020-07-20 12:02:00
Foxit PhantomPDF Version: 9.6.0

July 20, 2020

1. Individuals authorized to conduct scientific research activities as specified below pursuant to this Wildlife Branch Entity Scientific Collecting Permit (SCP):

   Principal Investigator:

   Michelle S. Koo

   Authorized Individuals:

   David B. Wake, Carol L. Spencer, Jimmy A. McGuire, Rebecca Tarvin, Robert W. Hansen, Ammon Corl and Vance T. Vredenburg

2. The Principal Investigator is authorized to independently conduct all wildlife research activities pursuant to this permit, and shall have adequate supervision over all individuals named on this list. The Principal Investigator is responsible for all reporting requirements.

3. The Authorized Individual(s) listed above may conduct activities pursuant to this SCP without the direct supervision of the Principal Investigator, and as authorized by the appropriate federal permit(s), when applicable.

4. Field Assistants shall work under the direct, on-site supervision, *i.e.*, within 3 meters, of the Principal Investigator or an Authorized Individual and may assist on research efforts, until such time as the Principal Investigator can certify in writing to the Department, and the Department responds favorably, that the individual may work independently.

5. A SCP amendment form shall be submitted, approved, and returned to you by the Department before you can add or remove personnel from this list. A request to elevate a Field Assistant(s) to Authorized Individual(s) does not require a formal amendment form and fee.

6. This list, the Entity SCP and any amendments shall be in the possession of all individuals independently conducting work in the field.

STANDARD CONDITIONS FOR ALL SCIENTIFIC COLLECTING PERMITS

Pursuant to California Fish and Game Code (FGC) Sections 1002, 1002.5 and 1003, and Title 14 California Code of Regulations (CCR), Section 650, the Permitholder is authorized to take and/or possess wildlife according to the authorizations, conditions and restrictions listed on the Scientific Collecting Permit (SCP or permit) issued by the California Department of Fish and Wildlife (Department). These Standard Conditions apply to all General and Specific Use level permits for all Permitholders, Authorized Individuals[1], and any unnamed Field Assistants conducting activities under a SCP. The Department may revoke, suspend, or unilaterally amend or modify, or deny a permit for failure to comply with the authorizations, conditions or restrictions of the permit, or for other reasons listed in Title 14 CCR, subsection 650(s).

A. Possession of Identification. Authorized Individuals named or covered on the List of Authorized Individuals shall carry in their possession a valid, government-issued photo identification card at all times when conducting any activity authorized by an SCP pursuant to Title 14 CCR, subsection 650(a)(2).

B. Permit Documents. All Authorized Individuals shall carry in their possession a copy of the SCP, and all other required permit documents, pursuant to Title 14 CCR, subsection 650(a)(3).

C. Take and Possession Limits/ Allowances. Permitholders shall always ensure strict compliance with limits and allowances granted by the permit. The limits described in the permit apply to the entire permit and are shared cumulative across the Permitholder and all Authorized Individuals.

D. Department Lands. Prior to entering the following types of Department lands, or other managed areas, to conduct any permitted activities, the Permitholder shall first receive written authorization from the Regional Manager or their designee for the particular area, unless otherwise specifically conditioned in your SCP: Wildlife Area, Ecological Reserve (Title 14, Section 630 CCR, subsection 550(a)(4), and subsection 550(f)), Marine Managed Areas, and Marine Protected Areas (MPAs) (Title 14, CCR Section 632, and Public Resources Code 36602) (i.e., State Marine Reserve, State Marine Conservation Area, State Marine Park, State Marine Recreational Management Area), State Reserve, Marine Life Refuge (FGC Section 10500), Fish Refuge, Rockfish Conservation Area, or Cowcod Conservation Area (Title 14, Section 27.20 through 29.85, CCR).

E. Landowner Permission. The Permitholder is responsible for obtaining permission from the owners and managers of all properties, whether public or private, prior to entering to conduct the activities authorized by the permit. It is the responsibility of the Permitholder to know the boundaries and managing authority of designated protected areas (e.g., State Parks, National Wildlife Refuges, National Parks, National Marine Sanctuaries, etc.).

F. Notification of Field Work or Activity. The Student Permitholder, and the PI, or any Authorized Individual on an Entity and Individual permit, shall notify the Department at least 36 hours, but not more than 14 calendar days~~,~~ prior to conducting permitted take and/or possession activity(ies) in the field, unless otherwise specified in the conditions of the permit. Additional requirements pursuant to Title 14 CCR, subsection 650(o) apply. The Permitholder shall complete all fields on the Notification of Field Work or Activity form (DFW 1379b) and electronically send the form to Law Enforcement Division contacts, Regional office(s), Regional Biologists, or other contacts, as specified in the permit conditions.

G. Reporting Requirements. Permitholders shall carry the Mandatory Wildlife Report (MWR) form DFW 1379a, or required information fields, in a paper or electronic format while conducting activities pursuant to the permit, and shall record the information during, or upon completion of, each collecting event. Permitholders are required to submit the MWR form within 30 days following the expiration of the permit, or sooner if submitting an application to renew an SCP, whichever comes first, or as required by the Authorizations or conditions in the permit. The MWR is mandatory even if no wildlife was taken or possessed see form DFW 1379a instructions for specifics on how to complete the form).

H. California Endangered Species Act and Fully Protected Species. No person shall intentionally take or possess any State-Threatened and or Endangered, or State-designated Candidate wildlife under the California Endangered Species Act, or any Fully Protected species, without a valid Memorandum of Understanding (MOU), permit, or other written authorization from the Department pursuant to Fish and Game Code Section 2050 *et seq*., Title 14 CCR, subsections 670.7 and/or 786.9. If any Threatened, Endangered, Rare, or Candidate, or Fully Protected species are

[1]"Authorized Individual" means the Permitholder, the Principal Investigator, or any other person approved by the Department to independently conduct any permitted activity(ies) authorized by the permit, and who is named or covered on the permit's List of Authorized Individuals (LAI) (Title 14, CCR subsection 650(b)(2)).

taken inadvertently or incidentally (e.g., by-catch) as a result of activities authorized by an SCP, then any such wildlife shall be immediately released alive and unharmed at the site of capture without further handling, unless otherwise authorized by the Department. You shall follow additional Department notification and reporting requirements for any incidental capture, injuries and mortalities of these species, as outlined in your SCP conditions, and you may be required to temporarily cease field activities and obtain a MOU.

I. California Natural Diversity Database (CNDDB). Data collected during SCP activities for species on the Special Animals and the Special Plants, Bryophytes and Lichens lists (https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals) should be submitted directly to the CNDDB. Data may include field observations of wildlife listed as Threatened, Endangered, or Candidate under the California Endangered Species Act, Fully Protected species, California Species of Special Concern, or other special animals and plants. Please see the CNDDB webpage for information on appropriate submission methods (https://www.wildlife.ca.gov/Data/CNDDB). The preferred method of data submission for individual observations is the CNDDB Online Field Survey Form. The CNDDB accepts data in a range of other formats- see submission guidelines for alternatives and guidance for larger digital datasets.

J. Fishing, Hunting, and Falconry. Sport or commercial fishing, hunting, falconry, trapping, and/or take activities authorized by another Department permit shall not occur on the same trips or time periods as scientific activities, unless otherwise authorized by this SCP.

K. Commercial or Personal Use. The commercial sales, trade, or barter of wildlife taken under a SCP is prohibited, pursuant to Title 14 CCR, subsection 650(a)(5). Personal or human consumption of wildlife taken under an SCP is prohibited, unless specifically allowed by conditions of the permit.

L. Other Laws and Permits. The SCP does not relieve the Permitholder or any Authorized Individual of the responsibility to comply with any other federal, tribal, state, or local law or regulation. The SCP does not relieve the Permitholder or any Authorized Individual of the responsibility to obtain any other tribal, federal, tribal, state, or local permits that may be required. This SCP is invalid unless accompanied by any other required permits for the authorized activities.

M. Labeling of Vessels, Vehicles, and Capture Equipment. All traps, nets, and other capture or research equipment shall be marked with a tag or label that legibly shows the Permitholder's Identification Number (SC-ID) and/or other permit ID, as well as the word "Research," or as otherwise outlined in permit conditions, before placing the equipment in the field. Labeling of vessels is mandatory for MPAs, and labeling of other vessels, vehicles, or aircraft may be required at the Department's discretion, as outlined in your permit conditions.

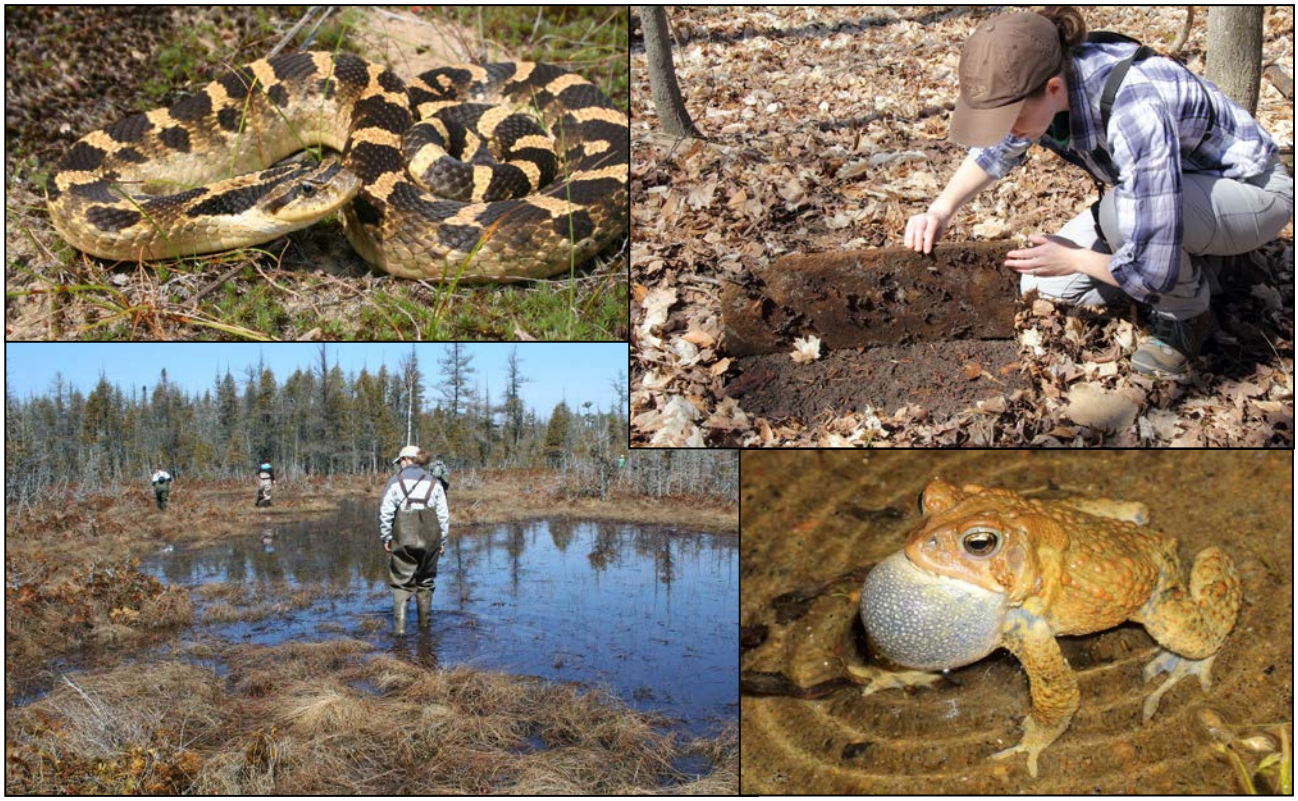
N. Transfer of Possession. Persons or entities receiving accidentally killed or legally acquired dead wildlife and/or parts thereof possessed pursuant to Title 14 CCR, Section 650 may be named as recipients of those wildlife on the permit itself. A completed Chain of Custody form (DFW 1379c) documenting the transfer(s) of live or dead wildlife and/or parts thereof shall accompany wildlife at all times, including during transport. Live wildlife may only be possessed with a valid permit issued by the Department. Subsequent transfers of such dead wildlife and/or parts thereof to another recipient shall also be documented and accompanied by form DFW 1379c. Reporting of such transfers via DFW 1379c shall occur as specified in the original Permitholder's permit conditions as the donor, as required form DFW 1379c for reporting by a subsequent recipient acting as a donor, or as otherwise stated by Title 14 CCR, subsection 650(p).

O. Release of Wildlife. Unless otherwise authorized by the Department, all captured wildlife shall be immediately released at or near the site of capture after the permitted activity. Any wildlife authorized to be removed from the wild shall not be returned to the wild without prior written permission from the Department.

P. Compliance Inspection. At the discretion of the Department, a Department wildlife officer or other Department employee may accompany persons during any permitted activity(ies) authorized by this SCP. The Permitholder shall, at all reasonable hours, allow a Department representative to enter and inspect the designated storage facility(s) and premises where live, or dead wildlife, and/or parts thereof are stored, and shall allow such Department representative to inspect reports and/or records, and the wildlife in possession.

Decontamination Protocol for Field Work with Amphibians and Reptiles in Canada

May 2017



Produced by the Canadian Herpetofauna Health Working Group

Ontario

Québec

British Columbia

Canadian Wildlife Health Cooperative

Cornell University

Keyano College

ASG IUCN SSC Amphibian Specialist Group

Canadian Herpetological Society
Société d'Herpétologie du Canada

Environment and Climate Change Canada
Environnement et Changement climatique Canada

Acknowledgements

The first draft of this protocol was developed by Leif Einarson and the final version was prepared by Joe Crowley, with assistance from Maria Forzan and Kristiina Ovaska. Many of the recommendations in this protocol were informed by the 2008 British Columbia Ministry of Environment document *Hygiene Protocols for field Staff working in aquatic environments*. Photographs were provided by Joe Crowley.

Suggested Citation:

Canadian Herpetofauna Health Working Group. 2017. Decontamination Protocol for Field Work with Amphibians and Reptiles in Canada. 7 pp + ii.

Canadian Herpetofauna Health Working Group membership

Joe Crowley	Ontario Ministry of Natural Resources and Forestry, Government of Ontario; Canadian Herpetological Society
Yohann Dubois	Direction de la biodiversité et des maladies de la faune Ministère des Forêts, de la Faune et des Parcs, secteur Faune et Parcs; Canadian Herpetological Society
Maria Forzan	Cornell University; Canadian Wildlife Health Cooperative
Scott Gillingwater	Upper Thames River Conservation Authority; Canadian Herpetological Society
Purnima Govindarajulu	Government of British Columbia
Lesley Howes	Canadian Wildlife Service, Environment and Climate Change Canada
Sam Iverson	Canadian Wildlife Service, Environment and Climate Change Canada
Kristiina Ovaska	Biolinx Environmental Research Ltd.; IUCN Amphibian Specialist Group - Canada
Bruce Pauli	Pesticides Evaluation, Science and Technology Branch, Environment and Climate Change Canada
Danna Schock	Keyano College
Lenny Shirose	University of Guelph; Canadian Wildlife Health Cooperative
Craig Stephen	Canadian Wildlife Health Cooperative

Emerging amphibian and reptile disease in Canada

Over the past few decades, emerging infectious diseases have caused population declines and extinctions of amphibian and reptile species worldwide. Pathogens that pose a potential threat to Canadian amphibian and reptile populations include:

Chytrid Disease

Caused by the fungus *Batrachochytrium dendrobatidis* (*Bd*), this disease has driven the decline or complete extinction of over 200 species, mainly frogs, worldwide. The fungus has been detected throughout much of Canada, although disease outbreaks are not known to be common.

Salamander Chytrid Disease

Caused by the fungus *Batrachochytrium salamandrivorans* (*Bsal*), this disease recently spread from Asia to Europe where it caused over 96% mortality in wild populations of Fire Salamander. *Bsal* has not yet been reported in North America, but the potential for introduction through global trade poses a significant risk to our native species.

Ranaviruses

These viruses have caused declines in many populations of amphibians, reptiles, and fish worldwide. Ranavirus infections can cause 90-100% mortality in populations and can affect multiple species at the same time. Ranaviruses have been responsible for disease outbreaks in many areas across Canada.

Snake Fungal Disease (SFD)

Caused by the fungus *Ophidiomyces ophiodiicola*, this disease can lead to severe illness and death in snakes. It has been detected in wild snakes throughout northeastern North America, including several locations in southern Ontario.

Purpose

This protocol provides guidance that will help prevent the spread of wildlife pathogens and assist in maintaining healthy amphibian and reptile populations in Canada. This document outlines a general approach to decontamination that is effective against the amphibian and reptile pathogens discussed above, as well as most other pathogens that may affect these species. This protocol is based on the best available scientific information and will be updated as new information becomes available. It is designed to be applied flexibly depending on particular field conditions.

Why decontaminate?

Field research activities can negatively affect wild reptile and amphibian populations through the accidental spread of pathogens. Proper decontamination of boots, waders, nets, boats, and other field equipment helps keep wildlife populations healthy by ensuring that pathogens are not transported between sites. Specialized equipment like calipers or spring scales can also transmit pathogens from site to site or from one individual to another at the same site. Find out more about wildlife disease prevention and monitoring at www.cwhc-rcsf.ca

When to decontaminate

Equipment should always be disinfected between sites, particularly when working with critically endangered populations or at a location with an ongoing mortality event. The definition of a **site** may vary with the scale of the project, the geography of the area, and the ecological communities.

In aquatic environments, the following are considered separate sites:

- Wetlands, ponds, lakes, or other water bodies that are separated by terrestrial areas
- Each tributary of a river or stream
- Each upstream location within a river or stream; it is not necessary to decontaminate between each location when work in rivers or streams follows a downstream direction.

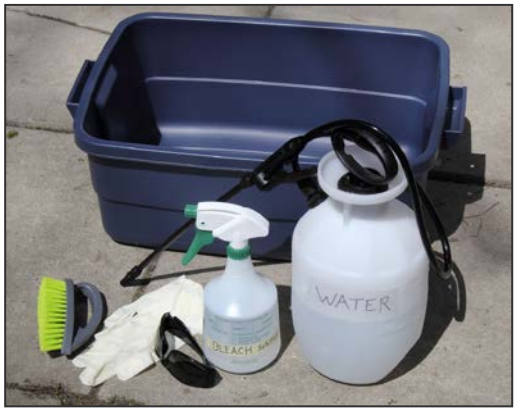
In terrestrial environments, the following are considered separate sites:

- Areas that are divided by major geographical barriers (e.g. lakes or large rivers, cliffs, major highways)
- Areas that are separated by more than 1 km of unsuitable habitat (e.g. agricultural land, urban settlements) or 3 km of suitable habitat (e.g. naturally occurring habitats that are permeable to movement by amphibian or reptile species). These distances are based on NatureServe minimum separation distances.

Within a site, it is recommended that gloves and other equipment (e.g. measurement tools) be changed or disinfected between handling individual animals, unless those animals have already been in close contact with each other (e.g. in the same pitfall trap). If gloves are not being worn, hands should be washed and disinfected between individuals (note: gloves should always be worn when handling amphibians to protect their sensitive skin from chemicals, oil and sweat on your hands).

Materials

- Commercial household bleach: example, Clorox® Bleach (active ingredient 4-6% sodium hypochlorite)
- Biodegradable soap
- Large bucket or tote that will hold about 25 litres (Rubbermaid totes work well)
- Bucket or container with water-tight lid
- Container with tap water
- Spray bottles
- Scrub brushes
- Dishwashing gloves and safety glasses



Why use bleach for decontamination?

This decontamination protocol recommends bleach as a disinfectant for several reasons:

1) Studies have shown that immersion in a relatively dilute bleach solution is sufficient to neutralize *Bd*, Ranaviruses and SFD (see the table at the end of this document for more detail). Information regarding the effectiveness of disinfectants for neutralizing *Bsal* has

not yet been published. However, bleach is likely effective against *Bsal* at similar concentrations used for *Bd* and other amphibian and reptile pathogens.

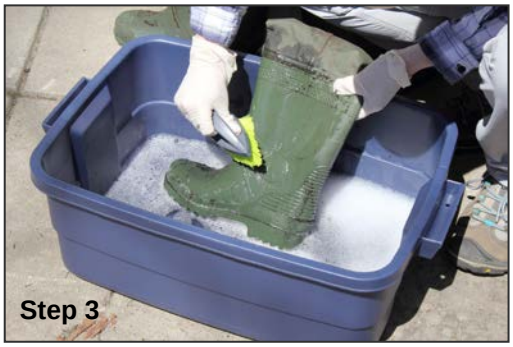
2) Bleach is readily available.

3) Bleach breaks down relatively quickly and poses a lower risk to the environment than some other disinfectants.

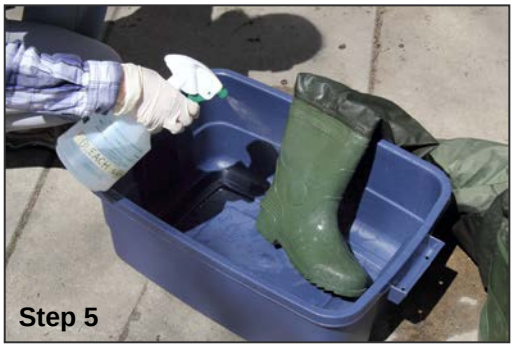
Steps for decontamination

1) Before you travel to your research site, ensure all your equipment has been decontaminated.

2) When you first arrive at the research site, identify a sunny location away from surface water (ponds, streams, ditches, etc.) that has an asphalt or hard-packed surface (e.g. a parking lot). This location will be your decontamination area after you finish your work. The direct sunlight will help break down the bleach before it can enter surface waters.


Step 3

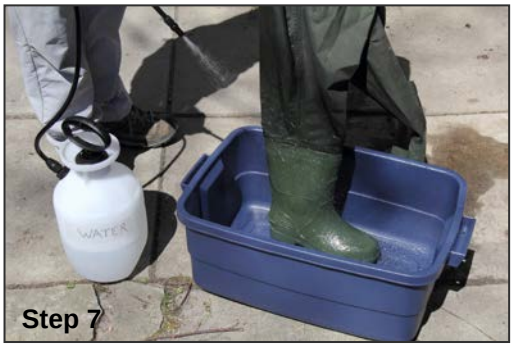
3) After you complete your work, return to your decontamination area and clean all equipment with tap water (do not rise with water from a local pond, lake, etc.), using a scrub brush to remove organic material (mud or vegetation) from your boots and other equipment. If done for the day, thoroughly wash equipment with soapy water and rinse with clean tap water.


Step 5

4) Put on safety glasses and make your decontamination solution in a large bucket / tote by adding 1 part bleach to 19 parts water (e.g. add approximately 1 litre of bleach to 19 litres of tap water or, for smaller batches, 50 ml of bleach to 950 ml of water).

5) Immerse equipment (including scrub brushes) in the bleach solution. Use a spray bottle to soak larger items thoroughly. Soak equipment for five minutes.

6) For sensitive equipment like calipers, cameras, electronic scales, etc., rinse or wipe with 70% ethanol.



Step 7

7) Rinse the bleached items with clean tap water to prevent exposing the next site to residual bleach and to minimize damage to the equipment. If clean tap water is not available, rinse the bleached items with water from the next site (away from aquatic habitats). Do not rinse with water from the current site. If you are done for the day, allow the equipment to dry completely.

8) Whenever possible, remove the bleach solution and soapy water from the site using a bucket with a water-tight lid and dispose of them appropriately. Otherwise, dispose of them at the decontamination site (note: these solutions should not be disposed of in the field if it is raining or if a suitable decontamination area is not available). Ensure full compliance with local laws and safe disposal regulations

9) Once home, wash clothing in hot water.

Additional considerations

1) As an alternative to decontaminating all equipment between sites, pack separate sets of equipment (e.g. bags or containers for animals, marking and measuring tools) for each site. Clean equipment after use and seal it in a plastic bag until it can be decontaminated.

2) It may not be possible or safe to decontaminate with bleach at some sites. In these situations, rinse and /or wash your equipment, seal it in a garbage bag and decontaminate off-site.

3) Some hiking boots or shoes are difficult to decontaminate thoroughly, but full immersion in bleach solution does work. Selecting footwear that is easy to clean (i.e. rubber boots) will help to keep the decontamination process effective.

4) When working at sites where there have been disease outbreaks or sites with critically endangered populations, have dedicated field equipment that will only be used at that site.

5) See the California Centre for Amphibian Disease Control's protocol for additional tips on how to make decontamination more portable:
http://www.ccadc.us/docs/DeconForProfessionals.pdf

6) Powdered bleach and other concentrated disinfectants can be highly toxic to the environment and to humans; it is recommended that these disinfectants be avoided.

Considerations when using Bleach

1) See manufacturer's recommendations and Material Safety Data Sheet requirements for safe handling and disposal.

2) Bleach contains the active ingredient sodium hypochlorite. The concentration of sodium hypochlorite in commercially available bleach varies among brands but is usually close to 6%. Check the concentration and adjust the ratio of your solution if necessary. For quick calculations, use an online calculator like this one:
https://www.publichealthontario.ca/en/ServicesAndTools/Tools/Pages/Dilution-Calculator.aspx

3) Bleach can be fatal to amphibians and reptiles, and amphibians are particularly sensitive. Ensure that bleach is kept away from these animals and their habitats.

4) Bleach is deactivated by prolonged exposure to organic material, air, water, and direct sunlight. Once a store-bought container of bleach is opened, it may only remain effective for 1 month. Once mixed, a bleach solution should be used within 5 days to ensure efficacy. Ideally, store bleach and solutions in a sealed, opaque, container. Solutions should be mixed and used fresh to ensure that they will be effective.

5) If it is raining, disposing of the decontamination solution on site may result in active bleach entering surface waters. In situations like this, it is preferable to soap and rinse on site, and seal up equipment into bags for decontamination with bleach off-site.

Considerations when using Ethanol

1) See manufacturer's recommendations and Material Safety Data Sheet requirements for safe handling and disposal.
2) Undiluted ethanol (70% concentration of ethyl alcohol) has been proven to be effective at removing some pathogens with exposures of 20 seconds to 2 minutes.
3) Ethanol may be fatal to humans if swallowed or inhaled. Repeated or prolonged exposure can damage liver, kidneys and nervous system or cause eye irritation or dermatitis. Ethanol may be absorbed through the skin.
4) Ethanol can harm amphibians by destroying mucus and wax, resulting in dehydration and microbial infection.
5) Ethanol may damage rubber and plastics, and may deteriorate glues.

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Appendix 1: Tested efficiency of decontamination products

Product (% active ingredient)	**Tested concentration**	**Exposure time (min)**	**Effective against**	**Notes**	**Source* (see references)**
Bleach (6% Sodium Hypochlorite)	1:32 (0.2% Sodium Hypochlorite)	1-10	*Bd* RV SFD	Vapor may cause severe irritation or damage to eyes and skin; harmful if swallowed. Fatal to amphibians at high concentrations. Corrodes metals; fades colours and breaks down cloth fibers.	1, 5, 9, 13
70% Ethanol	70% ethyl alcohol	2	*Bd* RV SFD	May be fatal if swallowed or inhaled; can damage liver, kidneys and nervous system by repeated or prolonged exposure; may be absorbed through skin; repeated or prolonged contact can cause eye irritation or dermatitis. May harm amphibians by damaging epidermal coating. May damage rubber and plastics; may cause deterioration of glues.	1, 5, 9, 13
Benzalkonium chloride	1mg/ml	10	*Bd* RV SFD	Requires extreme care in handling (see M.S.D.S.). Very toxic to aquatic organisms. Essential to ensure this chemical does **not** enter the environment.	5, 13, 15
Virkon S® (20.4% Potassium peroxymonosulfate)	1mg/ml	1	*Bd* RV	Not tested against SFD. Harmful if swallowed; irritating to respiratory system and skin; may cause serious eye damage. Non-toxic to amphibians. Safe for fabric; may cause pitting on galvanized or soft metal if not rinsed with water.	1, 5, 8, 9, 15, 18
Nolvasan® (2% Chlorohexidine)	1:127	1	RV	Not effective against SFD. May be fatal if inhaled; causes irreversible eye damage; harmful if swallowed. Safe for amphibians for short durations. No reported effects on equipment.	1, 9, 13
Lysol® Power Bathroom Cleaner	100%	10	SFD	Not tested against *Bd*, RV.	13
Lysol® All Purpose Cleaner	100%	10	SFD	Not tested against *Bd*, RV.	13
NPD®	100%	10	SFD	Not tested against *Bd*, RV.	13
CLR® Bath & Kitchen Cleaner	100%	10	SFD	Not tested against *Bd*, RV.	13
409®	100%	10	SFD	Not tested against *Bd*, RV.	13
Didecyl dimethyl ammonium chloride	2ml/L	1	*Bd* RV	Not tested against SFD.	5, 15, 18
Quaternary ammonium compound 128	Full strength to $1X10^{-3}$	5	*Bd* RV	Not tested against SFD.	5, 8
F10® Super Concentrate Disinfectant	0.7 ml/litre	1	*Bd* RV	Not tested against SFD.	5, 18
TriGene® Virucidal Surface Disinfectant Cleaner	0.2 ml/L	1	*Bd* RV	Not tested against SFD.	5, 18
10% sodium chloride	10%	5	*Bd* RV	Not tested against SFD.	5, 8
2% potassium permanganate	2%	10	*Bd* RV	Not tested against SFD.	5, 8
Sterilizing UV light	1000 mW m^{-2} wavelength 254nm	1	RV	Not effective against *Bd.* Not tested against SFD.	5, 8, 15

Hot wash for cloth bags and clothing	≥60ºC	15	*Bd* RV	Not tested against SFD.	5, 15
Heat	≥60ºC	30	*Bd* RV	Not tested against SFD.	5, 15, 18
Complete drying (footwear only)		3 hours or more	*Bd*	Not effective against RV. Not tested against SFD.	5, 15

*Includes documents that recommend and/or experimentally test decontamination efficacy.

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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

May 6, 2020

Notice of Changes to Scientific Collecting Permit (SCP) and Memorandum of Understanding (MOU) Authorizations, and Handling Precautions for Bats and other Mammals

You are receiving this letter because you currently possess an active Scientific Collecting Permit (SCP) and/or Memorandum of Understanding (MOU), for work with mammals in California. The emergence of COVID-19, the disease caused by the SARS-CoV-2 virus, is a human health crisis of unusual proportions with the potential to directly impact California's wildlife. By all reports to date, COVID-19 is a human-to-human pandemic, with no evidence of wildlife playing a continued role in the spread or transmission of this disease beyond the initial spillover. Experts agree that this novel coronavirus likely originated in bats and preliminary research into this virus raises concern that other mammals could be susceptible. However, additional work is needed and the potential risks SARS-CoV-2 may pose to wildlife remains largely unknown. A multi-agency, State and Federal task force has recently convened to assess these risks, with an emphasis on risk posed to North American bats. Isolated human-to-animal cases of SARS-CoV-2 in domestic and captive wild felid and mustelids, suggest these taxa may be more susceptible. In the meantime, the Department is taking a proactive precautionary approach to working with and handling wildlife that could be at risk of human-to-animal viral transmission (reverse zoonosis).

Until better information is available concerning the risk of reverse zoonosis of the SARS-CoV-2 virus from humans to wild mammals, **the Department of Fish and Wildlife (CDFW) is temporarily suspending authorizations for hands-on work with bats and requiring additional precautions for hands-on work with other mammals**. This action is taken under the authority of Title 14, California Code of Regulations, section 650(s)(2)(D), wherein CDFW may suspend, revoke, or modify any permit if, in CDFW's assessment, wildlife is vulnerable from permitted activities. The changes below are organized by taxonomic group for clarity:

Bats

The following activities are suspended and shall not be conducted until further notice: capture of live bats by mist- or hand-net, harp traps, and by hand, measurements, tissue sampling, and banding and other marking.

This temporary postponement of permit authorizations does not apply to work that does not involve handling. Studies involving ultrasonic recordings of bats at detector stations and emergence counts conducted at a distance from roost sites may be conducted, however we recommend that surveys and other work in confined spaces, such as in

cavernous roosts in caves, mines, and building spaces, also be postponed until further guidance from the State and federal task force risk assessment becomes available.

Additional Precautions Required for Handling Other Live Wild Mammals:

Monitor yourself for symptoms (i.e., fever, cough, shortness of breath), follow public health guidance on quarantine duration following any possible exposures to COVID-19, or a COVID-19 positive test, and stay at home if you are sick.

1) For Carnivores: Wear an appropriate face covering (ex. woven cotton or surgical mask, plastic face shield, cotton bandana or neck gaiter that covers the nose and mouth) when near a captured animal or other person to prevent respiratory droplets from being transferred. Face coverings should be laundered daily or after each use. N95 masks should be reserved for healthcare providers and first responders.

2) Practice good hand-washing hygiene.

3) Work outdoors or in a well-ventilated area whenever possible.

4) Wear dedicated clothing, and gloves when handling captured animals. Consider eye protection.

5) Thoroughly clean any reusable supplies that contact animals with soap and water followed by disinfection whenever possible with 70% isopropyl alcohol, 10% solution of chlorine bleach or Lysol.

6) Perform a risk assessment of all job duties and evaluate the need for additional precautions or personal protective equipment (PPE) for other identified risks based on the situation and species you are working with.

CDFW's modification of permit conditions does not apply to work that does not involve handling. For example, studies involving trail camera monitoring, tracking from a distance, radio/satellite telemetry tracking, visual observations from a distance, and non-invasive scat/hair collection may be conducted. That said, all state and local public health guidance also applies while conducting these activities.

Finally, we ask that mammal SCP/MOU holders report any unusual or unexpected mortalities of study animals to Dr. Deana Clifford (deana.clifford@wildlife.ca.gov). The Department's Wildlife Investigations Laboratory may be able to facilitate postmortem examination of certain cases.

CDFW understands postponement or modification of planned capture work is disruptive to project schedules. We are committed to revising this directive if and as soon as additional scientific information becomes available and keeping our wildlife research community informed about the SARS-CoV-2 virus and potential risks to wildlife.

For clarifications or additional information please email our Nongame Wildlife Program at wildlifemgt@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Kevin Shaffer
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

June 11, 2020

Notice of Changes to Scientific Collecting Permits (SCP) and Memorandums of Understanding (MOU) Authorizations and Information Related to Rabbit Hemorrhagic Disease Virus Serotype 2 (RHDV2)

You are receiving this letter because you currently possess an active Scientific Collecting Permit (SCP) and/or Memorandum of Understanding (MOU) for work with wildlife in California. A virulent and highly contagious viral disease of lagomorphs, Rabbit Hemorrhagic Disease Virus Serotype 2 (RHDV2), was recently detected in Riverside and San Bernardino counties. These detections follow the emergence of the disease in the past three months in the states of New Mexico, Texas, Arizona, Colorado, and several states in northern Mexico.

RHDV2 affects domestic and wild rabbits, jackrabbits, hares, and may also affect pikas. Mortality rates have ranged from 5% to more than 80% of affected populations. RHDV2 can be transmitted through contact with an infected lagomorph or its bodily fluids, feces, or by contact with a contaminated object or the environment. The virus is hardy and may remain viable on meat, fur, clothing, or equipment for up to 15 weeks. RHDV2 does not pose a health risk to humans, non-lagomorph wildlife, and other domestic animals; however, humans and animals can inadvertently spread the virus to new areas.

The California Department of Fish and Wildlife (CDFW) hereby requires all SCP and MOU permittees to incorporate the following measures into their field work to slow the spread of RHDV2 and to help inform disease tracking and management actions. These conditions are incorporated into your SCP or MOU under the authority of Title 14, California Code of Regulations, section 650(s)(2)(D), wherein CDFW may suspend, revoke, or modify any permit if, in CDFW's assessment, wildlife is vulnerable from permitted activities.

1) Report unexplained or suspected disease mortality events in wild lagomorph populations, as well as observations of moribund wild lagomorphs, to the CDFW Mortality Reporting webpage. Observations of three or more dead or ill rabbits or jackrabbits or any single snowshoe hare, pika, pygmy rabbit, or riparian brush rabbit, shall be reported.

2) Do not touch, move or salvage lagomorphs, or their carcasses or feces, unless requested to do so by CDFW or the California Department of Food and Agriculture (CDFA).

3) If you conduct field work in an area of known RHDV2 occurrence, or encounter sick or dead lagomorphs, you shall disinfect boots and gear that contact the ground at the end of each field day. Current decontamination protocols may be found at the USDA-APHIS website. Spray down boot soles and uppers and other gear with a fresh 10% bleach solution or other disinfectant known to be effective against RHDV2 and allow to dry when ready to leave the site. Note bleach solution loses potency quickly so fresh solution should be mixed every 24 hours. Check the Interactive Map

on the USDA website before going to the field to determine if the area is known to harbor RHDV2.

4) For researchers engaged in trapping of small mammals (including lagomorphs, rodents, and insectivores) and carnivores, clean and disinfect all traps after completion of trapping at a site. The recommended procedure is to thoroughly clean the traps with water and a cleansing agent, and then soak or thoroughly spray all surfaces of the traps with a fresh 10% chlorine bleach solution and allow it to stand for at least 5 minutes. Virkon-S may be used instead of bleach -- allow 10 minutes of contact time. Drying the traps in the sun after applying the disinfectant is also helpful.

5) If you are authorized to capture and handle lagomorphs, all equipment and gear that contacts captured animals or contacts the ground near animal processing areas shall be cleaned and disinfected after handling each animal. Disposable or easily disinfected gloves shall be worn during handling and disinfected or disposed of properly after handling each animal. Wipes or spray of fresh 10% chlorine bleach solution, Virkon-S or other effective disinfectant (see USDA website) shall be used for disinfecting gear and equipment. Wear dedicated clothing for work with lagomorphs and wash/dry with high heat between sites.

6) Lagomorph carcasses, meat or other body parts shall not be used for bait at traps or camera traps for carnivores or raptors or transported among study areas.

For clarifications regarding your Scientific Collecting Permit and/or MOU requirements, please contact the Nongame Wildlife Program at wildlifemgt@wildlife.ca.gov. For additional information on RHDV2, please email the Wildlife Investigations Laboratory at WILab@wildlife.ca.gov.

Sincerely,

DocuSigned by:
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State of California – Department of Fish and Wildlife

SCIENTIFIC COLLECTING PERMIT, SPECIFIC USE – Permit

DFW 1379S (NEW 09/01/17)

Permit

Specific Use Permit ID: **S-190980001-19111-001**

Reference Title: **Statewide General SCP**

Effective Date: **9/23/2020**

Expiration Date: **9/23/2023**

Permitholder

EID-190980001: Museum of Vertebrate Zoology

mkoo@berkeley.edu

3101 Valley Life Sciences Building, University of California,

Berkeley, California 94720-3160

Preferred Phone Number: 510-642-3567

Alternate Phone Number:

Permitholder Affiliation:

By signing this permit, the Permitholder agrees to the following:

"I certify that I have read, understand, and agree to abide by the applicable provisions of the Fish and Game Code, and Title 14, Section 650, CCR, and will abide by all the conditions and attachments of the issued permit. I understand I am legally responsible for ensuring all persons working under this permit will be adequately supervised, and comply with the requirements noted above. I further understand that if I fail to provide required reports, my permit may be suspended or revoked pursuant to Title 14, Section 650, CCR, and the Fish and Game Code."

Permitholder Signature:_____ Date:_____