University of Washington Research Study

NATIVE CRAYFISH IN WASHINGTON CLASSROOMS

- Classroom Research Protocol and Data Collection -

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Contacts

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Background

Thank you for participating in the UW research study evaluating the suitability of native crayfish in Washington classrooms! The objective of the study is to determine if classroom survival and behavior of signal crayfish (*Pacifastacus leniusculus*), which is native to the Pacific Northwest, differs to the non-native red swamp crayfish (*Procambarus clarkii*) commonly used in the classroom. Knowledge gained from this research study will help ensure the success for transitioning to the exclusive use of native crayfish in Washington schools planned for Fall 2011. This will also inform similar efforts in other states. Data collection forms are provided outlining the information we need collected in classrooms using either native or non-native crayfish (or both). We greatly appreciate your participation in the research study and thank you for being part of the first-ever statewide effort to use native crayfish for education and classroom use.

Native signal crayfish

Non-native red swamp crayfish

Data Collection Form Procedures

General Information

To participate in this study, the following information is needed:

- Who you are,
- Where and what grade you teach,
- What science curricula you use (if relevant),
- What date you received your crayfish,
- How many crayfish you received,
- The species you're using, and
- The source(s) of the crayfish (if known – if applicable you can refer us to your district's science distribution center).

In addition, we need the following information on the conditions in which your crayfish are kept, including:

- What size container(s) are the crayfish housed by gallons and outside dimensions?
- What source(s) of water is used to fill the container?
- Once filled, is the container water filtered or aerated?
- How many crayfish and what species are put in the container(s)?
- What do you feed your crayfish, what quantity, and how often?

Finally, please characterize notable aspects of crayfish behavior in your classroom.

- Were the crayfish (by species if using both native and non-native) aggressive or easy to handle?
- Did they escape from containers, or cannibalize each other?
- Any observations or comments on crayfish and their utility in your science unit are appreciated.

Survival Information

Most importantly, we need to characterize how well the crayfish survive under classroom conditions. To do this, you will need to collect data on the daily health of each individual crayfish over the course of its time in your classroom. Record individual crayfish status might be a good classroom assignment for a student, or a rotation among students.

- Record the survival status of each crayfish on each day.
- Record which days crayfish were fed, what they were fed, and quantity.
- Record which days their water is changed and if water sources, container, filtration, or aeration conditions change.
- Record which days a crayfish dies and its species.

All data is recorded on the provided data forms in either the paper or electronic versions provided. At the end of your use of crayfish, please return this data to **BOTH** your district's

science curriculum coordinator and to Julian Olden at olden@uw.edu. Please include the statement "UW Crayfish Project" in the message subject.

Care Recommendations for Crayfish

A preliminary study at the University of Washington Summer Institute for Life Sciences during July 2010 found comparable survival between native and non-native crayfish in the classroom over four weeks. Teachers participating in the preliminary study felt that native crayfish were more docile and easier to handle than non-native crayfish, but were also more prone to escape from containers. Native crayfish were found to tolerate Seattle tap water without further filtration or aeration, but other sources of water may be used including from local waters. We also recommend providing crayfish access to a surface to crawl out of the water (e.g., rocks or half a ceramic pot) within the container. Weekly water changes are also recommended. Native crayfish were sensitive to being over-fed due to resultant water quality issues (fecal waste), and we suggest feeding the crayfish only twice a week in fairly small volumes. However, your observations on keeping these animals will be used in developing more robust protocols and recommendations for other teachers – so please let us know what works and doesn't in your classroom!

Summary of recommendations:

- Use a high walled container at least 4 inches tall;
- Provide a surface where crayfish can crawl out of the water;
- Tap water without further filtration or aeration is okay;
- Change water weekly
- Feed small amounts twice a week following curriculum recommendations; and
- Take good notes whether using these recommendations or others.

Disposal Recommendations for Crayfish

Unfortunately, laboratory crayfish (regardless of native or non-native status) cannot be released into the wild or given to students as pets. Non-native crayfish have high potential to become invasive species or transmitting diseases or parasites to native species if released, negatively affecting populations and freshwater ecosystems in Washington. Native crayfish may also transmit diseases from where they were originally captured or from crayfish caught in other locations to wild populations. They may also hybridize with unique populations of native crayfish.

We recommend that crayfish be kept and reused between teaching units, whether in your classroom, between classrooms, or at a science distribution center in your school or school district. This can save you money and minimize the need for euthanasia. If these options are not available, crayfish must be humanely euthanized. The most common way is by first gradually cooling (e.g., in a refrigerator or on ice) and then freezing for at least 24 hours. Once frozen, place crayfish in sealed bags (zip-lock type) and dispose in the refuse bins. Any water from the container used to keep the crayfish must be drained into a sewer

system connected to a treatment facility, septic system, or on dry ground that is not near, or would drain to local waters. Any plant or other material in the containers must also be properly disposed in a similar manner (probably shouldn't put gravel or rocks in the drain).

While euthanasia is understandably a difficult topic, especially in a classroom setting in which students may have become attached to laboratory organisms, it is important to teach the students that protection of native wild resources is critical and that animals released from captivity have already caused great harm to wild populations and ecosystems in our state. Our collaborators at NOAA Sea Grant are working with science curricula developers and biological supply companies to better address these issues in the long term.

Commonly Asked Questions

Where are native crayfish available?
At present, native crayfish are available through Mountain Home Biological Supply (www.pelletlab.com). These crayfish are harvested under legal commercial permits in the Washington State. Some teachers have reported collecting their own native crayfish for classroom use. If you are interested in collecting your own crayfish for the classroom, please be familiar with Washington Department of Fish and Wildlife regulations relevant to crayfish (http://wdfw.wa.gov/fishing/regulations/). While a fishing license is not required to collect crayfish, there is an open season (first Monday in May to October 31st), minimum size limit (3 ¼ in), and some sex (non-berried females cannot be collected) and gear restrictions (five traps or pots, labeled with your name and address, and including a biodegradable release device). If you wish to collect native crayfish outside of the recreational season, please contact the department for a scientific collection permit.

Are non-native crayfish still allowed in the classroom?
One species of non-native crayfish, the red swamp crayfish *Procambarus clarkii,* will be allowed in the classroom through the 2010/2011 school year under a special permit from the Washington Department of Fish and Wildlife. This special permit will not be renewed in the future, requiring a complete transition to permitted (native) crayfish in the classroom.

What crayfish will be available in the future?
Following the 2010/2011 school year, non-native crayfish will not be allowed in for use in Washington State science curriculums. The pilot project you are participating in is intended to develop protocols that will allow for a smooth transition to native crayfish statewide in 2011. Additional information on the transition to native crayfish will be forthcoming in spring 2011.