AQUATIC NUISANCE SPECIES COMMITTEE
REPORT TO THE
2004 WASHINGTON STATE LEGISLATURE

Prepared by the Aquatic Nuisance Species Committee
chaired by
Scott S. Smith, Washington Department of Fish and Wildlife

December 2003

TABLE OF CONTENTS

INTRODUCTION

The 2000 Washington State Legislature created the Aquatic Nuisance Species (ANS) Committee (RCW 77.60.130) to coordinate the implementation of programs that minimize the impact of invasive aquatic species. (See attached list of committee members.) The Committee organizes the management efforts of many state and federal agencies through the Washington State ANS Management Plan. More than 200 representatives from various agencies, local governments, tribes, and industries are invited to participate in the semi-annual meetings. Seven working subcommittees have been created to address various topical issues including: Imports and Transfers; ANS and Salmon; Education, Research and Risk Assessment; Monitoring and Response Plans; Commercial Shipping; Recreational Boating; and Regulatory Review. The full Committee meets twice per year, and the executive committee conducts monthly conference calls to address issues that require immediate attention and to prepare items for review by the full Committee.

The legislation that established the Committee requires a biennial report to the Legislature with the second report due by December 1, 2003. The purpose of this report is to fulfill this requirement by reporting to the Legislature the Committee's accomplishments and making recommendations for better accomplishing the Committee's purpose.

RECOMMENDATIONS TO BETTER ACCOMPLISH THE COMMITTEE'S PURPOSE

The following recommendations have broad consensus from the Committee members.

1. Provide stable, long-term dedicated state funding to implement core Aquatic Nuisance Species (ANS) management programs including prevention, screening, control, monitoring, education, research, and rapid response. Fee programs on industries that are pathways for the introduction of aquatic invasive species should be considered.

2. Washington State is at an increasing level of risk for a zebra mussel introduction. The ANS Committee supports the recommendations contained in the Washington Department of Fish and Wildlife and Washington State Patrol report to the Legislature that recommends actions to reduce the risk of a zebra mussel or other aquatic invasive species introduction from recreational boating.

    - Add dedicated staff to inspect watercraft at port-of-entry weigh stations.
    - Set-up check stations to inspect watercraft at areas of high boating activity.
    - Implement a boater education program.
    - Build the capacity for enforcement officers to randomly inspect boats.

3. Enhance existing and create new monitoring and control programs.

    - Continue efforts to monitor for European green crab.
    - Continue efforts to control and monitor for Spartina.
    - Encourage efforts to develop monitoring for new nonnative species introductions, such as the "Puget Sound Expeditions" and the Exotic Species Detection Program Plan for Puget Sound.
    - Continue efforts to monitor Washington waters for the presence of zebra mussels.
    - Continue efforts to monitor and control aquatic invasive plants.
    - Develop cooperative monitoring programs for Chinese mitten crab in the Puget Sound Basin and the Columbia River.

4. The ANS Committee supports the ballast water management efforts made by Washington State to further reduce the risk of new invasive species introductions. The Committee recognizes the complexity surrounding the issue of ballast management and encourages the Washington Ballast Water Work Group to continue their efforts to complete a report to the Legislature. The Committee report should summarize the status of emerging international and national ballast management efforts and offer recommendations that better coordinate our state program with regional efforts. The report should offer specific recommendations

to implement a performance based ballast management program that improves the combined effectiveness of state, national and international programs to prevent the introduction of invasive species.

National and international ballast management efforts are proceeding. Washington State should continue efforts that reduce the risk of invasive species introductions in cooperation with the U.S. Coast Guard and the International Maritime Organization. New introductions into our marine ecosystems are often irreversible with economic and environmental impacts that must be born by today's citizens and future generations. Delays could result in new introductions of invasive species that impact our aquaculture, fisheries (including salmon recovery), power generation, utilities, recreation, or other industries that rely upon our aquatic resources.

5. Utilize a science-based program to maximize the responsible use of beneficial nonnative species and minimize the impact of invasive nonnative species.

   - Develop and implement a program to screen out potentially invasive plants and animals prior to importation, sale, or release into state waters.
   - Develop criteria for evaluating, classifying, and quantifying the extent of ANS risk.
   - Collate data and develop maps and reports summarizing the known distribution of ANS.
   - Track distribution patterns to determine areas and industries at risk of impacts of future invasions.

6. Enhance and develop public education outreach programs.

   - Develop inserts about ANS to be distributed with boating guides, fisheries regulations, fishing license renewals, and boat tax statements.
   - Make assessment programs materials available to agency staff and citizens to be used in identification of ANS.
   - Develop display materials directed at restaurants, fish markets, and bait shops describing how to properly handle nonnative species to prevent unintentional introductions.
   - Develop display materials directed at pet/aquarium stores to increase awareness of pet buyers and prevent unintentional introductions.

ACCOMPLISHMENTS

The "Washington State ANS Management Plan" serves as a work plan and qualifies the state for National Invasive Species Act (NISA) funding through the U.S. Fish and Wildlife Service. As more state plans are approved, the funding available for each state is reduced. The Washington Department of Fish and Wildlife received $100,000 in FY2002, and $62,800 in FY 2003 to fund coordination and implementation of the state plan. One of the primary goals of the Committee is to encourage collaboration between federal, state, and local entities working on ANS issues. The following accomplishments are part of this comprehensive statewide coordination effort.

- The Puget Sound Action Team is working with British Columbia to prepare a three to five-year action plan to evaluate non-indigenous species in shared waters for the Puget Sound/Georgia Basin International Task force. The plan includes conducting a risk assessment, developing a rapid response plan for British Columbia, and identifying and taking action on non-ballast water pathways of introduction.

- The Action Team has contracted with the San Francisco Estuary Institute to develop plans and estimate costs for the monitoring effort to detect new or previously unreported exotic organisms in Puget Sound, the lower Columbia River, and Tillamook Bay national estuaries. The design criteria includes developing a baseline database, sampling protocols, and taxonomic information support. The contract will produce a plan and estimate costs for an ANS monitoring program to detect new or previously unreported exotic organisms in Puget Sound. A preliminary plan is available, and the finalized plan should be available by March 2004.

- The Action Team also contracted with Washington Sea Grant to train SCUBA divers to identify and report invasive marine species, and to set up an Internet reporting system. In cooperation with the Washington Department of Fish and Wildlife, the Action Team contracted with the Korean Women's Association and the Indochinese Cultural and Service Center to develop educational brochures on invasive species in Cambodian, Laotian, Vietnamese, Korean, Samoan, and Filipino.

- The 2003-2005 Puget Sound Water Quality Work Plan includes proviso funding specifically tagged to support ongoing green crab monitoring in the Puget Sound basin over the next two years.

- The Washington Department of Ecology is evaluating the effectiveness of several aquatic herbicides for the control/eradication of Eurasian water milfoil and Brazilian elodea in several test lakes. Herbicides are often needed to control widespread infestations of invasive plants. The new National Pollution Discharge Elimination System (NPDES) permits required for aquatic plant control using herbicides allows Washington to collect monitoring data, including herbicide residues, water quality

impacts, and treatment efficacy data. This information is posted on Ecology's web site. Ecology has also funded a seawater challenge test using coho salmon and the aquatic herbicides triclopyr, fluridone, and diquat. All of the salmon survived the challenge and appear healthy. Other endpoint data is being analyzed. The University of Washington plans to publish the results in a peer-reviewed journal.

- The Washington Department of Ecology maintains a web site containing technical and non-technical information about ANS weeds, and has developed brochures and flyers on several exotic freshwater species. The department spent over $1 million on aquatic freshwater nonnative weed management and monitoring over the last biennium.

- Under the Washington Department of Ecology's financial assistance program, great progress has been made controlling/eradicating Eurasian water milfoil in 24 Washington lakes through efforts of the agency and residents living around the lakes. Evaluation of a biological control agent (a weevil) for Eurasian water milfoil continues at a test lake. Ecology staff are rearing and stocking native milfoil weevils into this test site. Ecology and King County have revised their hydrilla eradication strategy to include diver and snorkeling surveys, hand pulling, and fluridone applications. Hand pulling efforts alone were not enough to ensure eradication and the state is committed to eradicating the plant. The department, in cooperation with the Washington Department of Agriculture, is also funding a statewide survey and genotyping of Phragmites (common reed) populations. While there are a few areas where the native genotype is present, the non-native genotype appears to be rapidly invading many wetland areas.

- The Washington State Noxious Weed Control Board, in cooperation with other agencies, local government, and private landowners, has seen very significant reductions in purple loosestrife infestations over the past two years. The reductions have resulted from the introduction of Galerucella calmariensis beetles as a biological control agent, beginning in 1992. The beetles have been so successful that the original release areas now serve as collection points for insects to be released into other areas. Unfortunately, in some areas apparently non-native genotypes of Phragmites have replaced the loosestrife. In FY2001 the Washington State Noxious Weed Control Board listed non-native Phragmites as Class C Noxious Weeds, allowing some entities to initiate control programs.

- The Washington Department of Natural Resources (DNR) has been involved with Japanese knotweed control in the Stillaguamish River watershed and has funded milfoil control and other submerged noxious weed control work in Clark and Thurston Counties. The department is becoming more and more involved with and is funding ANS control work, other than Spartina, on state lands. DNR is one of several agencies and entities working with the Department of Agriculture on the statewide effort to

control/eradicate Spartina. The department is taking another set of aerial infrared photographs of Willapa Bay, which will be used to monitor population change over a nine-year period. This will be the fourth set of photographs since 1994. The photographs will also be used to create a GIS layer of the Spartina in Willapa Bay for use by DNR and other agencies for planning, modeling, and control purposes.

- The Washington Department of Agriculture worked collaboratively with partner agencies to update and implement five regional Spartina management plans. Partnering with federal and state agencies, local governments, tribes, and commercial landowners they treated approximately 2260 solid acres of Spartina in Puget Sound, Grays Harbor, and Willapa Bay in 2002. Progress in 2002 was considerably impacted by the setbacks in 2001. Due to the Ninth Circuit Court decision against the Talent Irrigation District, NPDES permits are now required for the applications of aquatic herbicides. Since no such permits had been developed in Washington, treatment options in 2001 were limited to mechanical crushing and hand pulling.

  An unprecedented amount of control work was carried out in 2003. An estimated 6,000 solid acres of Spartina, approximately 70% of the infestation, was treated in Willapa Bay by WSDA, WDFW, DNR and USFWS. More acreage was treated during the 2003 season than the past six years combined. In Puget Sound, an estimated 694 solid acres of Spartina, approximately 90% of the infestation, was treated.

  This tremendous effort was a result of the increased level of funding provided to WSDA for the 01-03 biennium and increased cooperation of WSDA, other state agencies, universities, the U.S. Fish and Wildlife Service, counties, tribes, private organizations and private land owners. Also important were the continuing efforts to investigate new tools and improve the effectiveness of current tools to eradicate Spartina.

- The coastal green crab monitoring and control program was initiated in 1998 in Willapa Bay and Grays Harbor to control a newly established population. Over 1,100 crabs have been removed from Willapa Bay and Grays Harbor over the last two and a half years. Of those, 320 have been female crabs representing a potential generation of 80-160 million eggs per season. As of June 2003, the coastal program has been altered to a volunteer monitoring and control activity and is administered from the Nahcotta lab.

- The Puget Sound green crab monitoring and control program is ongoing. Volunteers from numerous organizations, under the direction of Washington Department of Fish and Wildlife in collaboration with a nonprofit environmental group, continue to monitor over 100 sites for the presence of green crab. To date none have been found.

- Washington Department of Fish and Wildlife[1] staff organize volunteers to conduct zebra mussel monitoring, distribute sampling supplies, collect water samples and send them for analyses, and maintain a database of the volunteers and the sites monitored. In addition, the department coordinates with Portland State University Center for Lakes and Reservoirs, to implement a regional substrate-monitoring program. There are now more than 70 volunteers checking substrates across the state and reporting their findings to the center.

- Washington Department of Fish and Wildlife[1] contracted with the Pacific States Marine Fisheries Commission to conduct surveys of streams and rivers in western Washington for the presence of Atlantic salmon. To date, 40 streams and rivers in 24 systems have been surveyed. One population of Atlantic salmon has been found in Scatter Creek, near a hatchery that rears Atlantic salmon. Three Atlantic salmon fry were found in Cinnabar Creek near another private freshwater aquaculture facility.

- Washington Department of Fish and Wildlife[1] entered into a partnership with the Washington State Patrol to develop and implement an inspection program for commercially hauled boats at ports of entry into the state. Over 100 boats have been inspected. Three vessels with zebra mussels have been identified and were subsequently cleaned. Several others have been cleaned and flushed as a precautionary measure. The U.S. Fish and Wildlife Service contracted with the department to develop a video for training enforcement officers to inspect boats. The State Patrol provided an officer to serve as the instructor in the film. The department and the State Patrol are working together to broaden the boat inspection program to include privately trailered boats. WDFW enforcement officers have received training regarding invasive species and state laws designed to manage them.

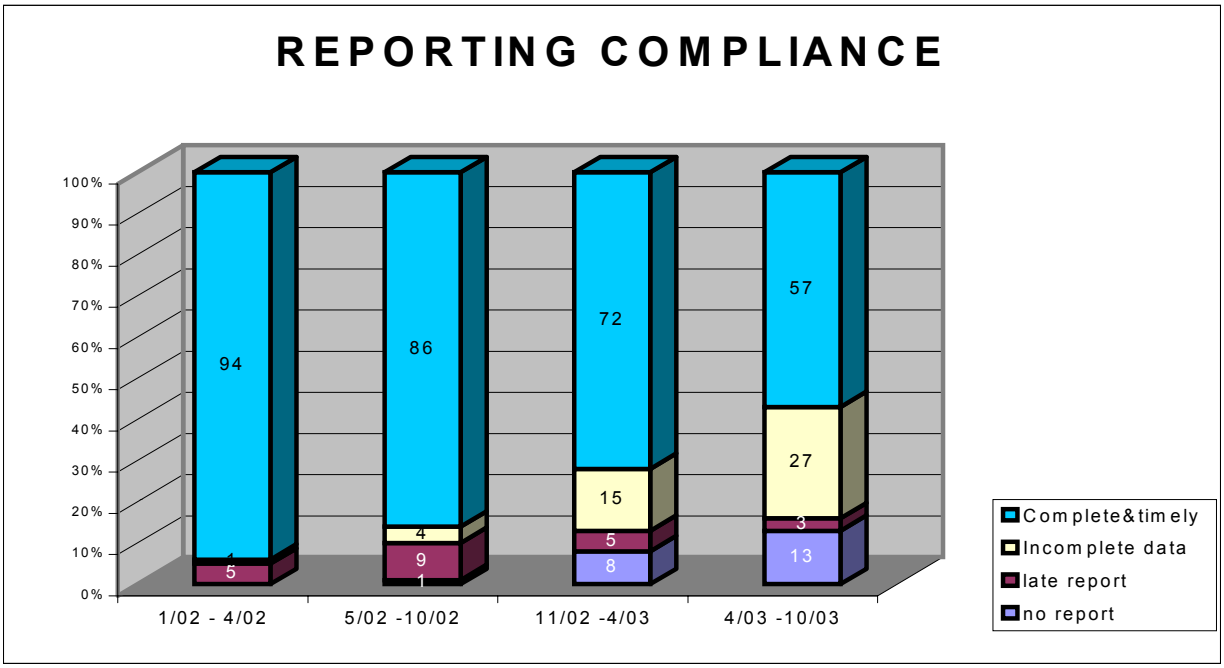
- Washington Department of Fish and Wildlife, in partnership with the Department of Ecology and the Washington State Parks and Recreation, has posted over 650 educational signs at boat launch sites and is continuing to send signs to various county and municipal parks for posting. Colored photographs and descriptions of prohibited invasive species are posted on the web site. The department has worked closely with the pet industry to enlarge the prohibited species list while allowing harmless and/or beneficial species to be imported. Washington Department of Fish and Wildlife[2] has contracted with an environmental consultant to develop rapid response plans for invasive species of concern.

[1] These WDFW efforts, and ballast water management, are directly funded by pass through funds from the U.S. Fish and Wildlife Service.
[2] These WDFW efforts, and ballast water management, are directly funded by pass through funds from the U.S. Fish and Wildlife Service.

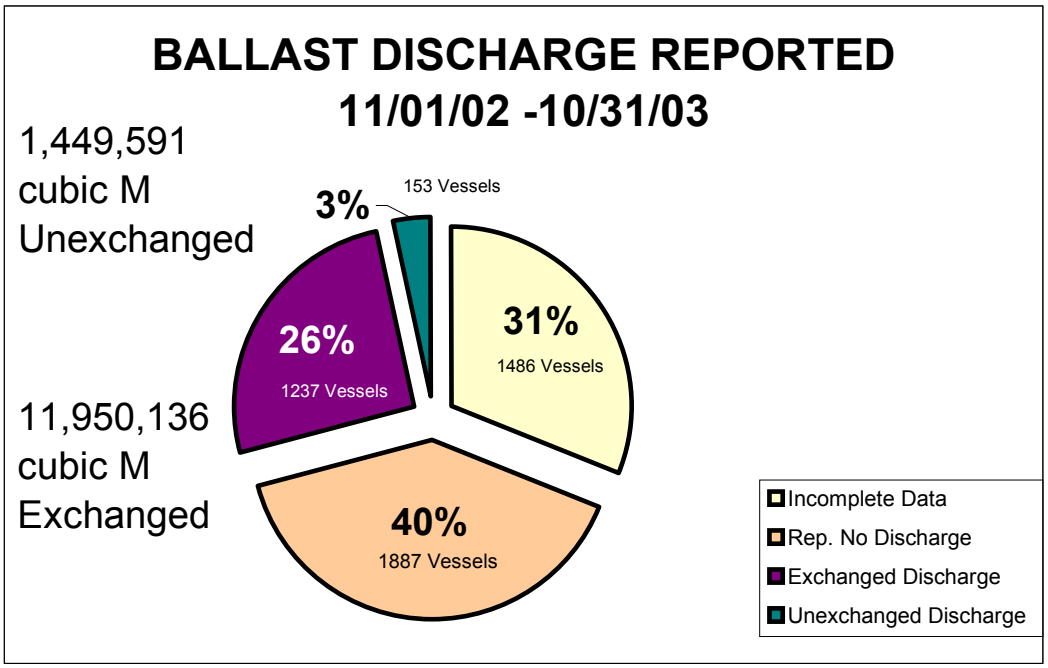
- Washington Department of Fish and Wildlife has given informational presentations and dispersed educational materials on ANS to the recreational boaters associations of Washington and British Columbia, and to Marine Enforcement Officers who are responsible for boater safety education classes.

- Washington Department of Fish and Wildlife is implementing a ballast water management program that enters ballast water reporting data, evaluates ballast exchange compliance, and assesses ballast treatment systems for approval to discharge into Washington State waters.

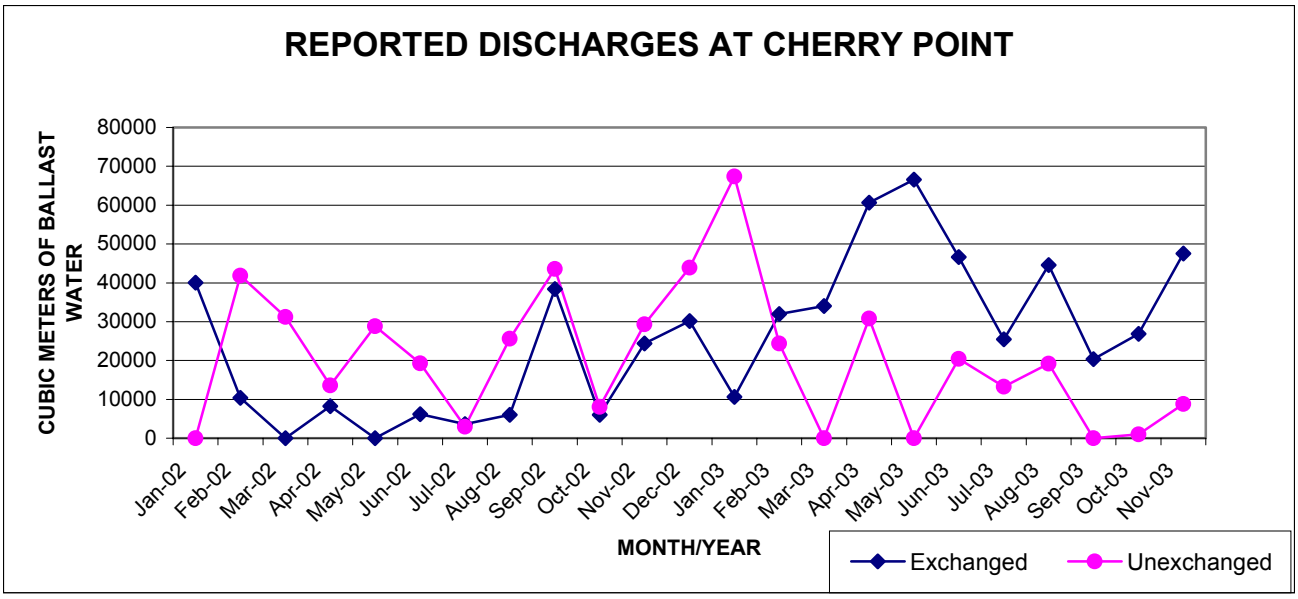
The following chart illustrates how ballast water reporting compliance is declining in Washington State. The ballast water law is written such that Washington Department of Fish and Wildlife (WDFW) cannot fine vessels for not reporting unless they are discharging ballast. WDFW does not have the capacity to verify whether or not a vessel is discharging ballast, which limits the ability to enforce the law. Reductions in staff have also decreased our ability to follow-up with vessel operators and remind them to file complete reports.



This chart shows that significant volumes of high-risk unexchanged ballast (App. 1.4 million cubic meters) were discharged into Washington waters in one year. Almost 12 million cubic meters of exchanged ballast were reported discharged. Over 30% of the ballast reports received were incomplete and the vessels discharge could not be determined. WDFW again lacks clear authority to fine vessels for incomplete reports without proving that the vessel discharged ballast.



The following chart shows the volume of exchanged ballast and unexchanged ballast discharged at the Cherry Point refinery. Prior to January of 2003, discharges of unexchanged ballast were highest. After January of 2003, the volume of exchanged ballast increased and the volume of unexchanged ballast decreased. In December of 2002, Washington Department of Fish and Wildlife staff made presentations to the Cherry Point Herring Work Group calling attention to the large volumes of high-risk unexchanged ballast being discharged into the environmentally sensitive waters around Cherry Point. The chart demonstrates that vessel operators have improved their ballast management practices after being informed of the risk. However, further improvements are needed to adequately reduce the risk of new invasive species introductions into the Cherry Point ecosystem.



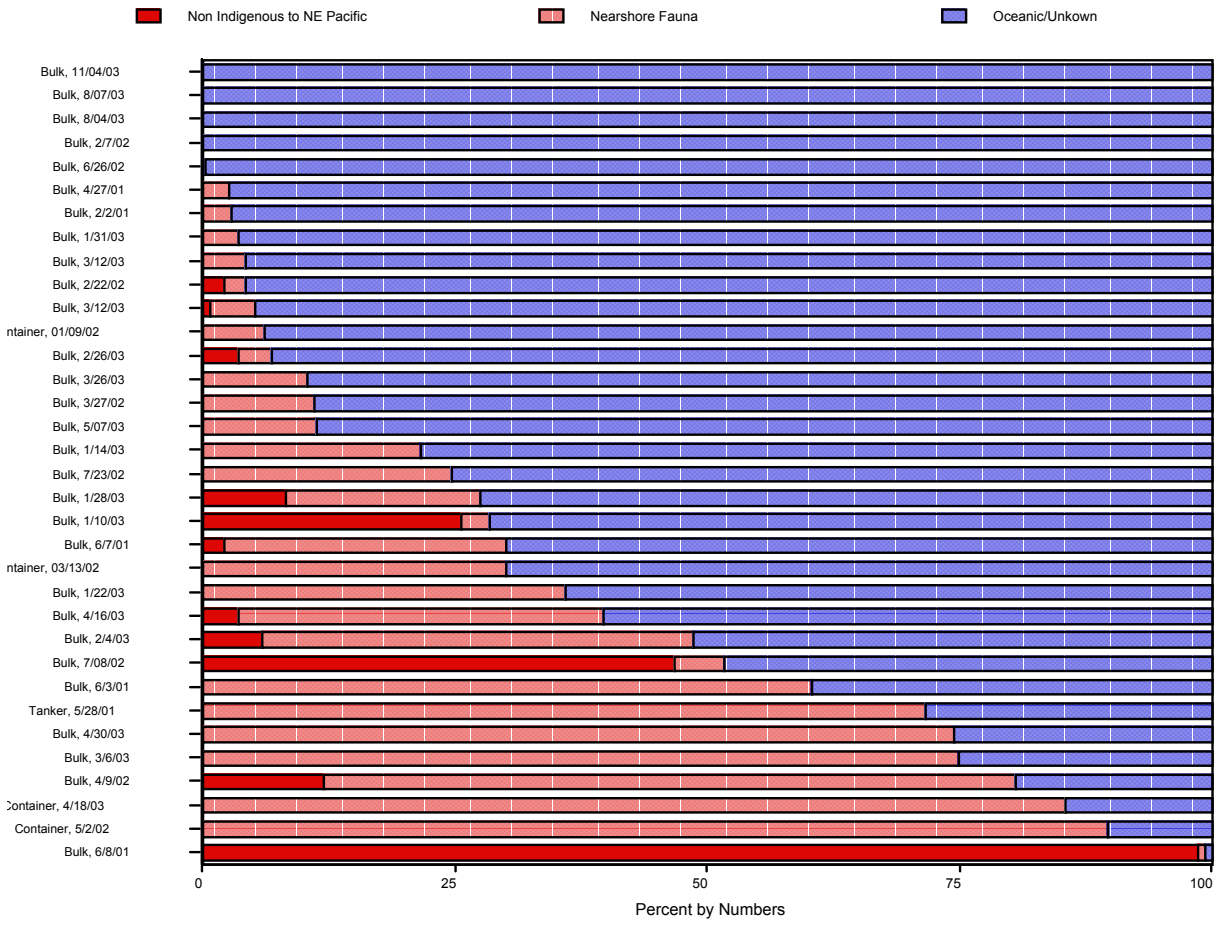
Are vessels accurately reporting ballast discharges? Is the ballast reported as exchanged, properly exchanged? WDFW worked with a graduate student from Duke University to conduct a survey of vessel operators to evaluate ballast discharge practices. The following bullets illustrate the findings of this study.

- Surveyed 81 vessels for compliance
- Chief mates were interviewed, vessel logs were compared to ballast reports, and exchange practices were analyzed
- 24 of 81 vessels discharged improperly exchanged ballast – 20 of the 24 vessels (83%) knowingly violated the law in some way
- The major reason given for violations was the inability of regulators to detect violations. Other reasons included additional work required, and cost of compliance
- 86% of vessel operators would rather treat their ballast than exchange

The University of Washington sampled the ballast water on 34 vessels to look for the presence of coastal or oceanic species in the ballast water. Properly exchanged ballast should contain a very high percentage of oceanic species (Approx. 95%). If passed by Congress, the National Aquatic Invasive Species Act would require vessels to achieve a 95% volumetric exchange. The following chart shows the results of the study. Properly exchanged ballast would show 95% blue on the chart. Approximately 66% of the vessels tested failed to achieve an acceptable exchange. This method of exchange verification could be used to evaluate vessels exchange practices, evaluate risk, and assist vessel operators in determining the practicality of exchange verses treatment for their vessel.

We believe that the Coast Guard and Washington State ballast exchange programs have increased the amount of ballast exchanged, but improvements are needed to further reduce the risk of new introductions.

Coastal and Oceanic Species in Ballast Following Exchange



WDFW has established a standard for the discharge of treated ballast (95% kill or removal of zooplankton and 99% kill or removal of phytoplankton and bacteria). An interim approval process has been established to evaluate ballast treatment methods and approve those that either meet the standard or are considered to be a best available technology. The following three ballast water treatment systems have been approved for use aboard a vessel.

- Norwegian Cruise Lines installed a system that treats wastewater and uses it for ballast. This system was approved for five years.

- ❖ Princess Cruise Lines installed a filtration and UV light system. This system was approved for five years.
- ❖ Mitsui O.S.K. Lines, LTD. installed a ballast treatment system that uses extreme cavitations to kill organisms. This system was approved for further testing.

The results of these on-board trials will determine if approval will be considered for additional installations. Another application has been received requesting interim approval for a ballast water biocide, SeaKleen, which is currently under consideration.

Ballast water treatment is widely considered to be the best solution to prevent new invasive species introductions. More vessels are needed to install treatment systems for testing and approval. Washington law (RCW 77.120) currently requires vessels to treat their ballast, if an exchange cannot be conducted, after July of 2004. Following this date, WDFW will require vessels that cannot exchange to submit a plan for ballast treatment. Any vessel that has a plan and is participating in the interim approval process will not receive a fine. WDFW staff will review the many options for ballast treatment that are available for evaluation in our program with interested vessel operators.

Effective, safe, and economical ballast water treatment systems cannot be fully developed without vessel operators installing these systems for evaluation. The more systems are installed and tested, the faster the systems will improve and the lower the prices will become. The vessel operators that have invested capital into experimental systems should be commended. Without this kind of proactive pioneering involvement from the shipping industry, truly practical treatment systems can never be created. The evolution of ballast treatment systems will evolve similar to other technologies, such as computers. The more consumers purchase them, the faster they improve, and the fewer invasive species will be introduced into our waters.

- The Region 10 Regional Office of the U.S. Environmental Protection Agency developed an invasive species strategy in January of 2003. The strategy included the establishment of ½ FTE to serve as Invasive Species Coordinator, and the formation of a cross-program invasive species team. Invasive species education and in-house coordination to develop contacts with other agencies and the community are underway. The team is currently working on a grant proposal to determine origin and invasion history of invasive species along the west coast and to establish the degree of connection with those species in San Francisco Bay. The team has developed an in-house grant condition that would have all EPA programs consider how their program impacts, or is impacted by, invasive species. The project is currently working on a proposal to develop a rapid assessment tool that relies on molecular genetic characterizations to identify invasive species in ballast water. This project could have implications for west coast ballast water management, although on September 2, EPA denied the ballast water petition asking them to regulate ballast water under NPDES permits.

The members of the ANS Committee, which are listed on the following pages, created this report. The Committee meets twice yearly and the Executive Committee (Excom) meets monthly. Legislators and legislative staff that sometimes participate in the committee meetings or advise the committee are also listed.

AQUATIC NUISANCE SPECIES
COORDINATING COMMITTEE MEMBERSHIP

Status	Last Name	First Name	Affiliation	email address
Excom	Aitkin	Kevin	U.S. Fish and Wildlife Service	"kevin_aitkin@fws.gov"
Excom	Anderson	Kevin	Puget Sound Action Team	"KAnderson@psat.wa.gov"
Excom	Brown	Wendy	Department of Natural Resources	"wendy.brown@wadnr.gov"
Excom	Cabreza	Joan	Environmental Protection Agency	"cabreza.joan@epa.gov",
Excom	Copping	Andrea	Sea Grant, Washington	"acopping@u.washington.edu"
Excom	Determan	Tim	Department of Health	"tim.determan@doh.wa.gov"
Excom	Devoe	Dan	Washington State Patrol Commercial Vehicle	ddevoe@wsp.wa.gov
Excom	Dickison	Jeff	Squaxin Tribe	"jdickison@squaxin.nsn.us"
Excom	Hamel	Kathy	Department of Ecology, Aquatic Weeds	"kham461@ecy.wa.gov"
Excom	Hewes	Carol	U.S. Army Corps of Engineers	"carol.a.hewes@usace.army.mil",
Excom	McGonigal	Steve	Washington Noxious Weed Control Board	"SMcGonigal@agr.wa.gov"
Excom	Parker	Blain	Columbia River Indian Tribal Fisheries Council	"parb@critfc.org"
Excom	Smith	Scott	Department of Fish and Wildife, Invasive Species Coordinator	smithsss@dfw.wa.gov
Excom	Wessels	Tom	Department of Agriculture	"twessels@agr.wa.gov"
Excom	Wolfe	Dona	State Parks and Recreation Commission	"donaw@parks.wa.gov"
Legislature	Moon	Vic	Washington State Senator	"moon_vi@leg.wa.gov"
Legislature	Buck	Jim	Washington State Representative	"buck_ji@leg.wa.gov"
Legislature	Doumit	Mark	Washington State Senator	"doumit_ma@leg.wa.gov"
Legislature	Jacobsen	Ken	Washington State Senator	"jacobsen_ke@leg.wa.gov"
Legislature	Oke	Bob	Washington State Senator	"oke_bo@leg.wa.gov"

Legislature	Regalla	Debbie	Washington State Senator	"regala_de@leg.wa.gov"
Member	Acheson	Don	Association for the Protection of Hammersley, Eld and Totten Inlets	"windypoint50@hotmail.com"
Member	Antieau	Clay	Washington Department of Transportation -Reed Canary Grass	"antieac@wsdot.wa.gov".
Member	Athearn	Jim	U.S. Army of Corps of Engineers	"jim.b.athearn@usace.army.mil"
Member	Badger	Chris	Port of Vancouver	"chris.badger@portvancouver.com"
Member	Bailey	Gary	Department of Ecology	"gbai461@ecy.wa.gov"
Member	Barson	Len	Nature Conservancy	"lbarson@tnc.org,
Member	Baxter	Rex	U.S. Army Corps of Engineers	"rex.d.baxter@usace.army.mil"
Member	Bohlman	Robert	Marine Exchange	"rbohlman@marineexchangesea.com"
Member	Bowlby	Ed	National Oceanic and Atmospheric Administration	"ed.bowlby@NOAA.gov"
Member	Boyden	Patty	Port of Vancouver	"pboyden@portvanusa.com"
Member	Bradley	Capt. Tom	Port of Vancouver	"captbradley@earthlink.net"
Member	Brancado	Mary Sue	National Oceanic and Atmospheric Administration	"mary.sue.brancato@noaa.gov"
Member	Bright	Kevin	University of Washington	"mtbrett@u.washington.edu"
Member	Brunshill	Roy	King County Noxious Weed Board	206-296-0290
Member	Cain	Lon	Transmarine	"seattle@transmarine.com",
Member	Carelli	Charles	Department of Ecology	"ccar461@ecy.wa.gov"
Member	Cloud	Greg	Department of Ecology	"gclo461@ecy.wa.gov"
Member	Clubb	Bob	Douglas County PUD	"rclubb@dcpud.org"
Member	Connell	Kathleen	Washington Department of Agriculture	"kconnell@agr.wa.gov"
Member	Cooper	Diane	Taylor Shellfish/National Invasive Species Council	"dianec@taylorshellfish.com"
Member	Cooper	Larry	Oregon Department of Fish & Wildlife	"larry.d.cooper@state.or.us"
Member	Cordell	Jeff	University of Washington	"cordell@fish.washington.edu"
Member	Curl	Herbert	Audubon	"strix27@aol.com"

Member	Custer	Cindy	Bonneville Power Administration	"cjcuster@bpa.gov"
Member	Darling	Jim	Port of Bellingham	"jimd@portofbellingham.com"
Member	Degans	Sebastian	Port of Portland	"degens@portptld.com"
Member	Dewey	Bill	Taylor Shellfish	"billd@taylorShellfish.com"
Member	Dionne	Lesley	U.S. Coast Guard	"ldion@pacnorwest.uscg.mil"
Member	Dumbauld	Brett	Department of Fish and Wildlife	"Dumbadrd@dfw.wa.gov"
Member	Elston	Ralph	Pacific Shellfish Institute	"relston@olympus.net"
Member	Emerick	Leslie	Department of Agriculture.	"lemerick@agr.wa.gov"
Member	Emmett	Kathleen	Department of Ecology	"KEMM461@ecy.wa.gov"
Member	Finn	Rick	Port of Portland	"finnr@portptld.com"
Member	Fishel	Jeff	Department of Ecology	"jfis461@ecy.wa.gov"
Member	Fogelsong	Clare	City of Bellingham	"cfogelsong@cob.org"
Member	Gabrielson	John	Environmental Protection Agency	"gabrielson.john@epa.gov"
Member	Gasser	Erv	National Parks Management	"erv_gasser@nps.gov"
Member	Gilmer	Dick	Port of Tacoma	"dickg@portoftacoma.com"
Member	Gorsline	Jerry	Washington Environmental Council	"jerry@wecprotects.org",
Member	Grayson	Guy	Department of Ecology/Spill Program	"GGRA461@ecy.wa.gov",
Member	Hamilton	Jason	USCG	jhamilton@ PACNORWEST.uscg.
Member	Harding	Richelle	D. Rohr & Associates	503-353-6692
Member	Hart	George	U.S. Army Corps of Engineers	"george.a.hart@usace.army.mil",
Member	Hayes	Marc Ph.D.	WDFW/ Habitat Program,Research Scientist	hayesmph@dfw.wa.gov, 360-902-2946,
Member	Heimer	Dave	Department of Fish and Wildlife, Weed Management	425-562-2446, heimedmh@dfw.wa.gov
Member	Herwig	Russell	University of Washington / BW Research	"herwig@u.washington.edu"
Member	Hickey	Barbara	University of Washington/Oceanography	"bhickey@u.washington.edu"
Member	Hickey	Paul	City of Tacoma	"phickey@ci.tacoma.wa.us"

Member	Higgens	Patrick	Canadian Consulate/Natural Resources	"patrick.higgins@dfait-maeci.gc.ca"
Member	Holmes	Frank	Western States Petroleum Association	"fholmes@wspa.org",
Member	Holt	Alan	Nature Conservancy	"aholt@tnc.org"
Member	Hooper	Thom	National Oceanic & Atmospheric Association	"thomas.hooper@NOAA.gov"
Member	Hughes	Leslie	North Pacific Fishing Vessel Owners Association, Vessel Safety Program	"npfvoa@halcyon.com"
Member	Hunter	Rhonda	Department of Ecology	"rhun461@ecy.wa.gov"
Member	Hurley	William	Glosten Associates -Marine Engineering	"wlhurley@glosten.com"
Member	Irish	Ed	Tesoro Petroleum	"airish@tesoropetroleum.com",
Member	Irish	Jim	Bonneville Power	"jtirish@bpa.gov".SMTP,
Member	Jamieson	Glen	Department of Fisheries and Oceans/Canada - Green Crab	"jamiesong@pac.dfo-mpo.gc.ca"
Member	Joerger	Sue	Puget Soundkeeper	"suejorger@pugetsoundkeeper.org"
Member	Johnson	Eric	Washington Ports Association	"ericj@washingtonports.org"
Member	Joubert	Moya	City of Seattle	"moya.joubert@ci.seattle.wa.us"
Member	Kaplan	Brynie	Herrer Environmental Consultants	"bkaplan@herrerainc.com"
Member	Kirby	Grant	Northwest Indian Fisheries Council	"gkirby@nwifc.wa.gov"
Member	Kounts	John	Washington PUD Association	"jkounts@wpuda.org"
Member	Krueger	Katherine	Quileute Indian Tribal Fisheries	"kkrueger@olypen.com"
Member	Kruse	Michelle	Northwest Marine Trade Association	"kruse@nmta.net"
Member	Lantz	Lisa	Botanist/ WA Parks Dept	"lisa.lantz@parks.wa.gov"
Member	Lee	Craig	British Petroleum	"leecw@bp.com"
Member	Li	Kevin	King County	"kevin.li@metrokc.gov"
Member	Lim	Pat	Department of Fisheries and Oceans/Canada - Invasive Species	"limp@pac.dfo-mpo.gc.ca".SMTP,
Member	Litt	Arni	University of Washington	"arni@u.washington.edu"
Member	Lovelin	Bruce	Columbia River Alliance	"cralliance@aol.com"

Member	Mackenzie	Amy	Office of the Attorney General	"amym@atg.wa.gov"
Member	Mahaffy	Mary	U.S. Fish and Wildlife Service	"mary_mahaffy@fws.gov"
Member	Marco	Jerry	Colville Confederated Tribes	"cctfish@mail.wsu.edu"
Member	Mark	Lauren	Washington Sea Grant	"wlmark@u.washington.edu"
Member	Marquardt	Raymond	U.S Shipping	"RMARQUARDT@USSHIPLLC.COM"
Member	Marshall	Randy	Department of Ecology/TMDL/NPDES	"rmar461@ecy.wa.gov"
Member	Martin	Steve	U.S. Army Corp of Engineers	"stephen.g.martin@usace.army.mil"
Member	Meacham	Pamala	Department of Fish and Wildlife - Invasive Species Program	meachpmm@dfw.wa.gov
Member	Meyer	Steve	Department of Fish and Wildlife	meyersrm@dfw.wa.gov
Member	Moore	Mike	Puget Sound Steamship Operators	"Pssoaxd@aol.com"
Member	Mosness	Ann	Institute for Agriculture & Trade Policy	"mosnessiatp@aol.com",
Member	Murphy	Kyle	Department of Agriculture/ Spartina	"KMurphy@agr.wa.gov"
Member	Murray	Bernard	Washington Recreational Boaters Association	"rbawiobg@myhome.net"
Member	Nalen	Charlie	Crowley Petroleum Transport	"charlie.nalen@crowley.com",
Member	Nason	Dick	Chelan County PUD	"dick@chelanpud.org"
Member	Neal	Tonia	Northwest Marine Trade Association	tonia@nmta.net
Member	Nelson	Gary	Port of Grays Harbor	"gnelson@portgrays.org"
Member	Ness	Nancy	Grays Harbor Noxious Weed	"nessn@ccoopext.cahe.wsu.edu"
Member	O'Brien	Chris	Alaska Tankers	"chris.obrien@aktanker.com"
Member	Olson	Jean	Nahkeeta NW	"nnw2@fidalgo.net"
Member	Olson	Steve	Association for the Protection of Hammersley, Eld & Totten Inlets	"ssolson@thurston.com"
Member	Owens	Ed	Coalition of Coastal Fishermen	"EDOWENS@ATTBI.com"
Member	Owings	Tammy	Interagency Committee for Outdoor Recreation	TammyO@iac.wa.gov
Member	Parsons	Jennifer	Department of Ecology, Aquatic Plants	"jenp461@ecy.wa.gov"
Member	Paskovis	Ed	Port of Everett	"edp@portofeverett.com"

Member	Peabody	Betsy	Puget Sound Restoration	"bpeabody@connectexpress.com",
Member	Phelps	Kris	Nisqually Tribe	"kphelps@nwifc.wa.gov"
Member	Phillips	Stephen	Pacific States Marine Fisheries Council	"stephen_phillips@psmfc.org"
Member	Rawson	Bob	U.S. Army Corps of Engineers	"robert.m.rawson@usace.army.mil"
Member	Redman	Scott	Puget Sound Action Team	"sredman@psat.wa.gov"
Member	Reece	Karla	National Oceanic and Atmospheric Administration	"karla.reece@noaa.gov"
Member	Reeves	Blaine	Department of Natural Resources /Nearshore Habitat	"blain.reeves@wadnr.gov",
Member	Reichard	Sarah	University of Washington	"reichard@u.Washington.edu"
Member	Ressler	Peter	Port of Seattle	"ressler.p@portseattle.org"
Member	Reynolds	Kevin	Glosten Associates -Marine Engineering	"kjreynolds@glosten.com",
Member	Riggs	Sharon	Padilla Bay National Estuary/Natural Resources Coordinator	"sriggs@padillabay.gov"
Member	Robertson	Bill	Seattle Aquarium	"billr@kendaco.telebyte.net"
Member	Rogers	Russell	Department of Fish and Wildlife/ Shellfish	360-586-1498, ROGERRER@dfw.wa.gov
Member	Rohr	Denny	Mid-Columbia PUD's	"drohr5@aol.com"
Member	Rotter	Dan	Cypress Island, Inc.	360-273-8002
Member	Ruesink	Jennifer	University of Washington	"ruesink@u.washington.edu"
Member	Rumball-Petre	Rose	National Parks Service	"rose_rumball-petre@nps.gov".SMTP
Member	Rupp	John	Tacoma Zoo/Aquarium	"jrupp@pdza.org"
Member	Rust	Mike	National Oceanic and Atmospheric Administration	"Mike.Rust@NOAA.gov"
Member	Rylko	Michael	Environmental Protection Agency	"rylko.michael@epamail.epa.gov"
Member	Schow	Raymond	Washington Recreation Boaters Association	PO Box 3948 Federal Way 98063
Member	Secord	Dave	University of Washington/Tacoma	"dave@u.washington.edu"

Member	Sele	Brad	Department of Fish and Wildlife	360-586-1498	"selebbs@ dfw.wa.gov"
Member	Shaughnessy	Dean	Port of Everett	360-586-1499	"DeanS@portofeverett.com"
Member	Shultz	Ron	Governor's Office / Policy Advisor	"ron.shultz@ofm.wa.gov"	
Member	Stahl	Dan	Port of Anacortes	"dstahl@portofanacortes.com".	
Member	Stenvall	Charlie	U.S. Fish and Wildlife Service/ Willapa Bay Nat'll Wildlife Refuge	"charlie_stenvall@fws.gov"	
Member	Strathman	Richard	University of Washington/ Friday Harbor labs	"strath@fhl.washington.edu"	
Member	Sytsma	Mark	Portland State University	"sytsmam@pdx.edu"	
Member	Thomson	Andrew	Department of Fisheries and Oceans, Canada / Atlantic Salmon Management	"ThompsonAn@pac.dfo-mpo.gc.ca",	
Member	Thorsteinson	Lyman	US Geological Service, Western Fisheries Research Center	"lyman_thorsteinson@usgs.gov",	
Member	Toohey	Mary	Department of Agriculture	"mtoohey@agr.wa.gov"	
Member	Wainwright	Liz	Merchants Exchange, Portland	"wainwright@pdxmex.com"	
Member	Walker	Julia	Association for the Protection of Hammersley, Eld & Totten Inlets	"juliacwalker@uswest.net",	
Member	Wamsley	Bill	Lewis County, Noxious Weed Control Board	"wamsleyb@wsu.edu"	
Member	Wecker	Miranda	Spartina/Willapa Bay	"mwecker@willapabay.org"	
Member	Wenger	Barry	Department of Ecology	"bwen461@ecy.wa.gov",	
Member	Wickman	Rick	Columbia River Steamship Operators Lobbyist	"r.wickman@attbi.com",	
Member	Wishart	Bruce	People for Puget Sound	"bwishart@pugetsound.org"	
Member	Wylie	Jack	Oregon Department of Fish & Wildlife (Ballast Water)	"wylie.jack@DEQ.STATE.OR.US"	
Member	Zimmerman	Jim	Washington Fish Growers Association	"njzim@nwi.net"	