

# SOLID WASTE (TRASH & MARINE DEBRIS)

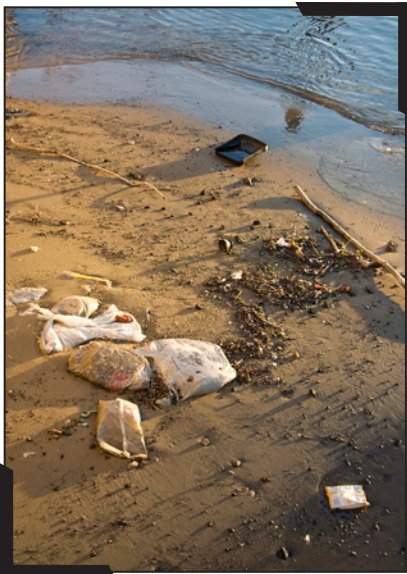
## Applicability

*This section applies to all marinas.*

## Background

The day-to-day activities of marina patrons and the marina itself can generate substantial amounts of solid waste. A few examples include bottles, cans, plastic bags, paper bags, food containers, cigarette filters, fishing line and polystyrene bait containers. Items such as discarded fishing line or plastic rings used to hold soda cans or bottles together can injure wildlife living

within or near the marina through entanglement or ingestion. Ghost fishing, the entanglement of fish and wildlife, is a serious threat. Some of today's advanced fishing lines take a long time to break down in the environment. Waterfowl may become tangled in discarded line, often resulting in injury or death. Plastic bags and fishing line can be costly to boaters. These plastics can snare propellers and clog engine intake systems. Not only can marine debris be an eyesore, it can also harm patrons. Broken glass or fishing lures can cut or puncture the feet of swimmers. By providing sufficient waste receptacles, much of this litter can be kept out of the marina's basin or adjacent waterways.



Trash in the marina environment is unsightly and can injure wildlife.



## Existing Federal and State Laws

The Indiana Department of Natural Resources regulates the disposal of waste near a lake and prohibits the disposal of contaminants or waste within 15 feet of a lake or in a floodway. It is illegal to discharge waste, oil, trash or other toxic substances into Indiana state waters under IC 14-15-2-8 during the operation or use of watercraft.

# SOLID WASTE (TRASH & MARINE DEBRIS)

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The MARPOL (Marine Pollution) treaty is an international law that has been adopted by the United States. Annex V of the treaty is aimed toward protecting navigable waters from trash. The treaty makes it illegal to discharge any garbage, including plastic, paper, rags, glass, food, crockery, metal or dunnage (lining and packing materials that float) in the navigable waters of the United States and in all waters, within three nautical miles of the nearest land. The discharge of garbage is prohibited in the Great Lakes and their connecting or tributary waters.

The MARPOL treaty also requires any boat over 26 feet to display a placard at least 4 inches by 9 inches notifying passengers and crew about garbage restrictions.

Most every patron recycles in their daily lives, be it at home or at work. Recycling is also important at marinas. Much of the garbage produced at marinas is the same as household trash, including glass, plastic, paper and metal. Over the past 15 years, the use of marina shrink wrap to

cover boats during the winter seasons has increased dramatically. Marina shrink wrap presents a disposal concern and a recycling opportunity. Shrink wrap is not biodegradable, and it can become a disposal problem at landfills. In the landfill, it consumes capacity and is wasteful because it is only used once. There is an opportunity to recycle shrink wrap because it is a high quality plastic for which markets are readily available.



Shrink wrap used for winter storage can be recycled.

# SOLID WASTE (TRASH & MARINE DEBRIS)

## Best Management Practices

Marinas can implement these best management practices to control solid waste.

- Place trash receptacles in convenient locations around the marina for patrons to use, such as on each gangway. Select high-traffic areas near boat launches and bathrooms, by vending machines, near the dog walk area, and along the path to the parking lot. Make sure the receptacles are secured wherever there is a possibility they may be inadvertently tossed or blown into the water. Provide lighting in these areas.
- If possible, utilize covered receptacles to reduce pest issues. Make sure to empty the containers frequently. Inspect the areas daily to make sure the containers are not full or that garbage was not placed next to it.
- Instruct patrons on proper garbage protocol. Have them practice trash in, trash out. Remind them that plastic bags blow and that they should use recyclable containers and reusable bags. Ask them to cut the rings of six pack holders prior to disposal. Post signs to educate boaters on the location and use of the containers.
- Place recycling bins for glass, plastic and metal cans next to each garbage can. Contact your trash hauler or local solid waste management district about setting up a recycling program. Have the recycling bins be of a different color or shape than the garbage cans to better identify them.
- Recycle winter storage shrink wrap.
- Promote used fishing line collection for recycling or proper disposal.



Trash and recycling bins are placed adjacent to each other for convenience.



A recycling hauler collects shrink wrap from Trail Creek Marina in Michigan City.



# SOLID WASTE (TRASH & MARINE DEBRIS)

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- Use a pool skimmer or fish landing net to pick up floating debris that collects within the basin.



A fisherman recycles fishing line to prevent entanglement of fish and wildlife. The homemade recycling bin was installed near the docks.



An employee of Washington Park Marina in Michigan City skims the basin to collect floating debris.

# FISH WASTE

## Applicability

*This section applies to all marinas.*

## Background

Fish waste can lead to water quality problems if not properly disposed of within a marina due to its sheltered environment. As part of the decomposition process, bacteria consume oxygen dissolved in the water column, leading to foul odors and, in severe cases, fish kills. It is also unattractive. Who wants to see floating fish parts or smell decaying fish as they lounge on their boat? Although the death and decomposition of fish is a natural process in our waterways, the potential volume of fish waste generated during the heavy boating seasons and fishing tournaments can quickly overwhelm the natural environment if the waste is simply tossed overboard.

Fish cleaning stations offer patrons an alternative to tossing fish waste overboard, leading to a cleaner, more attractive marina. Many patrons appreciate fish cleaning stations as it provides an alternative location to their boat for the messy job of cleaning a fish.



Bluegills (Photo by John Maxwell, IDNR)



This fish cleaning station is at Trail Creek Marina in Michigan City.

## Existing Federal and State Laws

The disposal of fish waste is regulated under IC 14-22-9-6, which states all offal or filth of any kind accruing from the catching, curing, cleaning, or shipping of fish in or near the water of Lake Michigan shall be burned, buried, or otherwise disposed of in a sanitary manner that does not pollute the water. It also states the waste should not become detrimental to public health or comfort.

# FISH WASTE

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## Best Management Practices

Below are some best management practices that can be implemented to control fish waste within a marina.

- Install fish cleaning stations. The fish cleaning stations should be in a convenient location that is sheltered from wind and rain. The station should be designed to grind the fish waste. Running water should be supplied. Ask your local sanitary district if the station can be plumbed to the sanitary sewer. Keep the cleaning station sanitary and clean to attract patrons.



Encourage boaters to use fish cleaning stations, such as this one at Washington Park Marina in Michigan City.

- Educate patrons on fish waste protocol. Explain that disposing of fish waste in the marina basin is prohibited. Inform them on the locations and hours of fish cleaning stations.
- Prohibit cleaning of fish at docks. This will keep your marina cleaner, keep odors down and reduce nuisance birds and pests.
- Utilize alternative disposal options for fish waste. Consider composting fish waste and using it as a natural fertilizer. The University of Wisconsin Sea Grant Institute has published “The Compost Solution to Dockside Fish Wastes,” a report describing how to compost fish waste and transform it into a useful, potentially marketable product. The report can be downloaded from the Web at <http://aqua.wisc.edu/publications/> (click on “Fisheries Research”) or ordered from the University of Wisconsin Aquatic Sciences Center at (608) 263-3259.
- Help prevent the spread of viral hemorrhagic septicemia (see page 75) and other fish diseases by encouraging boaters not to use fish parts as bait or chum.
- If there are no disposal options, have the boaters double bag the fish waste and dispose of it with the regular trash.



# LIQUID MATERIALS

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## Applicability

*This section applies to all marinas.*

## Background

Marina operations and day-to-day boat maintenance require the use and storage of a variety of liquid materials. Engine lubrication, bilge pump repair and cleaning, boat hull maintenance and deck washing can contain corrosive or toxic chemicals such as antifreeze, oils, fuels, solvents, paints, and assorted corrosive cleaners. Adequate storage, handling, recycling, or disposal of these hazardous materials is very important to keep these materials out of the marina basin and adjacent waterways and to prevent pollution.



Oil recycling is a best management practice marinas can implement.

## Existing Federal and State Laws

The Indiana Department of Natural Resources regulates the disposal of waste near lakes and prohibits the disposing of contaminants or waste within 15 feet of a lake or in a floodway. It is illegal to discharge waste, oil, trash or other toxic substances into Indiana state waters under IC 14-15-2-8. Several other agencies regulate hazardous wastes and materials. They include the Indiana Department of Environmental Management, the Indiana Department of Labor (administering the Occupational Safety and Health Administration regulations), the Indiana Department of Homeland Security's Division of Fire and Building Safety, and the U.S. Department of Transportation.

## Best Management Practices

Listed below are several best management practices that marinas can implement to prevent harmful liquid materials from entering the marina basin or nearby waterways.

- Have a spill response plan. Have spill containment/cleanup supplies readily accessible. Have semiannual spill response drills. Have a list of response equipment and locations. Inspect spill supplies weekly and replace items as necessary.

# LIQUID MATERIALS

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- Train employees in oil spill response. Have every staff member aware of what their responsibility is. Post emergency numbers at fueling stations and around the liquid storage area.
- Build curbs, berms, or other barriers that can contain a spill, should one occur in areas used for storage. The containment area should be able to hold 10 percent of the total volume of liquid materials stored or 110 percent of the volume of the largest container in storage. Protect or close any floor drains in the area, including storm drains.



Used oil, antifreeze and other liquid collection containers should have secondary containment to catch spills and prevent releases to the environment (Photo by Cathy Csatari, IDEM).

- Store liquid materials on a surface that is impervious and allows ease of cleanup. Keep the containers protected from rain, snow and excessive heat.
- Store minimal quantities of hazardous materials if possible. Use “just in time” inventory control and rotate stock.
- Have clearly labeled, chemically compatible, U.S. Department of Transportation-approved containers for all waste storage. Plainly mark each container, identifying the type of waste material to be placed in it. Separate containers should be used for different activities, if possible. Keep the containers closed when not in use.
- Recycle liquid materials when possible. Have different containers labeled for used oil and antifreeze.
- If your marina is accepting used oil, you should accept oil filters at the same location. Drain the oil from the filter into the used oil drum. Place the used filter into a separate drum for recycling.
- Use and promote environmentally-friendly products such as antifreeze formulated with less toxic propylene glycol instead of highly toxic ethylene glycol, water-based paints and low volatile organic compound coatings as long-lasting and nontoxic antifouling paint when possible.



# LIQUID MATERIALS

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- Encourage boaters to utilize household hazardous waste collection programs in their community for disposal of unwanted chemicals.
- Educate patrons on the proper disposal of unwanted waste chemicals. Post signs near dumpsters.



Encourage boaters to use nontoxic antifreeze and stock it in your marina store if you have one.

## For More Information

**Appendix D** – (pages 105-110)  
Complying With the  
Hazardous Waste Rules

**Appendix G** – (pages 125-158)  
Hazardous Waste Streams

**Appendix H** – (pages 159-162)  
Hazardous Waste Generator  
Status and How the Rules  
Apply to You

**Appendix I** – (pages 163-169)  
Selecting a Waste Transporter  
& Recycling/Waste  
Management Company

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# PETROLEUM CONTROL

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## Applicability

*This section applies to marina operators and individual boat owners.*

## Background

Recreational boating fuel and oil spills are often the result of careless fueling practices or from fuel and oil discharged from bilges. It is not uncommon to see a small fuel sheen on the water surface near docked boats. Not only are these fuel spills unsightly and unpleasant smelling, they can pose serious harm to the aquatic environment.



Marina operators and boaters can prevent damage to the aquatic environment by using pollution prevention best management practices that prevent fuel and oil spills.

As the petroleum sheen spreads across the surface of the water, it creates a barrier to oxygen movement across the water and to surface dwelling animals. As it slowly sinks to the bottom, it clogs plant pores and decreases their ability to uptake oxygen. As the oil settles to the floor, bottom feeders ingest the oil, disrupting their reproduction and growth.

## Existing Federal and State Laws

The Indiana Department of Natural Resources regulates the disposal of waste near lakes and prohibits the disposing of contaminants or waste within 15 feet of a lake or in a floodway. It is illegal to discharge waste, oil, trash or other toxic substances into Indiana state waters under IC 14-15-2-8.

The Indiana Department of Homeland Security's Division of Fire and Building Safety regulates marine fueling facilities under Chapter 22 of the 2008 Indiana Fire Code and more specifically, Section 2210 (675 IAC 22-2.4). They address construction of facilities, storage and handling of associated liquids, dispensing of fuels, fire prevention and protection methods, and venting of tanks.

## Best Management Practices

Marinas and recreational boaters can implement the best management practices on page 60 to prevent or reduce the amount of petroleum products entering the aquatic environment.



# PETROLEUM CONTROL

- Promote the installation of fuel/air separators on inboard fuel tank air vents. This will help reduce the amount of fuel spilled into surface waters while fueling. These separators are available commercially and are typically easy to install.
- Avoid overfilling fuel tanks. Remember fuel expands in warm weather. Encourage boaters to fuel up prior to going out. If they must refuel upon their return, suggest that they only fill the tank 90 percent to allow for vapor expansion. Never leave the boat unattended while fueling and listen for a sound change as the tank gets close to full.
- Provide fuel absorbing pads or rings at the fuel dock. Have precut pads or doughnuts that fit the nozzle and encourage boaters to use them. Their use will reduce splashback and drips from entering the water.



Use absorbent bilge pads to soak up oil and fuel and properly recycle or dispose of them.



The use of a bilge sock would help prevent oil collected in the bottom of this bilge from being discharged to the lake (Photo by Joe Exl, IDNR).

- Encourage boaters to routinely check for engine fuel leaks. Teach them how to check fuel lines for signs of wear. Promote the use of drip pans under engines.
- Prohibit the use of detergents on fuel docks to dissipate fuel spills.
- Keep engines properly maintained.
- Prohibit the filling of portable containers on the fuel dock as well as the fueling of boats in the water using portable containers.
- Immediately report oil and fuel spills to the marina office and the U.S. Coast Guard National Response Center at (800) 424-8802.
- Request that boaters avoid pumping bilge water that has an oily sheen. Use bilge socks to collect floating oil and fuel in the bilge. Offer recycling/disposal options for the used absorbents.

# BOAT CLEANING

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## Applicability

*This section applies to marina operators and individual boat owners.*

## Background

As noted in the Liquid Materials section on pages 55-57, some of the common products used by boat owners and marina operators to clean boats can cause harm to the aquatic environment if care is not taken during their use. Special care and consideration should be taken when cleaning boats in the water. Some cleaning products contain harsh chemicals such as chlorine, ammonia, and phosphates that can harm fish and wildlife. If the product is labeled as being harmful to the user (“toxic” or “may cause burns”) it is most likely harmful to aquatic life. While the potential of harm in cleaning a single boat is quite low, it must be multiplied by the number of people cleaning their boats. Many products on the market promise a sparkling shine and ensure that they will get the surface clean with minimal effort by the user. However, there are old-fashioned, environmentally-sound methods of boat cleaning. The old adage “use a little elbow grease” is a good mantra to follow.



A man pressure washes a boat hull in a designated area equipped to reduce the impact of wastewater (Source: U.S. EPA Clean Marinas/Clear Value).

An additional concern regarding boat cleaning involves the antifouling paints that are used on boat hulls to prevent the boats from getting covered in algae or slime or encrusted with zebra mussels. Aggressive cleaning such as mechanical scrubbing below the waterline can displace this paint, allowing it to settle to the bottom.

Some of the chemicals contained in cleaners or antifouling paints can bioaccumulate in aquatic organisms. They become more concentrated as they are ingested successively by animals higher up on the food chain. Ultimately, these contaminants could wind up in the fish that are eaten by people. If boat cleaning is done in an environmentally-sensitive manner the introduction of these chemicals can be reduced.

# BOAT CLEANING

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## Existing Federal and State Laws

Marina operators should note that under the Clean Water Act, the National Pollutant Discharge Elimination System Permitting Program defines boat wash water as “process water” (U.S. EPA, 2001). Discharge of any process water is illegal without a permit from IDEM under this program. Any questions involving this program should be directed towards IDEM’s Office of Water Quality, Permit Branch at (800) 451-6027.

The Indiana Department of Natural Resources regulates the disposal of wastes near lakes and prohibits the disposal of contaminants or wastes within 15 feet of a lake or in a floodway. It is illegal to discharge waste, oil, trash or other toxic substances into Indiana state waters under IC 14-15-2-8.

## Best Management Practices

Recreational boaters and marina operators can implement these best management practices while cleaning boats.

- Whenever possible, wash the boat on land in a contained area where the wash water can be collected and treated.
- Wash boat hulls above the waterline by hand using a soft sponge and frequently enough so that the need to use cleaners will be reduced.
- Avoid using caustic cleaners such as bleach, ammonia or lye. Do not use petroleum-based cleaning products.
- If possible, use cleaning products that are environmentally friendly (e.g., non-toxic or phosphate-free). Always follow the instructions on the label and test the product in an inconspicuous area. Use the products sparingly and only when “elbow grease” is not working. Beware of biodegradable cleaners that may still be toxic. Some homemade non-toxic cleaning alternatives are listed on page 64.
- Use long-lasting or low-toxicity antifouling paints. Use silicone or hard-surfaced nonablative copper metal-based paints.



This professional boat cleaning service uses “elbow grease” and environmentally-friendly cleaning products.



# BOAT CLEANING

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- Take precautions to prevent the spread of aquatic invasive species when transferring boats from one water body to another by using hot water and allowing the boat to thoroughly dry for a minimum of five days. Boaters in the Great Lakes can take additional precautions to help prevent the spread of viral hemorrhagic septicemia (VHS) by disinfecting their boat and gear with a dilute bleach solution. Disinfection with bleach should occur away from lakes and rivers because it is toxic to aquatic life. Please refer to pages 71-77 for more information on nuisance and aquatic invasive species.



These boat cleaning professionals wash boats on land.

- Keep your boat waxed. A good coat of wax will prevent surface dirt from becoming ingrained in the hull and makes your boat easier to clean later.
- Minimize the impacts of wastewater from pressure washing. This can be done by using settling traps where the wash water is allowed to sit long enough for the large particles to settle to the bottom before discharging the water, by using a filtration unit that screens out particles, and chemical or biological treatment of the collected water. Treatment can remove oil, grease, metals and other contaminants. Effluent from pressure washing usually will require a storm water discharge permit.

## Tip

If collecting and treating wastewater is not feasible, wash boats on a permeable surface such as gravel or on a lawn as far away from the waterway or storm drain as possible. This will allow the wastewater to infiltrate into the ground. Make sure, however, that there is no drinking water well nearby. Place filter fabric over the permeable surface to collect solids. Dispose of solids in an appropriate manner.

# BOAT CLEANING

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## Non-Toxic Cleaning Alternatives

- **All Purpose Cleaner**

Straight vinegar, vinegar and salt, or a paste of baking soda and water are all effective grease cutters.

- **Aluminum Cleaner**

After removing as much substance as possible, fill a pan with one quart of water and two tablespoons cream of tartar. Bring to a boil and simmer for ten minutes. Rinse well.

- **Window/Glass Cleaner**

Fill a spray bottle with equal amounts of vinegar and water. Apply with a soft cloth and dry with a squeegee or newspaper.

- **Furniture Polish**

Use olive oil on all wood surfaces. Apply with a soft cloth, rub in, let stand for several hours, and then polish with a soft, dry cloth to remove any residue.

- **Tile Cleaner**

Sprinkle baking soda on a sponge or green scouring pad. Add vinegar to remove rings or soap scum.

- **Decorative Metal Cleaner**

(for brass, copper or pewter)

Combine 1/2 cup of salt with 1/2 cup white vinegar. Add enough flour to make a paste. Apply and let sit 15 minutes to one hour. Rinse thoroughly to prevent corrosion. Salt and vinegar should not be used on metals that have a lacquer coating.

- **Copper Cleaner**

Make a paste of lemon juice, salt and flour.

- **Fiberglass Stain Remover**

Use a paste of baking soda.

- **Mildew Remover**

Combine lemon juice and salt or white vinegar and salt to make a paste.



Environmentally-friendly cleaning products have less of an impact on the environment than toxic or phosphate-containing products.

### For More Information

See **Appendix L** for information on household hazardous waste collection (pages 194-195) and local solid waste management districts (pages 195-196).

# PUBLIC EDUCATION

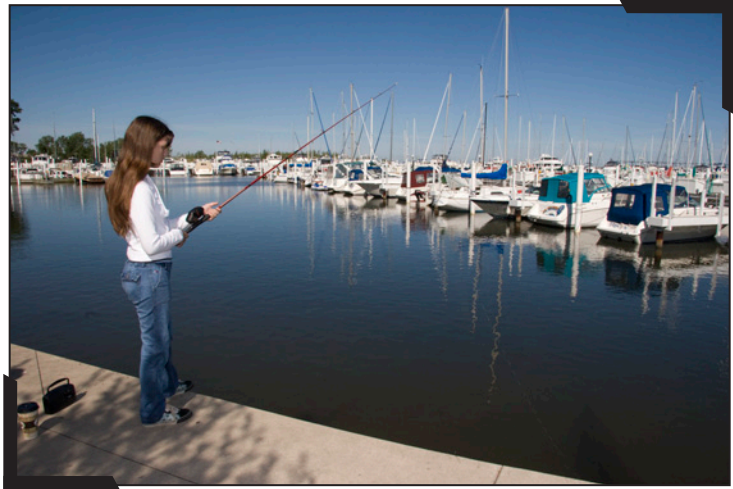
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## Applicability

*This section applies to all marinas and any agency or group involved in boater education.*

## Background

Public education is one of the most effective and efficient ways to reduce nonpoint source pollution in marinas. Recreational boaters who understand how their daily activities can impact water quality are often happy to do their part to protect the resource. There are numerous sources of public education programs and materials that are available for marinas and boaters to utilize. Examples include the Indiana Department of



Natural Resources' boaters' education program, which features a free, online boat safety course, and this guidebook! Additionally, marinas may want to check if the town or city in which they are located is designated as a municipal separate storm sewer system community. If so, there may be information from the community's municipal separate storm sewer system coordinator that can be used.

## Best Management Practices

Listed below are just a few of the many best management practices that are available for public outreach and education as well as marina staff.

- Use signs to inform boaters of appropriate clean boating practices. Post signs at the marina office, docks and near waste disposal receptacles. Have best management practice signage and spill control measures posted at pumpout and fueling stations. Make sure the signs are easy to read by using large print and eye-catching designs.
- Utilize bulletins to post environmental messages. Post the bulletins in areas frequented by boaters such as the marina store and restrooms.

### Boater Education

Information about IDNR's boaters' education program can be obtained by contacting the Law Enforcement Division at (317) 232-4010, your local law enforcement district office, or visit the website at [www.IN.gov/dnr/lawenfor/2755.htm](http://www.IN.gov/dnr/lawenfor/2755.htm).



# PUBLIC EDUCATION

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- Promote recycling. Offer recycling and post signs directing boaters to recycling locations.
- Distribute pamphlets, newsletters, and inserts with bill mailings that promote appropriate clean boating practices. Include maps that show the pumpout, dump, fish cleaning and fueling stations as well as locations for environmental services, including locations to obtain spill cleanup kits and recycle batteries, oil, plastic, metal, and glass.
- Educate and train marina staff to be environmentally conscious as they perform their duties and to be role models for marina patrons.
- Insert language into marina contracts that promotes and ensures that tenants will comply with the marina's best management practices. Make sure that they are aware of any restrictions on boat cleaning, repair and maintenance.
- Have a best management practice agreement for outside contractors to sign as a precondition to performing any work inside the marina.
- Mark storm drains with phrases such as "Dump No Waste—Drains to Lake Michigan" or use similar wording tailored to the name of your lake or reservoir.
- Hand out the clean boater tip sheets that accompany this guidebook (see Appendix K on page 175).



The Hammond Marina in Hammond offers battery recycling in its public laundry room.

# PUBLIC EDUCATION

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This storm drain is marked with fish symbols and text that indicates, "Dump No Waste! Drains to Waterways."



A sign posted at the launch ramp provides boaters with tips on how to prevent the spread of exotic invasive species.

# PUBLIC EDUCATION

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Signage for dog owners encourages proper waste handling.



Free educational signage is available at [www.boatus.com/foundation/cleanwater/drops/marinas/Educational.asp](http://www.boatus.com/foundation/cleanwater/drops/marinas/Educational.asp).

## For More Information

**Appendix J** – (pages 171-174)  
Sample Contract Language  
(for tenants and outside  
contractors)

**Appendix K** – (page 175)  
Clean Boater Tip Sheets

# BOAT OPERATION

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## Applicability

*This section applies to all marinas.*

## Background

Boat traffic and operation can have a significant impact on shallow water habitats. Boat wakes can have an erosive effect on shorelines and uproot submergent and emergent plants. This leads to reduced habitat for fish and wildlife and increases suspended sediment loads. Suspended sediment reduces the amount of sunlight penetrating the water column, shading out submerged plants that are important to fish for habitat and oxygen production. As the suspended sediments settle, they can smother fish nests and habitat. Excessive suspended sediments also give water an unpleasant brown coloration.



## Existing Federal and State Laws

Motorboats are restricted to idle speed within 200 feet of the shoreline of Lake Michigan and any other lake (IC 14-15-3-17). Within this near-shore zone, the only legal operations for motorboats are for trolling or to leave or enter a dock, pier, or wharf. Informational buoys are often placed to assist the boater in identifying the 200-foot near-shore zone, but the existence of these buoys is not required to establish the offense. Where these informational buoys exist, they are white and marked with an orange rectangle and black lettering.



## Best Management Practices

Listed below are a few boat operation best management practices that marinas can implement to help protect shallow water habitats in their marinas.

- Restrict boater traffic in shallow water areas.
- Establish no wake zones to reduce turbidity, shoreline erosion, and damage to the marina. Establishing a



# BOAT OPERATION

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no-wake zone or a zone where boats are prohibited can be lawfully accomplished by the U.S. Coast Guard or the Natural Resources Commission but not by a private citizen. At the state level, a rule adoption would be required. A citizen could petition the NRC to establish a special boating zone. When such a petition is received, the Indiana Department of Natural Resources would form a committee to review the petition and make recommendations to the IDNR director and the NRC.

- Discourage power loading of boats at launch ramps as much as possible.



No wake zones can be established to protect shallow water habitat and help prevent shoreline erosion.

# EXOTIC & NUISANCE AQUATIC SPECIES

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## Applicability

*This section applies to all marinas, especially those that offer launch ramps.*

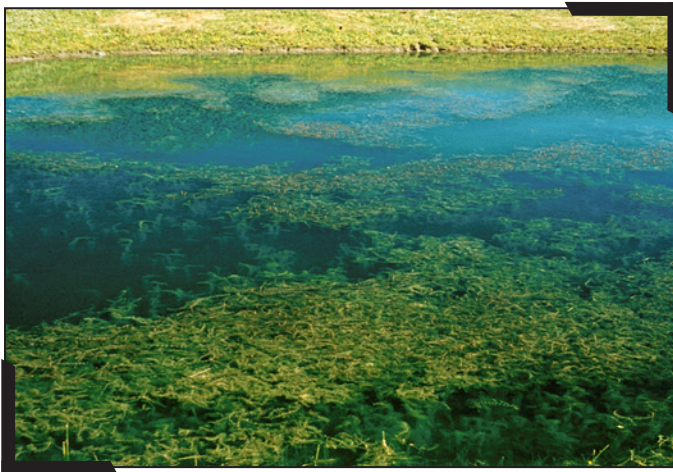
## Background

The waters of the Midwest are under attack by aquatic invasive species. These aquatic invaders are also called “exotic” or “nonindigenous” because they are not native to our waters. Many came from Europe and Asia in the ballast waters of ships and are spreading at alarming rates. In several cases they are having significant impacts on our native species and habitats.

Some of these species are spreading as “hitchhikers” on boats and other recreational equipment. Whenever boaters move from one body of water to another without cleaning their equipment, harmful organisms may remain attached and be carried to the next waterway inadvertently spreading the invader.



Eurasian Watermilfoil (Source: Alison Fox, University of Florida, [www.Bugwood.org](http://www.Bugwood.org))



Eurasian Watermilfoil (Source: Robert L. Johnson, Cornell University, [www.Bugwood.org](http://www.Bugwood.org))

## Aquatic Hitchhikers

- **Eurasian Watermilfoil**

This aquatic plant can form dense mats that crowd out native vegetation and impede recreational activities. It has whorls of feather-like leaves consisting of 12 to 21 pairs of leaflets. This plant often is spread on boat motors and trailers.

# EXOTIC & NUISANCE AQUATIC SPECIES

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- **Zebra Mussel**

This fingernail-sized mussel filters high amounts of microorganisms (plankton) from the water column leaving less food available for native organisms such as larval fish. They can be transferred as microscopic larvae in standing water, or as juveniles and adults on boat hulls or aquatic plants.



Zebra Mussels (Source: Michigan Sea Grant)



Round Goby (Source: Michigan Sea Grant)

- **Round Goby**

This bottom-dwelling fish was first introduced in the 1990s via ballast water of ships from Eurasia. In several areas of the Great Lakes, it has pushed out native fishes becoming the numerically dominant fish. Round gobies can be spread when adults are used as bait, and when eggs are transported on boat hulls. The goby can be easily identified by the fused fin on its belly.



Round Goby in a Gloved Hand (Source: Michigan Sea Grant)



# EXOTIC & NUISANCE AQUATIC SPECIES

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- **Spiny Waterflea**

This large (0.25 inch long) planktonic animal competes with native *Daphnia* and may alter plankton communities. Both adults and eggs can be spread in standing water.



Spiny Waterflea with egg sac (Source: J. Lindgren, Minnesota DNR)



Two bighead carp demonstrating a size comparison (Source: David Riecks, University of Illinois at Urbana-Champaign, Illinois-Indiana Sea Grant College Program)

- **Bighead Carp**

This fish is invading the Mississippi River and its tributaries, where it competes for food directly with native mussels and fishes. It can be spread when anglers use juvenile bighead carp as bait. (Juvenile bighead carp closely resembles shad.) It can be identified by its large size, low eye, and partial keel on its belly.

- **Silver Carp**

This fish is invading the Mississippi River and its tributaries, where it competes for food directly with native mussels and fishes. Silver carp jump out of the water when disturbed, posing a hazard to boaters. It can be identified by its large size, low eye, fully keeled belly and jumping ability.



Silver carp (Source: David Riecks, University of Illinois at Urbana-Champaign, Illinois-Indiana Sea Grant College Program)



# EXOTIC & NUISANCE AQUATIC SPECIES

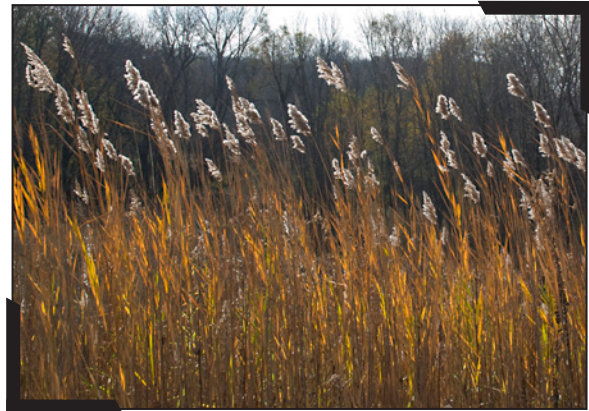
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Silver carp at a location in Missouri (Source: University of Missouri Extension)

- **Phragmites**

Also known as common reed, phragmites can form dense impenetrable fence-like masses along lake and wetland edges. It tends to outcompete and eliminate other native wetland plant species and provides poor habitat for waterfowl and other native birds.



Phragmites



Purple loosestrife (Source: IDNR)

- **Purple Loosestrife**

This perennial wetland plant can grow in dense stands that choke out native vegetation and reduce food and shelter for wildlife. It spreads primarily as seeds and is common along roadside ditches.

# EXOTIC & NUISANCE AQUATIC SPECIES

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Gizzard Shad with lesions caused by viral hemorrhagic septicemia (Photo by Dr. Mohamed Faisal, Michigan State University)

- **Viral Hemorrhagic Septicemia (VHS)**

VHS is a viral fish disease responsible for large scale mortalities of various fish species within the Great Lakes. It continues to spread throughout the Great Lakes Basin.



Gizzard Shad with lesions caused by VHS (Photo by Dr. Mohamed Faisal, Michigan State University)

## Existing Federal and State Laws

The Indiana Department of Natural Resources has statutory responsibility for regulating the importation of fish (IC 14-22-25-2), possession of live exotic nuisance species of fish (312 IAC 9-6-7), and fish stocking (312 IAC 9-10-8). Listed fish are illegal to import, possess, or release into public waters without a permit. In addition, if a banned species is caught it is illegal to release the fish alive. A permit is required before beginning aquaculture activities (IC 14-22-27). Pests or pathogens that are considered harmful can be restricted or eliminated (IC 14-24-2-5) and can include arthropods, mollusks, or exotic weeds (IC 14-8-2-203). Additionally, a person may not take mussels or mussel shells from waters of the state without possessing a license (IC 14-22-17).



Zebra Mussel (Source: Michigan Sea Grant)

## Best Management Practices for Boaters

These and other invasive species can be accidentally spread by boaters who travel from infested to uninfested waters. Some species can be picked up on boating equipment including boats, trailers, motors, tackle, downriggers, anchors, axles, rollers, and centerboards. Others can be carried in water of livewells, bait buckets, motors, bilges and transom wells. Even a small piece of Eurasian water-

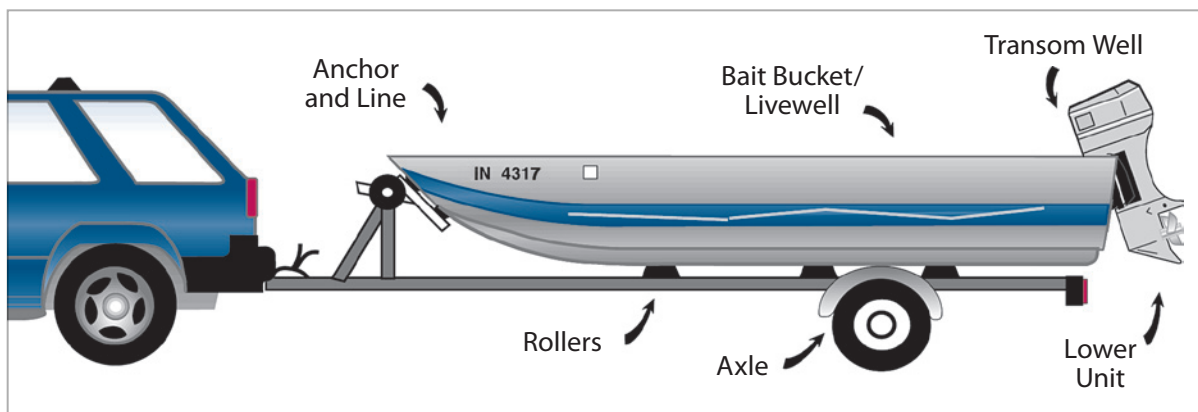
milfoil attached to an anchor or a handful of zebra mussels in a bait bucket can lead to an invasion if introduced into an uninfested waterway. Boaters can help prevent this from happening. To avoid spreading invasive species, follow the steps on page 76 before transporting marine craft to another waterway.

# EXOTIC & NUISANCE AQUATIC SPECIES

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## ■ Before Leaving the Boat Launch

- Inspect boats, trailers and equipment and remove any plants, sediment, and animals (see illustration below).
- Drain, on land, all water from the motor, livewell, bilge and transom well. Some invasives may not be visible to the naked eye.
- Empty your bait bucket on land to help prevent the spread of invasive species and fish diseases.



Source: Minnesota Department of Natural Resources

## ■ After Leaving the Boat Launch

- Wash boats, tackle, trailers and other equipment to kill any exotic species not visible at the boat launch. This can be done with 104° tap water or a high-pressure sprayer. Or, you should dry all equipment for at least five days before moving to another body of water—some invasives can survive for long periods of time out of water.
- If you have used your watercraft on the Great Lakes, where a fish disease called viral hemorrhagic septicemia has spread, disinfect the outside and inside of your watercraft and your gear after using them. Mix 1 cup bleach in 10 gallons of water and brush/mop boat and trailer surfaces. Test dilute bleach solution in an inconspicuous location prior to applying to the entire watercraft and trailer. Keep the surface wet for five minutes, then rinse with clean water. Disinfection should occur away from lakes and rivers because chlorine is toxic to aquatic life.
- Learn what these organisms look like and know which waterways are infested. Report any new infestation to the Illinois-Indiana Sea Grant or the Indiana Department of Natural Resources.



# EXOTIC & NUISANCE AQUATIC SPECIES

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- Help prevent the spread of invasive species and fish diseases by not transferring fish, fish eggs or other aquatic organisms between waterways. Private pond owners who fish on Indiana waters or another state's waters would also benefit from the same advice.
- Talk with the Indiana Department of Natural Resources' Division of Fish and Wildlife at (317) 232-4080 and the Illinois-Indiana Sea Grant at (847) 872-8677 for further recommendations on controlling the spread of aquatic invasive species and any permit requirements before applying any control methods.

## Best Management Practices for Marina Owners/Operators

- Use approved herbicide treatments to control purple loosestrife and phragmites;
- Actively distribute aquatic invasive species information to patrons;
- Prominently display aquatic and invasive species prevention signage at boat ramps;
- Provide power washing facility for patrons to use; and
- Implement controls on submersed aquatic invasive species plants within marina basin.

By following these simple steps, both marina owners/operators and boaters can help protect our waters from aquatic invasive species and ensure that our aquatic resources remain enjoyable for future generations.



Close up of zebra mussels on a stick  
(Source: S. van Mechelen, University of Amsterdam, The Netherlands)

### For More Information

Preventing the spread of aquatic invasive species:  
[www.protectyourwaters.org](http://www.protectyourwaters.org)

Invasive species:  
[www.IN.gov/dnr/3123.htm](http://www.IN.gov/dnr/3123.htm)

Illinois-Indiana Sea Grant:  
[www.iisgcp.org](http://www.iisgcp.org) or  
call (847) 872-8677

**Appendix L** – (pages 193-196)  
Additional Contact Information



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