for Survey on Mining Claim (Form 3860–5).

*Description of Respondents:* Owners of unpatented mining claims and mill sites upon the public lands, and of reserved mineral lands of the United States, National Forests, and National Parks.

*Estimated Annual Responses:* 10 responses.

*Estimated Annual Burden Hours:* 496 hours.

**Jean Sonneman,**

*Information Collection Clearance Officer, Bureau of Land Management.*

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**BILLING CODE 4310–84–P**

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## DEPARTMENT OF THE INTERIOR

### Bureau of Reclamation

[RR0810000, 15XR0680A1, RY.1541CH20.1430001]

**Announcement of Requirements and Registration for a Prize Competition Seeking Methods or Devices That can Quantify Drift Invertebrates in River and Estuary Systems**

**AGENCY:** Bureau of Reclamation, Interior.

**ACTION:** Notice.

**SUMMARY:** The Bureau of Reclamation, in collaboration with other federal agencies (National Oceanic and Atmospheric Administration-National Marine Fisheries Service, U.S. Geological Survey, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers) is announcing a prize competition for seeking a way to economically detect, count, and identify zooplankton and drift invertebrates in river and estuary systems. Problems identified that prevent the simple transfer of oceanographic techniques to rivers and streams are higher water velocities, turbidity, higher surface/depth ratio, and costs (time and money).

**DATES:** Listed below are the specific dates pertaining to this prize competition:

1. Submission period begins on October 7, 2015.

2. Submission period ends on November 16, 2015.

3. Judging period ends on January 15, 2016.

4. Winners announced by January 29, 2016.

**ADDRESSES:** The *Quantifying Drift Invertebrates in River and Estuary Systems* Prize Competition will be posted on the following crowd-sourcing platforms where Solvers can register for this prize competition:

1. The Water Pavilion located at the InnoCentive Challenge Center: *https://www.innocentive.com/ar/challenge/browse.*

2. U.S. Federal Government Challenge Platform: *www.Challenge.gov.*

3. The Nature Open Innovation Pavilion at *http://www.nature.com/openinnovation/index.html.*

4. The Scientific American Citizen Science Center at *http://www.scientificamerican.com/citizen-science/.*

InnoCentive, Inc. is administering this challenge under a challenge support services contract with the Bureau of Reclamation. These Web sites will re-direct the Solver community to the InnoCentive Challenge Center as the administrator for this prize competition. Additional details for this prize competition, including the Challenge Agreement specific for this prize competition, can be accessed through any of these prize competition web addresses. The Challenge Agreement contains more details of the prize competition rules and terms that Solvers must agree with to be eligible to compete.

**FOR FURTHER INFORMATION CONTACT:** Challenge Manager: Dr. David Raff Science Advisor, Bureau of Reclamation, (202) 513–0516, *draff@usbr.gov*; or Mr. Chuck Hennig, (303) 445–2134, *chennig@usbr.gov.*

**SUPPLEMENTARY INFORMATION:** The Bureau of Reclamation is announcing this prize competition in compliance with 15 U.S. Code 3719, Prize Competitions. Habitat restoration, improvement, and creation in rivers, streams, and estuaries are key elements for the recovery of salmon, trout, and other critical fish species in the United States. Millions of dollars are spent annually on activities such as manipulating flow regimes, adding structural elements such as wood or rock, reconnecting rivers with their floodplains, and restoring wetlands. A critical aspect in evaluating the effectiveness of these habitat manipulations is understanding how they influence the food resources available to critical fish species targeted for recovery and protection. Yet despite its importance, quantification of food resources has proven difficult.

A solution is being pursued through a prize competition because the Bureau of Reclamation and the collaborating Federal agencies want to seek innovative solutions from those beyond the usual sources of potential solvers and experts that commonly work in the fish recovery management domain. We find ourselves often wondering if

somebody, somewhere may know a better way to quantify the availability of food sources for threatened and endangered fish. The prize competition approach enables us to reach new sources of potential solvers to discover other technologies that could be adopted for this purpose; or generate new solutions that would not likely be accomplished by standard contractual methods.

Challenge Summary: Accurate food counts, such as zooplankton and drift invertebrates, are instrumental in fish habitat evaluation and restoration in our rivers and streams. Although technology has been developed for automated detection and identification of zooplankton and drift invertebrates in oceanographic settings, they have not been developed for the unique environmental conditions in rivers and estuaries. High flow rates and turbidity cause problems with automated visual systems used today. The main obstacle in estuaries is turbidity while the main obstacle in river systems is flow velocity. In addition, the horizontal nature of rivers invokes problems not encountered in deep ocean waters (*e.g.,* sunlight effects at the surface of water and the mixing of food sources throughout the water column in rivers due to turbulence as opposed to more stratified food webs in ocean waters). We would like to identify devices/methods that can detect, count, and identify zooplankton and drift invertebrates in an economical way in rivers and estuary systems. There is potential for future collaboration with the Seeker in developing and testing winning solutions.

This is a Theoretical Challenge that requires only a written proposal to be submitted. The Challenge award will be contingent upon theoretical evaluation of the proposal by the Bureau of Reclamation (Seeker). The Seeker has a total prize pool budget of $30,000 to pay the top three submission(s) that meet or exceed the criteria below, an award of $10,000 each. No awards are guaranteed unless they meet or exceed the criteria, and more than one award is not guaranteed. If only a single submission meets or exceeds the criteria, the prize award may be as high as $15,000.

To receive an award, the Solvers will not have to transfer their exclusive intellectual property rights to the Seeker. Instead, they will grant to the Seeker a non-exclusive license to practice their solutions.

The Seeker believes there might be a potential for future collaboration with awarded Solver(s), although such collaboration is not guaranteed. The Seeker may also encourage Solver(s) to

further develop and test their winning submissions through subsequent round(s) of competition. Solvers should mention if they have the ability for subsequent design and development phases and would be willing to consider future collaborations and/or subsequent competitions.

Background: Habitat restoration is considered a key element of fish recovery, and the quality of habitat and food resources available to fish often needs to be evaluated before and after restoration actions. Habitats are often designed to provide increased foraging and rearing habitats at appropriate spatial and temporal scales. Abundance of key food resources for fish such as zooplankton and drift invertebrate (1 mm to 20 mm in size) is time-intensive and expensive to measure, especially for juvenile salmon in a highly dynamic and complex system such as the Sacramento-San Joaquin Delta (California).

Traditional sampling methods involve the use of towed nets (for slow-moving water) or stationary nets (for fast-moving water) that collect organisms from the water column. Both the field collection of samples and the subsequent sorting and identification of collected invertebrates are time-intensive and expensive, and agencies lacking technical expertise must often rely on outside experts to process samples. Because of the high costs associated with these traditional methods, the spatial and temporal extent of sampling is often inadequate to characterize food availability at scales that are biologically relevant.

In the marine science community, significant advances have been made in plankton monitoring through the use of devices that capture high-resolution images of particles (≤100 μm) and invertebrates. These devices produce a catalog of time-stamped images that can be processed to various taxonomic levels with image analysis software, allowing the abundance of organisms in a known volume of water to be quantified. Examples can be found in the following links: *http:// jaffeweb.ucsd.edu/node/317*, *http:// www.artynet.fr/hydropticREDIRIDEM/ uvp.html*.

Analogous technologies for freshwater environments do not exist, but could be developed to continuously monitor the prey abundances and dynamics in key locations for migrating and rearing fishes. Pilot systems have been tested in the freshwater environment, but there have been problems with image capture, leading to poor image quality (blurred) and poor identification (low probability of differentiating target organisms from

drift algae, detritus and other materials). The difficulties during the pilot were likely caused by

- High water velocity
- Low water clarity (turbidity)
- Small target size (1–20 mm)

Another big difference between the marine ocean environment and the freshwater and estuarine environment is that ocean monitoring tends to be vertical (in the water column) and items on the surface are not a large percentage of the whole so they can be ignored. In a stream, items on the surface are a high percentage of the overall water column, and sunlight at the surface affects the imaging equipment considerably. It is difficult to get accurate measurements if targeted items on the surface are ignored.

The Challenge: A device/method is sought that could be deployed to collect data continuously (over hours, preferably days) to capture tidal and day/night variation in prey abundance in rivers and streams. By simultaneously deploying multiple units, scientists could measure important spatial and temporal variation such as depth stratification and source/ sink food web dynamics.

The device/method must detect, count, and identify drift invertebrates automatically in a size range of 1 to 20 mm in a cost-effective method.

Our goal is to identify ideas and help promote their testing and manufacture for use in the industry. There is potential for awarded Solvers who are interested to continue in the development of these ideas for a commercial product.

Multiple government agencies would likely be interested in this solution (Bureau of Reclamation, U.S. Geological Survey, National Oceanic and Atmospheric Administration-National Marine Fisheries Service, U.S. Army Corps of Engineers, State Fish and Wildlife agencies, and others).

**Things To Avoid**

1. Equipment made today for oceanographic study—although a good place to start, we are familiar with what exists and our Challenge is to go beyond what exists for our particular problems in freshwater systems.

2. A simple list of equipment without explanation of how they work in concert will not suffice as a description of the system.

**Any Proposed Solution Should Address the Following Technical Requirements**

*Must Haves*

1. The device/method should be able to:

a. Detect representative samples of drift invertebrates (1–20 mm). This should include those targeted items floating on the surface to a high degree as well as those in the water column. Representative samples of drift invertebrates in California and other localities are available at the California Department of Fish and Wildlife's Aquatic Bioassessment Laboratory digital reference collections (*http:// www.dfg.ca.gov/abl/Lab/ referencecollection.asp*).

b. Count the targeted items in samples (sort out debris from targeted zooplankton and invertebrates to minimize false positives).

c. Identify the number and taxonomic family (or groups of morphologically similar families) of specimens detected (**Note:** exact identification of each species is not as critical as identification of the total amount of food available to fish).

2. Requirement no. 1 must be done under the following conditions:

a. Velocities between 0 and 1.5 meters per second.

b. Turbidity between 0 and 100 Nephelometric Turbidity Units.

c. Function in shallow water (less than 1 m) and deep water (up to 20m).

d. Function over a long period of continuous deployment (greater than 24 hours but preferably many days).

e. Operate without natural light (at night or dark spaces, provides own light source as needed).

f. Operate under bright light conditions near the surface in the daytime.

3. If the device is submersible in water, it should be durable enough to be deployable when towed off a boat.

4. If optical, it should be able to capture images without a blur.

5. The device/method must be able to accurately sample and image available drift invertebrates (food) with 95 percent accuracy.

6. The device/method must measure the size of each target item within 0.5 mm or 10 percent of item size.

7. The total cost of the equipment should be targeted to not exceed $100K when produced in larger quantities.

8. The proposed system should offer the Seeker client "freedom to practice." There should be no third-party patent art preventing the use of specific equipment and materials for their commercial application.

*Nice to Have*

Include ability to measure flow entering device, such that number of food particles per volume of water is estimable.

Project Deliverables: This is a Theoretical Challenge that requires only

a written proposal to be submitted. The Challenge award will be contingent upon theoretical evaluation of the proposal by the Seeker. The submitted proposal should include the following:

1. Detailed description of a method/ device that can detect, count, and identify drift invertebrates in fresh water rivers and streams. The Solver must describe with a high level of technical detail as to how the system would meet or not meet each of the ''must have'' and ''nice to have'' attributes in Technical Requirements described above. The Solver should expect that their submittal will be reviewed by experts in the field of biology and multiple fields of engineering.

2. Rationale as to why the Solver believes that the proposed method/ device will work. This rationale should address each of the Technical Requirements described in the Detailed Description and should be supported with relevant examples.

3. The active principle applied for detection and quantification shall be described in detail. The detecting technology shall be described in detail. Potential technology suppliers shall be identified.

4. Sufficient data to support claims, if available.

5. List of equipment required with cost estimates.

6. The Solver needs to describe how deployable and workable the system would be under a wide variety of environmental conditions including water depths, light, turbidity, salinity, velocities, and turbulence such as those found in small to large streams in the western United States.

The proposal should not include any personal identifying information (name, username, company, address, phone, email, personal Web site, resume, etc.).

The Challenge award will be contingent upon theoretical evaluation of the proposal by the Seeker against the Technical Requirements.

Solutions that meet the requirements will also be judged on the following items in order of priority:

- Practical feasibility;
- Detection precision;
- Manufacturing cost;
- Required power source; and
- Extra weight/space;
- Time to market.

Judging: After the Challenge deadline, the Seeker will evaluate the submissions and make a decision with regards to the winning solution(s). All Solvers that submitted a proposal will be notified on the status of their submissions. However, no detailed evaluation of individual submissions will be provided. Decisions by the Seeker cannot be contested.

Submitted solutions will be evaluated by a Judging Panel composed of scientists, engineers, and other related technical experts. The Judging Panel will also have consultation access to technical experts outside of their expertise, as determined necessary, to evaluate specific submissions.

Eligibility Rules: To be able to win a prize under this competition, an individual or entity must:

1. Agree to the rules of the competition (15 U.S. Code 3719(g)(1));

2. Be an entity that is incorporated in and maintains a primary place of business in the United States, or (b) in the case of an individual, a citizen or permanent resident of the United States (15 U.S. Code 3719(g)(3));

3. Not be a Federal entity or Federal employee acting within the scope of their employment; (15 U.S. Code 3719(g)(4));

4. Assume risks and waive claims against the Federal Government and its related entities (15 U.S. Code 3719(i)(1)(B)); and,

5. Not use Federal facilities, or consult with Federal employees *during the competition* unless the facilities and employees are made available to all individuals and entities participating in the competition on an equitable basis.

The following individuals or entities are not eligible regardless of whether they meet the criteria set forth above:

1. Any individual who employs an evaluator on the Judging Panel or otherwise has a material business relationship or affiliation with any Judge.

2. Any individual who is a member of any Judge's immediate family or household.

3. The Seeker, participating organizations, and any advertising agency, contractor or other individual or organization involved with the design, production, promotion, execution, or distribution of the prize competition; all employees, representatives and agents thereof; and all members of the immediate family or household of any such individual, employee, representative, or agent.

4. Any individual or entity that uses Federal funds to develop the proposed solution now or any time in the past, unless such use is consistent with the grant award, or other applicable Federal funds awarding document. NOTE: Submissions that propose to improve or adapt existing federally funded technologies for the solution sought in this prize competition are eligible.

Consultation: Fish recovery program managers and technical specialists from across the Bureau of Reclamation, U.S. Geological Survey, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration-National Marine Fisheries Service, and U.S. Army Corps of Engineers were consulted in identifying and selecting the topic of this prize competition. Direct and indirect input from various stakeholders and partners associated with the fish recovery program efforts by these agencies were also considered. In addition, the Bureau of Reclamation maintains an open invitation to the public to suggest prize competition topics at *www.usbr.gov/research/ challenges*.

Public Disclosure: InnoCentive, Inc. is administering this challenge under a challenge support services contract with the Bureau of Reclamation. Participation is conditioned on providing the data required on InnoCentive's online registration form. Personal data will be processed in accordance with InnoCentive's Privacy Policy which can be located at *http:// www.innocentive.com/privacy.php*. Before including your address, phone number, email address, or other personal identifying information in your proposal, you should be aware that the Seeker is under no obligation to withhold such information from public disclosure, and it may be made publicly available at any time. Neither InnoCentive nor the Seeker is responsible for human error, theft, destruction, or damage to proposed solutions, or other factors beyond its reasonable control. Solver assumes any and all risks and waives any and all claims against the Seeker and its related entities, except in the case of willful misconduct, for any injury, death, damage, or loss of property, revenue, or profits, whether direct, indirect, or consequential, arising from participation in this competition, whether the injury, death, damage, or loss arises through negligence or otherwise.

Dated: September 30, 2015.

**David Raff,**

*Science Advisor.*

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**BILLING CODE 4332–90– P**