



ISSUE 20

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AQUATIC INVASIVE SPECIES NEWS IN A NUTSHELL

Joan Cabreza, Editor

About this newsletter: This origin of this newsletter is attributable to Joan Cabreza, who while working for the Environmental Protection Agency (EPA) produced the newsletter “Invasive News in a Nutshell.” Joan retired from the EPA earlier this year and agreed to continue as the editor of the “the Nutshell” under the Pacific States Marine Fisheries Commission’s (PSMFC) Aquatic Nuisance Species Program. Like its precursor, it focuses primarily on regional and aquatic issues, but it also contains some terrestrial, national and international invasive events of interest. Contents do not necessarily reflect views of the PSMFC. Direct questions, comments, and news tips, to Joan_cabreza@psmfc.org. Find Nutshell issues 1-19 at <http://yosemite.epa.gov/r10/ECOCOMM.NSF/Invasive+Species/Document-Library>

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Zebra Mussel Activity

Columbia River “BasinWatch” Newsletter. The Columbia River Basin 100th Meridian Partnership Program fosters dialog between resource managers, marinas, resorts and other water users to prevent the introduction of zebra and quagga mussels into the Columbia River Basin. One facet of this initiative is the Basin Watch newsletter, sponsored by PSMFC. To see the latest issue go to <http://www.aquaticnuisance.org/docs/Columbia%20River%20Basin%20Watch%202008%20Newsletter.pdf>.

New Zebra Mussel Video Now Available. The new two-part video, *Don’t Move A Mussel*, an educational video produced by PSMFC, the USFWS, and Western State Fish and Wildlife Agencies, is now available. Part 1 of the video (29 minutes) provides background information on the origin, distribution, biology, life history and dispersal

methods of zebra/quagga mussels and industry experts, resource managers and scientists describe their impacts on agriculture, power production, water supply, fisheries, shipping, recreation and the ecosystem. Part one is now available for viewing on-line in both Windows Media and Quicktime formats. Part 2 (17 minutes) is a watercraft inspection and decontamination training video that includes a detailed step-by-step demonstration of how to inspect trailered watercraft for mussels, and how to successfully decontaminate it if mussels are found. *NOTE: this replaces the former "It Only Takes One" video. (To see the video go to <http://100thmeridian.org/video.asp> (Thanks to David Britton)*

Zebra Mussel Quarantine Estimator. The 100th Meridian Initiative has placed a helpful zebra mussel quarantine estimator on its website that allows you to estimate how long a boat should remain out of the water before it is considered safe to launch. The estimator is based on local temperature and humidity. Figure out the quarantine time for your location, by going to [<http://www.100thmeridian.org/Emersion.asp>].

Zebra/Quagga Mussel Distribution Map. The CA quagga mussel infestation is spreading rapidly. To see a current map of the infestation, go to the USGS website at [<http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/maps/CaliforniaDreissenaMap.jpg>] and then click on the map to enlarge it. *(Thanks to Dan Hilburn)*

Draft Dreissena Enforcement Strategy and Protocol . The OR State Marine Board (OSMB) has developed a draft enforcement strategy and protocols for boat inspection and decontamination. It spells out enforcement authority, contains a decontamination station list, and also contains a boat inspection form that may be a useful template for other agencies to use. So far, 3-400 officers have been trained in the protocols. *(For more info, contact Randy Henry, at <randy.h.henry@state.or.us>).* The OSMB has also developed a public outreach effort to educate boaters on AIS issues. They have placed highway billboards up around the state, developed newsprint ads, 11"x17" posters and a three-part short, animated video. To see the video, go to: [<http://www.youtube.com/watch?v=0qZ-FVEnFkw>] *(Thanks to Glenn Dolphin, via Stephen Phillips)*

Pacific Northwest Mussel Response Plan and Rapid Response Exercise (Update). The regional Zebra/Quagga mussel rapid response plan is essentially done and just awaiting signatures from members of the Multi-Agency Coordination (MAC) group. A 1-page Frequently Asked Questions sheet has also been drafted to assist managers who are expected to sign off on the plan. The second multi-agency rapid response exercise is tentatively planned for **October 2008**, and will incorporate lessons learned from last year's response exercise. *For more info, contact Paul_Heimowitz@fws.gov or stephen_phillips@psmfc.org*

Biocontrol for Quagga/Zebra Mussels. In 1991, the Empire State Electric Energy Research Corporation (ESEERCO) contracted with the New York State Museum (NYSM) Field Research Laboratory to screen bacteria as potential biological control agents for zebra mussels. After screening trials on more than 700 bacterial strains, only a

North American isolate, strain CL145A of *Pseudomonas fluorescens*, was identified as able to produce >90% zebra mussel kill. When a zebra or quagga mussel ingests artificially high densities of strain CL145A, toxin within the bacterial cells destroy the mussel's digestive system. Dead cells are equally as lethal as live cells, indicating that the mussels die from a natural compound, not from infection. The bacteria are more effective in higher temperatures and in harder water, and they kill all mussel sizes and stages. Techniques have been developed at the NYSM laboratory that kill the bacteria without reducing their lethality to the mussels. Patents have been issued in both the US and Canada, and commercial products developed by Marrone Organic Innovations (MOI), based on this microorganism will contain dead cells, further reducing environmental concerns. Molloy and Marrone hope to begin testing the bacteria in the either Hoover Dam or Davis Dam hydroelectric dam pipes this year, as the next step toward developing a product that could be used commercially by power plants and water treatment facilities as soon as late 2009 or early 2010. But there are still several hurdles before testing could begin, including EPA permitting. EPA issues experimental use permits, but (as of June 20) the company had yet to apply for registration of its product. The bacteria would likely require an EPA experimental use permit, and Marrone will test different formulas, including pellets, liquids and powders. For more information, contact <pmarrone@marroneorganics.com> or <dmolloy@mail.nysed.gov>. (From MOI info sheet "Biocontrol for zebra/quagga mussels. An environmentally friendly Biological Control of Zebra and Quagga Mussels with *Pseudomonas fluorescens* Strain CL145A" and Las Vegas Sun article, June 20.)

CA Zebra Mussel Update. The CA prevention program has now inspected over 100,000 boats, and cleaned over 10,000, 135 of which were found to have mussels. In spite of this effort, quagga mussels have been found now in 16 reservoirs within the Colorado River basin, and zebra mussels have been found in San Justo reservoir. Other prevention activities include development of a new policy requiring boat permits at fishing tournaments, and developing protocols for private aquaculture. There is a proposal for eradication in San Justo, but use of *Pseudomonas* is still considered premature; Marrone Industries has a permit to set up a lab, but has not yet received all necessary EPA permits. (Thanks to Sue Ellis, CDFG)

The 100th Meridian Meeting. The quarterly interagency workgroup meeting was held June 11, in Portland. Minutes for all of the 100th Meridian meetings, as well as additional information on the status of the western zebra mussel invasion, are available on the 100th Meridian website [<http://www.100thmeridian.org>]. The next meeting of the 100th Meridian is tentatively scheduled for **October 15**. Find a very comprehensive bibliography on zebra mussels on this site as well!

[Ed. comment] Obviously a lot of work on mussels is being done on many fronts! But more effort is apparently needed if we are going to effectively be able to stop the mussel's spread. Boats have been released from Lake Mead without being cleaned (apparently due to lack of staff), and a communication protocol to deal with boats known to slip through checkpoints is also needed. Increased funding for staffing at Lake Mead, and for the BOR reservoirs is also believed essential.

Other Pacific Northwest Infestations

Knotweed Nomenclature Revision. The recently published vol. 5 of the *Flora of North America*, which incorporates all of the latest taxonomic revisions for the Polygonaceae, indicates genus changes for our invasive knotweeds. Here's the latest, thanks to Fritzi Grevstad, of UW. The 3 larger knotweeds are all in the genus Fallopia: giant knotweed (*Fallopia sachalinensis*), Japanese knotweed (*Fallopia japonica*), and the hybrid Bohemian knotweed (*Fallopia x bohemica*). Himalayan knotweed is in a different genus, and also has a new name (*Persicaria wallichii*). (*Pers. communication from Fritzi Grevstad*)

WA Knotweed Program (Update). Marshall Udo, WA State Knotweed Coordinator, indicates the results of chemical treatment appear to vary with the knotweed species. Himalayan knotweed appears to be the most susceptible to treatment, followed by giant knotweed, with Japanese and Bohemian (hybrid) knotweed appearing to be the most resistant species. Foliar applications are still generally the most efficient way to handle large infestations, and Imazapyr is being used now for foliar applications, either alone or in combination with glyphosate, with good results (1% for Imazapyr alone, 4% for glyphosate alone, or a mixed 3% glyphosate/ 0.5% Imazapyr solution.) Field work also indicates that, although the application rate on the label for glyphosate injection is listed at 5 ml, 3 ml of glyphosate seems to work just as well for control.

Several knotweed reports are also now available that may be of interest: The *WA 2007 Knotweed Program Annual Report* is now also available; access it online at: [<http://www.agr.wa.gov/PlantsInsects/Weeds/Knotweed/docs/KnotweedAnnualReport2007.pdf>]. The Dept. of Ecology *IPM Plan* also has updated knotweed control information, and discusses the latest variety of treatments, including injection. See it at: [http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/noxious/IPM%20for%20knotweeds_updated_11-07.pdf]. And lastly, a research paper *Evaluation of knotweed control projects in southwest Washington*, by Tim Miller, provides some interesting information, and can be accessed at: [http://agr.wa.gov/PlantsInsects/Weeds/Knotweed/docs/Knotweed_Evaluation_SW_WA.pdf]. (For more knotweed info, contact Marshall at <mudo@agr.wa.gov> or Tim, at <twmiller@wsu.edu>.)

WA Spartina Program (Update). Imazapyr continues to work well for *Spartina* control in Willapa Bay, WA. At its peak, *Spartina* infestations spread over 25,000 acres, covering an equivalent of 8500 net (solid) acres in the bay. One of the greatest challenges is timing spray applications so there is sufficient dry time to allow the plant to take up the chemical. Studies by WSU showed that ~1.5 foot of plant material needs to be exposed for a minimum of 6 hours for Imazapyr to be effective. Given the complex depth variations and tidal height fluctuations within the bay, finding the optimal spray times and locations has required sophisticated GIS analysis. The Olympic Natural Resources Center developed a program integrating LiDAR bathymetry layer with tidal prediction

software to identify optimal areas and times for spraying. Now, 95% or more of the infestation has been eliminated. By next year, only 100-200 net acres will remain, in the form of small patches, none greater than ¼ acre. The most daunting challenge will be cleaning up the "tidal guts," the network of hundreds of miles of drainage sloughs within tidal influence that feed into Willapa Bay. Another task is to implement the transition to greater state and local responsibility. 2008 is the last year of a 6-year federal plan. After 2008, federal funding for bay-wide operations will end. Crews of the Willapa Bay National Wildlife Refuge have been responsible for operations on 20,000 acres, or 80% of the bay, in 2007 and 2008. Starting next year, the refuge will maintain operations only on refuge lands (roughly 7,000 acres, or ~30% of the Bay). This means that the Departments of Agriculture, Natural Resources, and Fish and Wildlife, and Pacific County will have to take over responsibilities for final eradication on an additional 13,000 acres. Discussions are underway to plan how this last and most difficult phase of the eradication effort can be carried out successfully. Much of the Bay now looks free of *Spartina*. But eradication is the goal, and this is not the time to slack off, just because *Spartina* is now less obvious. (Thanks to Miranda Wecker)

Another Mussel Species Found.. On April 2, WDFW received a tip that a boat docked at a marina in LaConnor, WA (marine water) contained zebra mussels. The mussels were subsequently determined to be Conrad's False Mussels (*Mytilopsis leucophaeta*), a zebra mussel relative that can be just as bad at biofouling in brackish systems as the zebra and quagga are in freshwater. The boat was on a barge from LA for a month, went through the Panama Canal, off-loaded in Victoria, BC, and was in WA waters for nearly two weeks before interception. (Thanks to Allen Pleus, WDFW)

Puget Sound Tunicate (Update). For the third year in a row, WDFW and contract divers are removing rapidly spreading colonies of invasive tunicates (*Styela clava*) from boat hulls in six Puget Sound marinas. From the end of May through June 30, divers removed tunicates at marinas in Blaine, Semiahmoo, Elliot Bay, Des Moines, Dockton (Maury Island) and Pleasant Harbor (Hood Canal). This year, the aim is full eradication at Dockton. As filter feeders, the tunicates compete for food and smother native sea life including clams, mussels and oysters, and they have no natural predators. First discovered on a sunken boat in 2004 near Edmonds, now there are more than a dozen colonies found throughout the Sound from Des Moines to Birch Bay. The tunicate problem is so severe that the state Legislature has provided emergency funding for WDFW to develop and carry out an eradication plan. WDFW is informing boat owners about their liabilities and the potential fines they face if their boats are moved without being cleaned. (From May 28 WDFW press release. For more info contact <pleusaep@dfw.wa.gov>)

New Hydrilla Infestation. Just as WA is cautiously declaring victory over Hydrilla, last December, Hydrilla (*Hydrilla verticillata*) was identified along approximately 7 miles of the Bruneau River and in two irrigation ditch systems in Southwest ID. Treatment was complicated because the infestation coincides with the recovery area for the Endangered Bruneau Hot Spring snail (*Pyrgulopsis bruneauensis*), so volunteers from an impressive variety of local, state and federal agencies first attempted two days of hand-pulling.

When it became clear that physical removal alone was insufficient, agencies worked with landowners throughout the Bruneau Valley to limit the amount of hydrilla fragments expected to be generated from high flow scouring during spring runoff. On February 25th, the river was treated with diquat (Reward) herbicide. Bruneau Valley residents cooperated by turning off their ditches and preventing their cattle from watering in the river for 48 hours following treatment. The USFWS conducted surveys before and after the treatment. Initial survey results suggest the herbicide did not adversely impact snail numbers immediately downstream, but it reduced the living *Hydrilla* biomass by approximately 50% in the first 2 miles of river below the treatment site. The treatment effectively killed the upper portion of the plants, which is at the highest risk for fragmentation and re-infestation. But in many cases, the lower portion of the plants still remains, and will require treatment. This summer, remaining identified infestations will be controlled by volunteer hand pulling, diver-assisted suction dredging, and spot herbicide treatment. Following the irrigation season, another river diquat injection may also be conducted. Several years of treatment are expected to be required for eradication. (For more information, Contact Tom Woolf, <twoolf@agri.idaho.gov>).

WA Chytrid Fungus (Update). Since the first discovery in WA, in 2005, Steven Wagner, CWU associate professor, and his colleagues have detected the chytrid fungus (*Batrachochytrium dendrobatidis*) across the state. The fungus is blamed for amphibian population destruction worldwide. It causes the skin to thicken, and then slough off in sheets. This is a problem, because amphibians respire and regulate body fluids through their skins. Wagner refers to it as "like Ebola for frogs." The infection has now reached the Potholes Reservoir in Grant County, the last remaining WA population of northern leopard frogs. Habitat loss and predation from nonnative bullfrogs and fish have already stressed the species, and the fungus could be the final blow. Pacific Tree frogs and OR spotted frogs, found at only three sites in the state, have also had die-offs.

First discovered in 1998, the fungal disease has been implicated in the collapse of amphibian populations in Central America, Australia, Europe and elsewhere. In North America, the fungus is widespread in CA's Sierra Nevada, and it has been linked to die-offs in CO, WY, and AZ. But in South America and the Northeastern U.S., the fungus is present but does not seem to be fatal. In OR, the fungus infects about half the amphibian populations, but there do not seem to be widespread deaths. No one knows where the fungus originated, but DNA studies suggest it's a relatively recent arrival in much of the world. One theory is that it was carried out of Africa in shipments of frogs used for pregnancy tests in the 1930s. Bullfrogs, which become infected yet rarely die from the disease, also may be carriers. A frog whose immune system is weakened by UV radiation or toxins may be more vulnerable to infection, and global warming adds additional stress. Scientists disagree whether global warming has made the fungus more widespread or lethal. (From a *Seattle Times* article by *Sandi Doughton*).

And then from a May 2 Seattle Times article by Steve Ringman:

Is fungus killing frogs?

A chytrid fungus blamed for amphibian die-offs around the world has been found across the Northwest and linked to frog deaths in Washington.



Sources: ESR; Dede Olson and Kathryn Ronnenberg, USDA Forest Service Pacific Northwest Research Station; Steven Wagner, Central Washington University; Washington Department of Fish and Wildlife
THE SEATTLE TIMES

Azalea Lace Bug. In March, 2008, King County, WA, Master Gardeners detected another new pest, the azalea lace bug, *Stephanitis pyrioide*. British Columbia has also recorded a new Andromeda lace bug, *Stephanitis takeyai*. Adult lace bugs are small, up to one-eighth of an inch. They attack leaf surfaces with their piercing-sucking mouthparts, creating very distinctive chlorotic patches that eventually bronze, giving leaves a burnt, silvery appearance.



To see all of the lace bug varieties that Clemson University has identified, visit their Web site at: [<http://hgic.clemson.edu/factsheets/hgic2051.htm>]. (*From Todd Murray article in the King County Master Gardener Sound Gardening newsletter,*)

Vibrio Bacteria and Shellfish. Vibrio bacteria (*Vibrio tubiashii*) are suspected of driving wild oysters from traditionally prolific estuaries on the southern WA coast, and they are now becoming a problem for shellfish hatcheries as well. Causes of the epidemic are unclear, but the bacteria produces a protein that kills shellfish veligers, and it is not deactivated by UV radiation. Infestation has caused some major shellfish suppliers, notably the Taylor Shellfish (WA) and Whisky Creek (OR) Hatcheries, to close down. OR Sea Grant has provided a \$300k operational and research grant to Whisky Creek, to set up membrane filters in a water filtration system that is hoped will remove both the bacteria and the protein they produce. (*Thanks to Sam Chan, OSG*)

Assiminea Snail (Update). The snail has now been noted spreading northward up the coast from Coos Bay. It has been noted in very high densities, but is unique in that the highest densities are found in the upper littoral zone of estuaries, just the location humans are likely to walk. This is significant as the snail is the primary host for the human lung fluke. The alternate host is a crustacean. Sexes of the snail can be distinguished because males are about half the size of the females. (See nutshell #18 for more info.) (*Thanks to John Chapman*)

Other Activity in the Pacific Northwest

Mitten Crab Watch Cards. The PSMFC, with funding from the Stockton USFWS, recently reproduced the "Mitten Crab WATCH" card. The card is similar to past versions (2 ¼ x 3 ½ inch in size) and printed on waterproof paper. To order this free card, contact <stephen_phillips@psmfc.org>.

New Pacific Northwest Invasive Species Guide. The new laminated field guide to common aquatic invasive species, *On the Lookout for Aquatic Invaders*, is finally available through OR Sea Grant. It describes species, environmental impacts, distribution, habitat and identification for 31 plants, vertebrates and invertebrates from marine, freshwater and riparian environments, particularly in the Lower Columbia Basin. Developed by Scott Wiedemer and Sam Chan, it was funded by a coalition of seven partners including PSMFC, EPA, the WA and OR Invasive Species councils, and the OR Watershed Enhancement and State Marine Boards. A web version will hopefully be available by fall. Contact: <sea.grant.communications@oregonstate.edu>, or call 541/737-4849, to order copies.

Western Weed Guide. You can now download the pages to the Western US Invasive Plant EDRR Weed ID Guide. Printable pdf's of each chapter of the guide (forbs, shrubs, vines, aquatics, and grasses, as well as an introduction to EDRR), are available at [<http://www.oregon.gov/ODA/PLANT/WEEDS/edrrweedguide.shtml>] (*Thanks to Shannon Brubaker*)

New Freshwater Algae Listserve. The Washington Department of Ecology has set up a new list serve for freshwater algae. The Freshwater Algae Program list serve will act as an information exchange and discussion forum about freshwater algae in WA. To join the list, start a new email and put subscribe ECOLOGY-FRESHWATER-ALGAE-PROGRAM in the body of the message (not the subject), and send the email to <listserv@listserv.wa.gov>. *(Thanks to Kathy Hamel, Ecology)*

Puget Sound Marine Invasive Species Volunteer Monitoring Program (MISM). MISM is a science-based volunteer monitoring program that expands the old green crab monitoring program. Developed and coordinated by Nahkeeta NW, it systematically surveys beaches, docks and marinas for marine invasive and non-native species. The program will provide both a baseline to document the occurrence and distribution of many known non-native species, and act as an early detection system for high-risk invasive species entering WA inland marine waters. In June, MISM trained local volunteers who will focus on 30 invasive species, from Japanese eelgrass to more obscure species such as Tunicates and oyster drills. To-date there have been no comprehensive surveys or mapping of non-native species in Puget Sound and this is an opportunity to participate and learn about the many species invading WA inland waters. To learn more MISM and volunteer monitoring, contact Ann Eissinger at <nnw2@fidalgo.net> and see their website at [www.fidalgo.net/~nahkeeta].

WA/OR Nonindigenous Aquatic Species (NAS) Database Update). The USGS Western Fisheries Research Center has been actively entering aquatic invasive animal data for WA (and OR, if data is within the same publication/reference). Point data for all observations from the 1998 and 2000 Puget Sound Rapid Surveys, the 2001 – 2004 Lower Columbia River Study, and the 2006 Middle Columbia River Surveys have been entered. If you know of additional aquatic NIS data sources, please contact Nancy Elder, <nelder@usgs.gov>. PSU has also been entering plant data for both states, and the USFWS has provided some funding to WDFW to spatially reference any already entered data lacking spatial references. A prototype of the WA page will be ready in August or September, and the stand-alone link for WA should be ready sometime in the early fall. Pam Meacham, <meachpmm@dfw.wa.gov>, is soliciting comments on format, contents, and where the homepage will be housed. For examples of what the final data pages may resemble or contain, see examples from HA at [http://pbin.nbio.gov/NASHI/default.asp] or the Great Lakes [http://www.glerl.noaa.gov/res/Programs/nrais/nas_database.html]. *(Thanks to Nancy Elder.)*

WA Ballast Water Rules. The Ballast Water Work Group (BWWG) continues to draft new permanent ballast water rules. They are expected to replace those currently under WAC 220-77-090 (ballast water management and control - Reporting and sampling requirements) and WAC 220-77-095 (interim ballast water standard approval process). The rules will help implement E2SSB 5923, the Aquatic Invasive Species Act passed in 2007, that revised and added new ballast water management statutes under RCW 77.120. Some of the specific proposed changes to WAC 220-77-090 include: clarifying which vessels are affected and who they must submit reports to, a new subsection on department review of safety exemption claims, including determining if a compliance plan or

alternative strategy are required, and filing a minimum \$500 administrative fee; and a new subsection providing process for assessing civil penalties up to new maximum of \$27,500. Some of the specific proposed changes to WAC 220-77-095 include: a new subsection from splitting former subsection (2) to delete treatment technology evaluation process; a new paragraph identifying a Department of Ecology role in approvals, and other changes. As part of the Washington State rule making process, the Department will hold public hearings on the rule, but has not yet set a firm date. For more information on the rules or the WDFW BWWG, contact <pleusaep@dfw.wa.gov>.

WA Strategic Plan. The Invasive Species Council submitted the state's first statewide invasive species strategic plan, *Invaders at the Gate - The Washington Invasive Species Council Strategic Plan* to the Legislature and Governor on June 5. The plan presents 22 recommendations with specific action items covering the next 20 years. The five priority short-term (3 years) recommendations are: (1). Compile existing information and conduct a baseline assessment of WA invasive species information and programs; (2) Develop a Web-based clearinghouse for statewide interchange of invasive species information; (3) Support targeted outreach campaigns to raise awareness of the potential damage caused by invasive species; (4) Facilitate and improve communication, accessibility of tools, and coordinated approaches across all organizations; and (5) Improve agencies' access to emergency funding and develop an early detection and rapid response network. In fall, the council will sponsor workshops in eastern and western WA, to connect with critical partners and complete the development of a three-year work schedule focusing on implementing the top five recommendations. Detailed information about the workshops will be available in the near future on the council's Web-site at: [www.rco.wa.gov/invasive_species]. (Thanks to Clover Lockhard, RCO)

New OR Publication for Gardeners. A new 54 page publication *GardenSmart Oregon: A Guide to Non-invasive Plants*, identifies more than 25 invasive plants threatening natural areas across OR and recommends non-invasive alternative plants that can be safely planted in the garden. It contains dozens of photos and offers tips to help gardeners select non-invasive replacement plants adapted to local conditions. The booklet was created by OR State University Extension Service, OR Association of Nurseries, City of Portland, The Nature Conservancy, Clackamas Community College and OR Sea Grant, and is a project of *Stop the Invasion*, an unprecedented campaign of Oregonians taking responsibility to protect the lands and waters against invasive species. Download the booklet at [www.opb.org/silentinvasion], or get a mailed copy for \$3 postage and handling at <http://extension.oregonstate.edu/catalog/>.

Revised WA Gardenwise Brochure. The WA Noxious Weed Board publication *Gardenwise: non-invasive plants for your garden*, that provides gardeners with alternative planting choices to replace notorious "bad" garden plants, has been redesigned. Now there are two versions, one for Western WA (wetter climate) and one for Eastern WA (more arid areas). Both versions are now online, at: [http://www.invasivespeciescoalition.org/GardenPlants/Garden%20Wise].

New ID Legislation. The Idaho Invasive Species Act of 2008 is now law. It contains provisions allowing the state to determine what is invasive and develop a state species listing, set up mandatory inspection and decontamination stations for boats, and establishes a \$5 million emergency response fund. Two rulemaking pieces are also underway: rulemaking to implement the new act, and a reopening of the deleterious animal rule. The western zebra mussel threat was the main driver for this legislation. *(Thanks to Amy Ferriter, IDA)*

OR Wildflower Seed Law. Last year Nutshell reported on a UW study of wildflower seed packets, in which all of the 19 packets studied contained invasive weed seeds, including some that were listed as noxious weeds in at least one state or Canadian province. Now a new OR law will help the state better regulate the bag contents to prevent the spread of noxious weeds. The OR Department of Agriculture (ODA) can now pull weed-containing wildflower bags from shelves and require accurate seed lists on bags, and it also plans to randomly select wildflower packets and send them to the OSU seed lab for identification. Gardeners are asked to help keep weeds out of wildflower seed bags by comparing the package contents to the state noxious weed list, and notifying ODA if a noxious weed or other prohibited seed sprouts. Gardeners should also retain the package until the flowers sprout, because officials will need the wildflower seed bag to follow up with the manufacturer. *(From May 26 Statesman Journal, <bcasper@StatesmanJournal.com>.*

WA Noxious Weed Permit (Update). The new aquatic noxious weed permit application is up and running online. Find links to the application and instructions for accessing the new system at [http://www.ecy.wa.gov/programs/wq/pesticides/apply_online.html] *(Contact Kelly McLain <kelm461@ecy.wa.gov> for further information.)*

OR PBS Campaign. The OR Public Broadcasting and Salem Statesman Journal have teamed up on a great yearlong campaign to educate citizens on invasive species. Learn more about the campaign and check out the blog, photo gallery and other items, at [<http://www.statesmanjournal.com/apps/pbcs.dll/section?Category=>]

Oregon Biocontrols. To date, ODA has used 71 biocontrol agents against 31 weed species. About one out of every three has proven successful. Positive results range from the battle against tansy ragwort in the 1980s to the more recent success stories involving purple loosestrife and diffuse knapweed. *(From Tuesday, May 27, 2008 Bruce Pokarney article in the Hillsboro Argus)*

Western Invasives Network and Database Now Online. The Western Invasives Network (WIN) has been designed to promote and enhance the identification and management of invasive plant species in the Pacific Northwest. It was originally designed as a tool to disseminate information related to problem invaders threatening the six Cooperative Weed Management Areas (CWMAs) of the Northwest Weed Management Partnership (NWMP). The invasive species database features invasive plants flagged for early detection in each CWMA. WIN aims to provide a conduit for promoting communication and dialogue between all citizens and organizations concerned with invasive species

management and policy, via an online forum and news and events pages. In the future, most, if not all, information concerning the NWMP will be disseminated through WIN. Check out the network at [<http://www.westerninvasivesnetwork.org>] and sign up for the forum so you can start sharing as well. The Network is also looking for CWMA and working group members to serve as forum moderators. If you are interested in participating, contact Sam Leininger <sam@mycrocosm.com>, Vern Holm <vgholm1@verizon.net>, or Tania Siemens <Tania.Siemens@oregonstate.edu>.

WA Wilderness Hay and Mulch (WWHAM) Pilot Program (Update) Effective January 1, 2007, commercially processed feed pellets and/or certified weed-free straw and feed are now required within all wilderness areas and adjacent trailheads in PNW National Forests. On January 1, 2009, this requirement will be in effect for all US Forest Service lands. The WA State Noxious Weed Control Board (WSNWCB) has been working with county weed boards, the Washington Hay Growers Association, and the Back Country Horsemen to implement a voluntary, pilot program to certify hay and straw. It is called Washington Wilderness Hay and Mulch (WWHAM) program, and it is North American Weed Management Association (NAWMA) approved. Things are moving forward with the WWHAM Pilot Program this growing season. Several fields in Western and Eastern Washington have now been certified and baled. The WSNWCB will post contact information for participating growers and retailers of WWHAM-certified products information on its website. For more information on the program, see the Frequently Asked Questions (FAQ) sheet on the website at www.nwcb.wa.gov. To purchase WHAMM products, or for more information on the program, contact noxiousweeds@agr.gov. (Thanks to Danielle Warner, <DWarner@agr.wa.gov>).

WA 2008 Watch List. The WA Aquatic Nuisance Committee (ANS) has finalized the 2008 ANS Watch List. The latest version (5/8/08) will be available online at [www.dfw.wa.gov] after formal adoption by the entire Committee. The main changes appear to be removal of regulated species from the list.

2009 WA Noxious Weed List. New species proposed for the 2009 Washington Noxious Weed List include shiny geranium (*Geranium lucidum*), false brome (*Brachypodium sylvaticum*), and flowering rush (*Butomus umbellatus*) (Class A); Himalayan blackberry (*Rubus armeniacus*), evergreen blackberry (*Rubus laciniatus*), English holly (*Ilex aquifolium*), European mountain ash (*Sorbus aucuparia*), and cherry laurel (*Prunus laurocerasus*) (Class C). There are also proposals to change county designations for some Class B species and to change classes of already listed noxious weeds.

Western Regional Panel. The 2008 meeting of the WRP will be held **September 9-11** in Fort Collins, CO. In addition to usual business and grant reviews, there will be a field trip to see a brook trout removal and visit the USGS lab. (For more info, contact Tina Proctor, <bettina_proctor@fws.gov>.)

Activity Elsewhere

New Invasion Bill. LHR 6311- Nonnative Wildlife Invasion Prevention Act - was introduced and referred to the House Committee on Natural Resources on June 19, 2008. The bill charges the USFWS with the responsibility of creating a risk assessment process for all nonnative animals proposed for importation into the US. It also directs the Service to develop a List of Approved Species and a List of Unapproved Species. For more information, go to: [<http://www.govtrack.us/congress/bill.xpd?bill=h110-6311>]. (*Thanks to Kevin Anderson, via Jeff Adams.*)

Shellfish Invasive Presentations. To access the presentations from the "National Symposium on Shellfish and the Environment", held in Warwick, Rhode Island, on June 9-10, 2008, go to [<http://aquaculture.noaa.gov/news/shellfishsymposium.html>].

Vertebrate Symposium Presentations. Proceedings of the Managing Vertebrate Invasive Species Symposium are now available and can be found at [http://www.aphis.usda.gov/wildlife_damage/nwrc/symposia/invasive_symposium/nwrc_TOC_index.shtml] (*Thanks to Kevin Aitkin, USFWS*)

Trade-Related Economic Report. The Economic Research Service of the USDA has released a new report, *Policy and risk processes of trade-related biological invasions*. It summarizes the methodologies, results and empirical insights of research on nonindigenous species introduction risk. This research highlights the welfare and biological implications of both broad policy instruments (such as tariffs) and differentiated policy instruments (such as inspections), and the challenge of empirically supporting the latter. To download a copy of the report, go to [<http://www.ers.usda.gov/Publications/CCR41/>]. (*Thanks to Kevin Aitkin*)

EPA Ballast Water Permits. (Update). As a result of a court ruling currently under appeal, vessel owners or operators whose discharges have previously been exempt from Clean Water Act requirements will require a permit as of September 30, 2008. On June 16, EPA formally announced two proposed NPDES general permits in the Federal Register. The permits, fact sheets, and economic analyses can be found at: [www.epa.gov/NPDES/vessels]. As many as 91,000 commercial vessels and 13 million recreational boats could possibly be affected. EPA is proposing control technologies and management practices that enhance environmental protection and are practical to implement. The commercial and large recreational Vessel General Permit (VGP) would cover all commercial vessels and recreational vessels 79 feet or longer. For vessels that carry ballast water, it would incorporate the Coast Guard mandatory ballast water management and exchange standards, and have supplemental ballast water requirements. The VGP would provide technology-based and water-quality-based effluent limits for other types of discharges including deck runoff, bilge water, and gray water. The permit also establishes specific corrective actions, inspections, monitoring requirements, recordkeeping and reporting requirements. Only a subset of the vessels potentially

affected by this permit will have to submit a Notice of Intent for coverage; for all the other vessels, coverage would be automatic.

The permit for smaller recreational vessels less than 79 feet long contains simpler provisions. These smaller vessels would need to comply with new and established best management practices. In addition, they would not be required to submit a Notice of Intent for coverage under the permit; their coverage would be automatic. The EPA comments period is 45 days. EPA also held public meetings and hearings in Washington, DC, Portland, OR, and Chicago, IL and a public Webcast meeting will be held **July 21**. For information on the permits and meetings, or to submit comments, go to: [<http://www.epa.gov/npdes/vesselsInstructions>] or submit comments directly to the EPA Docket at [<http://www.epa.gov/edocket>]. See a full video of the June 12 hearing at: [<http://transportation.house.gov/hearings/hearingDetail.aspx?NewsID=666>]. Documents related to the rulemaking petition and the Court's ruling are available on-line at: [http://www.epa.gov/owow/invasive_species/ballast_water.html]. (*Thanks to John Lishman, EPA*)

Final Report: Invasive Species and the Clean Water Act. (Update) The Environmental Law Institute (ELI) report on invasive species and the Clean Water Act, *The Role of Aquatic Invasive Species in state Listing of Impaired Waters and the TMDL Program: 7 Case Studies*, is now finally available. Case studies are from CA, FL, IA, MA, NY, OH and WA . Go to [http://www.elistore.org/reports_detail.asp?ID=11298] to download the free report. (*Thanks to Adam Schlempp, ELI*)

Final Report: ELI/EPA Climate Change and Invasives. (Update) ELI has also finalized “*Effects of Climate Change on Aquatic Invasive Species and Implications for Management and Research*”, prepared by ELI and USEPA. The report examines the effects of climate change on aquatic invasive species; identifies gaps in scientific information, and proposes strategies for incorporating climate change considerations into future management plans and activities. The report indicates that few state management plans (with notable exceptions of WA, HI and AK) currently take changing climate conditions into consideration because there is no current mandate to do so, (although states have the ability to update and adapt their plans to consider the impact of climate change). The report also identifies five practical steps managers can implement to minimize the effects of climate change: (1) Incorporate climate-change considerations into state invasive species activities; (2) Identify emerging aquatic invasive species threats resulting from climate change; (3) Identify ecosystem vulnerabilities and improve methods to increase ecosystem resilience; (4) Evaluate the efficacy of control mechanisms under changing conditions; and (5) Manage information systems to include considerations of changing conditions. *Obtain a free e- copy of the report at* [http://www.eli.org/Program_Areas/land_biodiversity_pubs.cfm#invasive].

Ballast-Free Ship Design. University of MI researchers are investigating a radical new design for cargo ships that would eliminate ballast tanks and offer a promising alternative that could block hitchhiking organisms while eliminating the need for expensive sterilization equipment. Instead of hauling biologically contaminated water across the

ocean, the ship would create a constant flow of local seawater through a network of large pipes running below the waterline, allowing the boat to be continually filled with local sea water. The ballast-free ship concept was conceived in 2001, patented in 2004, and is intended for new-vessel construction only. Michael Parsons, co-leader of the project, feels the ballast-free ship has the potential to be an economic winner, and says the design may provide as much as 7.3% savings in the power needed to propel the ship. For a 650-foot bulk carrier hauling 32,000 metric tons of cargo from the Great Lakes to Europe and back, that translates into a roundtrip fuel savings of roughly \$150,000. A report on the latest test results, including their economic implications, was published in April in the Transactions of the Society of Naval Architects and Marine Engineers. With funding from the Great Lakes Maritime Research Institute, Parsons and his colleagues recently built a 16-foot, \$25,000 wooden scale model of an oceangoing bulk carrier to test the concept. The researchers conclude that the new design would result in a net capital-cost savings of about \$540,000 per ship. Combined with the expected fuel savings, total cargo transport costs would be cut by \$2.55 per metric ton. In towing tests, tentatively set for late June, the naval engineers will try to confirm and explain the unexpected power savings. Most of the improvement is likely due to the fact that water expelled from the stern-end of the trunks "smoothes out the flow" into the propeller, allowing it to operate more efficiently, Parsons said. *(Thanks to Captain Keith Strieck, WDFW)*

Asian Carp in the Great Lakes (Update). Recent surveys of the Illinois and Des Plaines Rivers have not revealed any further movement of the Asian carp toward Lake Michigan. Two bighead carp and six silver carp were spotted about 30 river miles from the electric fish barrier that is meant to keep Asian carp from reaching the lake, but this is no closer than fish spotted by previous surveys. Agencies monitor advance of the Asian carp along the rivers toward Lake Michigan by electro-shocking, that temporarily stuns the fish so they rise to the surface. During this year's 13th annual survey, scientists were hoping to capture bighead carp close to the electric fish barrier so they could implant thumb-size ultrasonic transmitters. They plan to place canister-like sensors in the river that will listen for each transmitter's sonic signature, tracking individual carp as they advance toward the fish barrier in the Chicago Sanitary and Ship Canal near Romeoville. *(From the June 20 Chicago News Tribune, thanks to Vacys Saulys EPA R5)*

VHS (Update). A recent fish kill of round gobies near Milwaukee WI, confirmed fears that VHS (viral hemorrhagic septicemia), an Ebola-like virus, would strike closer to Chicago. The virus appeared to have gone largely dormant during the last year, but WI officials last week found it in yellow perch from Lake Michigan. Last month's goby die-off was the first time the virus has been found in the southern part of Lake Michigan. Then Ohio officials announced they had also discovered the virus in muskie caught in the central part of the state, the first time this strain was found outside the Great Lakes basin. Like the round goby, VHS is also an invasive species. It tends to be more destructive and pervasive in the U.S. than in the lakes and rivers of Europe where it originated, but it is difficult to predict long term effects. Unlike diseases that tend to affect one or two types of fish, this viral strain has led to large fish kills of more than 30 species, including salmon, trout, walleye, muskie, bass, perch and other valuable sport fish. It does not threaten human health, but could be devastating to the \$4 billion commercial and sport

fishing industry in the Great Lakes. VHS virus tends to thrive in water between 30 and 60 degrees, but is apparently hearty enough to survive in the cold waters of the Great Lakes for up to 14 days, and has even been found in frozen bait.. (*From a June 30th Chicago Tribune article by Michael Hawthorne.*)

AU Online Weed Identification Tool. Brisbane City Council, in Queensland, Australia, has completed a new online weed identification tool, designed to help residents identify potential weeds in their gardens. Currently it contains all of the species declared by the State and by Council, and it will be adding species over time. There are also links to a discussion forum and an online user survey for feedback on using the tool. Check out the tool at: [http://www.brisbane.qld.gov.au/BCC:BASE:2019129376:pc=PC_2519]. The Australian Weeds Council also has a tool at: [<http://www.weeds.org.au>]. (*Thanks to Dorean Erhart, <dorean@dodo.com.au>, via Jim Gores*)

Australian Report - Climate Change and Invasive Species. Australia has released *Climate Change and Invasive Species: review of interactions*. The 32 page report summarizes results of a workshop held in November, 2006. To obtain a copy, go [<http://www.environment.gov.au/biodiversity/publications/pubs/interactions-cc-invasive.pdf>]. (*Thanks to Helmut Rogg, ODA.*)

Invasive Snails Impact Native Ducks. Invasive snails and parasites are attacking lesser scaup and other ducks on the Upper Mississippi River. With no natural predators, the snails and the parasites are thriving, and the snail has helped kill nearly 50,000 ducks in the last few years in the Upper Mississippi Wildlife Refuge. Three types of invasive intestinal parasites are killing the birds, and all three use the mud byfnia, or faucet snail, as an intermediate host. The lesser scaup duck is particularly susceptible to this parasite, and is killed in only a few days. The snail and the parasites have been found as far south as Dubuque, IA, near another bird hot spot. Biologists have tried 15 poisons on the snails without success. They are currently redesigning islands on the river in an attempt to make them less hospitable to the snails, and hoping the ducks can develop a resistance to the parasites that live in the snails. (*From an NPR News Summary by Sea Stachura, May 26.*)

Britain Launches Invasive Species Strategy. Rising global temperatures are fuelling the growth of invasive foreign plants and animals in Britain. Spread of these non indigenous species costs the economy between £2 and £6 billion a year. The cost of removing Japanese knotweed, alone, is estimated to be £1.56 billion (so far). The Department for Environment, Food and Rural Affairs (DEFRA) has launched a strategy to combat the problem and raise public awareness, and plans to develop a rapid response plan to control invasive species. The project will affect England, Scotland and Wales, and includes an online directory of where the foreign plants and animals can be found and how they spread. Two thirds of the more than 3,000 foreign species in Britain are plants. Other problem species include floating pennywort, Chinese mitten crab, North American signal crayfish, American Azolla fern, gray squirrel, and mink, the Spanish bluebell, and South Africa Hottentot Fig. (*From May 28 UK Telegraph article, Thanks to Jan Haertel*)

Grants Available

RFP for Aquatic Invasive Species Vector Risk Assessments. The CA Ocean Protection Council recently authorized \$1 million in funding to conduct risk assessments for six vectors of aquatic invasive species into CA coastal and estuarine waters. The project will help to achieve one of the top priorities identified in the recently adopted state Aquatic Invasive Species Management Plan. The six highest priority vectors for risk assessments have been identified as commercial fishing; recreational boating; live bait; live imported seafood; aquariums and aquascaping (including marine bio-supply companies and internet trade); and aquaculture. Information provided by this project will support the development of new management programs. Proposals having a budget of between \$50,000 and \$150,000 will be considered. The submission deadline is **July 14, 2008**. A subsequent RFP will be released to produce an additional final report to synthesize the information from the individual risk assessments to identify the most risky vectors and recommend potential management actions. For more information on the project, go to [http://www.resources.ca.gov/copc/05-15-8_meeting/04_AIS/0805COPC04_AIS%20Amended.pdf] (*Thanks to Abe Doherty, <adoherty@scc.ca.gov>*)

WRP Grant Proposals Solicited. The Western Regional Panel (WRP) requests proposals for projects to address WRP high priority aquatic nuisance species issues. A total of \$30,000 is available to fund one to three projects, and the WRP encourages projects in the \$10,000 to \$15,000 range. Projects that use the funds as “seed money” for larger scale projects or have matching funds available, are strongly encouraged. WRP funding covers overhead costs of up to 15 percent, and projects must be completed within 2 years of the award date in October, 2008. Individuals in federal, state, provincial or local agencies, institutions of higher education, commercial or non-profit organizations, Tribes, and international organizations are eligible for funding as investigators or cooperators. Canadian applicants must have U.S. partners. No matching funds or cost sharing arrangements are required, although these are desirable. Applicants must discuss funding proposals with and gain written support and approval from their respective WRP state or provincial representative. Proposals are due by 5:00 pm, **August 8, 2008**. Send proposals to Eileen Ryce at <ERYce@mt.gov>. For more information about the WRP and its priorities, go to [<http://answest.fws.gov/>].

Conferences & Symposia

International Aquatic Invasive Species Conference. The 16th international conference will be held on April 19-23, 2009, in Montreal, Quebec, Canada. Abstracts for presentations and posters may be submitted until **August 1, 2008**. Early registration is available at a reduced rate (save \$50) until February 1, 2009. Submit abstracts (500 words maximum) to <Elizabeth@theprofessionaledge.com>, and be sure to include complete contact information for all co-authors (full name, organization they represent,

postal address, e-mail address and telephone number). Go to [<http://icias.org>] for registration forms and other information.

Natural Areas Conference. The focus of this year's national Natural Areas Conference will be on ecological management themes with an emphasis on invasive exotic species issues. The conference consists of four full days of symposia, workshops, field trips and plenary sessions, and will be held **October 14-17**, in Nashville, TN. For information on: sponsorships, registration, call for papers, program schedule and more, go to [<http://www.naturalarea.org/2008ConferenceAnnouncement.asp>].<http://www.naturalarea.org/>]. (*Thanks to Deb Kraus, via Randy Henry, OSMB*)

OWEB Watersheds and Climate Change Conference. The effects of climate change on watersheds will be a major focus of the 2008 OR Watershed Enhancement Board Conference **Nov. 5-7**, in Eugene, OR. The event also will feature concentrated workshop series on invasive species, organization management, community engagement and restoration project management. For more information, call 503-986-0178 or visit: [www.oregon.gov/OWEB]. (*Thanks to Shannon Brubaker, ODA*)

This Quarter's Off-The-Wall News

Invasive Fish Blamed For Reptile Deaths. Invasive fish carrying industrial chemicals in their bodies may have caused the recent deaths of 110 critically endangered crocodile-like reptiles, known as gharials, in central India. Between last December and March, bodies of over 100 gharials washed ashore along the banks of the Chambal River, one of the few unpolluted rivers in India. Autopsies revealed the gharials died from gout, caused by chemical-laced lesions on the animals' kidneys. Researchers suggested a possible link to the growing abundance of tilapia, a cichlid fish from Africa. They suggest that tissues in tilapia contained ingested chemicals, and the fish moving from polluted rivers into the Chambal, were then eaten by the gharials. Subsequent cold winter temperatures precipitated the uric acid and began causing problems in the gharials. Winter, coupled with excess food, could have made the gharials more susceptible to the toxin. (*From March 14, International Animal Rescue, thanks to Kevin Aitkin, USFWS*)

Crazy Ants in Texas. Crazy ants, *Paratrechina pubens*, so-named because they wander erratically instead of marching in regimented lines, apparently arrived in Houston, TX, via a cargo ship. With warmer weather, they are emerging by the billions, and they appear resistant to over-the-counter ant killers. For reasons not well understood, the ants are attracted to electrical equipment; they short-out electrical boxes, and cause computers, gas meters, pumping stations, and fire alarms to malfunction. The ants also feed on beneficial insects, and even eat the hatchlings of the Attwater prairie chicken, an endangered grouse. Extermination is difficult: each colony has multiple queens, and the ants don't usually take bait. On the positive side, they eat fire ants, another more established, and feared invader. When the ants are killed, the survivors are known to pile up the dead, using them as a bridge to cross safely over surfaces treated with pesticide. (*From May 14 AP article by Linda Stewart Ball. Thanks to Dan Hilburn, ODA*)

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