Fisheries and Oceans Canada | Pêches et Océans Canada

Licence Number: XRSF 6 2014
File Number: SARA 316
Valid From: 25-Mar-2014
Expiry Date: 28-Feb-2015

This permit is issued to the person(s) listed below under the authority of the Minister of Fisheries and Oceans pursuant to section 73 of the Species at Risk Act (SARA), and authorizes them, subject to the following terms and conditions, to engage in scientific research activities (described below) that relate to the conservation of the affected species identified below or benefit the said species or are required to enhance its (their) chance of survival in the wild. This permit is granted as a privilege, not property, and is issued at the Minister's discretion and may be revoked or amended to ensure the survival or recovery of a species.

Licence Holder:

FIN: 121909
University Of British Columbia Dept Of Zoology 6270 University Blvd.
Vancouver BC V6T 1Z4

Schluter, Dolph

Contact Number: 604-822-2387
Fax Number: 604-822-2416

Individuals or groups assisting with the authorized activity:

Monica Yau, Diana Rennison, Seth Rudman, Sara Miller, Thor Veen and Kevin Brix.

Species, Quantity of Fish, Area(s) and Gear:

Species: Paxton Benthic and Limnetic Threespine Stickleback pairs (*Gasterosteus aculeatus*).
Vananda Benthic and Limnetic Threespine Stickleback pairs (*Gasterosteus aculeatus*).

Areas of Activity: Paxton and Priest Lakes, Texada Island, BC., Biosciences aquatic facility at the University of British Columbia (UBC).

Gear: Minnow traps, seine and dip nets, buckets, tanks, alizarin red stain, and MS222 solution.

Anticipated number of mortalities:
- Paxton Lake Benthic and Limnetic adults - no more than 40 mortalities of each type and sex.
- Paxton Lake Benthic and Limnetic juveniles - no more than 30 of each type and sex.
- Vananda Creek Benthic adults - no more than 55 of each sex.
- Vananda Creek Benthic juveniles - no more than 30 of each sex.
- Vananda Creek Limnetic adults - no more than 40 of each sex.
- Vananda Creek Limnetic juveniles - no more than 30 of each sex.

Additional Information:

Authorized Activities:

Capture Technique: Minnow traps will be used to capture fish in benthic areas in Paxton and Priest Lakes. Traps will be set for no more than 12 hours (overnight) in the non-breeding season. This will be reduced to 2 hours in the breeding season to ensure that non-target males guarding nests, and females with eggs, are released as quickly as possible. Seine and dip nets will be used to capture fish in open water. All sampling equipment, including traps, nets and boats, will be disinfected after use in each lake.

Collection in Paxton Lake will take place only within the southern basin and collection in Priest Lake will be spatially restricted as recommended in the Guidelines for the Collection and In Situ Scientific Study of Stickleback Species Pairs (2008).

Method of handling: the fish will be gently decanted from the minnow trap or net into a bucket of aerated, fresh lake water. No more than 20 fish will be placed into a single pail at the same time.

Some of the live fish sampled will be collected and held at the Biosciences aquatic facility at UBC, where they will be used in behavioural laboratory experiments.

As well, fin clips will be collected from the following numbers of wild fish that will then be released otherwise unharmed:

Benthic Paxton adult female: 75
Benthic Paxton adult male: 75
Benthic Paxton juvenile: 150
Limnetic Paxton adult female: 75
Limnetic Paxton adult male: 75
Limnetic Paxton juvenile: 150
Benthic Vananda adult female: 75
Benthic Vananda adult male: 75
Benthic Vananda juvenile: 150
Limnetic Vananda adult female: 75
Limnetic Vananda adult male: 75
Limnetic Vananda juvenile: 150

Fin snip: fish will be gently held in one hand with the tail splayed open. A sample of the top 1/8th of the tail fin will be removed. The fish will then be released into a bucket where it will be inspected for any signs of stress and then released back into its lake of origin.

Maintaining fish in the lab: fish will be raised and kept in stand-alone 100-litre aquariums with filtration and aeration. Fish will be fed twice daily with live and frozen food.

Colour vision: gene expression of opsin genes in the eyes of benthic and limnetic sticklebacks raised in a common garden will be measured using rtPCR.

Photography of live fish: live fish are briefly placed in a thin glass wafer to take high resolution photographs of lateral views. Photo images are digitized using a series of landmarks to measure fish shape. Shapes are analysed using conventional geometric mophometric methods.

Morphological measurements: preserved fish will be stained with alizarin red and photographed after the extraction of tissue for DNA analysis.

Method of Euthanasia and Disposal: for fish used in genetic laboratory experiments, the fish will be euthanized with a MS222 solution (1 part MS222 per 20,000 parts water, buffered with sodium bicarbonate). In the event of animal injury, the fish will be immediately euthanized with an overdose of MS222 and preserved in pure ethanol. These fish will be used in morphological studies and genetic analysis.

Terms and Conditions:

Pursuant to subsection 73(6) of SARA, the following terms and conditions apply to this permit:

1. The collection and handling of Benthic and Limnetic Paxton and Vananda Stickleback Species Pair individuals will be done in a manner that is consistent with the Guidelines for the Collection and In Situ Scientific Study of Stickleback Species Pairs (*Gasterosteus spp.)* (2008).

2. If the maximum number of permitted mortalities specified in this permit is exceeded, sampling activities must be discontinued immediately and Species at Risk Senior Biologist Nadine Pinnell contacted at 604-666-7017 or

Nadine.Pinnell@dfo-mpo.gc.ca to report the occurrence and to determine any potential for any further works that may require handling of these Stickleback Species Pairs.

3. The permit is only valid for the activities described within. It (or a copy) must be carried by a member of the field crew and be made available to a Fishery or Conservation Officer upon request.

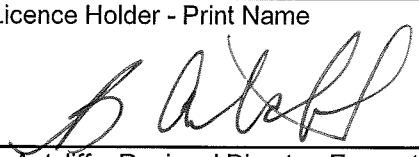
4. The permit does not replace any other permits required under provincial or federal legislation.

5. By December 31, 2014 a comprehensive report must be filed detailing any activity, authorized by this permit, which results in killing, harming, harassing, capturing or taking of any individuals of the affected species above, that occurred between the permit start date and the end of December 2014. If the individuals were captured and are being held then the permit holder must also indicate where they are being held and what is planned for these captured individuals (death, release, etc.). A similar comprehensive report detailing activities occurring between December 2014 and the end date for this permit must be filed by December 31, 2015. The completed reports shall be sent to:

Tracey Sandgathe
Species at Risk Regional Manager
Fisheries & Oceans Canada
Suite 200 - 401 Burrard Street
Vancouver, B.C. V6C 3S4
Telephone: (604) 666-0395
Facsimilie: (604) 666-0417
sara@pac.dfo-mpo.gc.ca

By signing on this document, the person(s) listed below, agree to be bound by the terms and conditions that pertain to each person as an individual and to the group as a whole.

121909	Dolph Schluter		March 26, 2014
FIN	Licence Holder - Print Name	Signature	Date



MAR 25 2014

Issued by: Bonnie Antcliffe, Regional Director, Ecosystems Management Branch — Date
Fisheries and Oceans Canada

Licence Issued: 25 March 2014

Licence Printed: 25 March 2014