



## WISCONSIN DEPARTMENT OF NATURAL RESOURCES NOTICE OF FINAL GUIDANCE & CERTIFICATION

*Pursuant to ch. 227, Wis. Stats., the Wisconsin Department of Natural Resources has finalized and hereby certifies the following guidance document.*

**DOCUMENT ID WT-19-0015**

**DOCUMENT TITLE FISH PASSAGE GUIDANCE**

**PROGRAM/BUREAU WATERWAYS PROGRAM**

**STATUTORY AUTHORITY OR LEGAL CITATION WIS. STAT. CH. 30**

**DATE SENT TO LEGISLATIVE REFERENCE BUREAU (FOR PUBLIC COMMENTS) 9/2/19**

**DATE FINALIZED 10/21/19**

### DNR CERTIFICATION

*I have reviewed this guidance document or proposed guidance document and I certify that it complies with sections 227.10 and 227.11 of the Wisconsin Statutes. I further certify that the guidance document or proposed guidance document contains no standard, requirement, or threshold that is not explicitly required or explicitly permitted by a statute or a rule that has been lawfully promulgated. I further certify that the guidance document or proposed guidance document contains no standard, requirement, or threshold that is more restrictive than a standard, requirement, or threshold contained in the Wisconsin Statutes.*

10/11/19

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Signature

Date



**Bureau of Fisheries Management  
Bureau of Water Quality  
Bureau of Watershed Management**

**PROGRAM GUIDANCE**

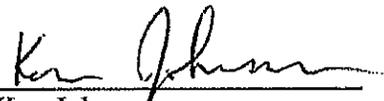
**Fish Passage Guidance**

Effective January 1, 2014

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APPROVED:

  
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12/16/2013  
Date

*Notified Waterways Policy and Management Team – January, 2014.*

## **SUMMARY**

This program guidance establishes criteria staff should use when reviewing regulated activities that have the potential to increase the distribution of aquatic invasive species (AIS) or fish pathogens. This guidance also provides direction to staff on when additional review of a preliminary decision may be appropriate.

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### **A. Statement of Problem Being Addressed**

Many benefits of fish passage are well documented and Wisconsin has been active in fish passage improvement projects including dam removals, perched and undersized culvert replacement, fish ladder construction, and capture and transfer operations. Evaluations of these activities generally show at least some movements of target species, improvements in fish species diversity in upstream areas, and/or successful reproduction and restoration of target species in upstream areas. However the potential negative impacts of allowing invasive species or pathogens are also well documented, and in at least some cases fish passage projects have been designed to eliminate the risk of upstream AIS movement. Examples include the construction of the sea lamprey barrier on the Iron River during the removal of the Orienta Dam in Bayfield County, and the successful restoration of naturally reproducing lake sturgeon on the Wolf River through capture and transfer above the Shawano Paper Mill Dam in Shawano County and the Menominee Indian Reservation.

The common denominator in these and other emerging fish passage issues, is that WDNR does not have any formal guidance or procedures for making a Department permit or management decision regarding AIS and pathogen movement as part of a fish passage action or other regulated activities. There are no manual code or program handbook policies, and applicable Wisconsin statute and administrative code is more general. Control of and preventing the spread of AIS is clearly supported in statute (Wis. Stats. s 23.22 Invasive Species, s. 31.30 Dams on the Brule River, and 237.10 Rapide Croche Lock) and administrative code (Wis. Admin. Code Chapter NR40 Invasive Species) -- but these are either general or very specific in their application. The Department has clear authority to require fish ways or fish ladders (Wis. Stats. s. 31.02 (4)) but a 1999 budget amendment required the Department to promulgate administrative rules governing placement of fish ways and fish ladders and cost sharing for dam owners. To date, the Department has not completed its rulemaking requirement.

### **B. Background**

Recently the federal government has either increased or planned to increase funding for Great Lakes habitat projects, and it is expected that dam removals or fish passage projects may become more common. Given, the potential difficulty of balancing population and ecosystem improvements with the negative impacts of AIS and pathogen invasions, it is important that the Department has a clearly defined and transparent process for reviewing these actions and making permit and management decisions.

Dam removals and fish passage improvements are currently popular river management activities that in many cases can improve fisheries, water quality and habitat. However, habitat and

population losses from AIS or pathogen invasions could more than offset such improvements. Currently there are literally millions of dollars being invested in dam removals and fish passage improvements in Wisconsin which will open extensive riverine areas to fish migration and potential AIS and pathogen infestation.

Generally anglers and other river users and riparian owners have a stake in both improved fisheries and aquatic ecosystems or the negative effects of AIS or pathogen invasions. Federal, state and local units of government have invested millions of dollars in dam removals and fish passage facilities, and in ongoing research and planning for future projects. Power companies and other dam owners are often the responsible parties when fish passage or dam removal is required under a permit or license decision.

### **C. Discussion**

The Department of Natural Resources will promote, encourage and approve regulated activities that will connect segregated fish populations or communities when those activities are in the public's interest and expansion of aquatic invasive species, and fish pathogens (including VHS) can be prevented, mitigated or deemed insignificant (no significant impact on the public interests).

This guidance is intended to assist Department staff in their review of regulated activities that have the potential to increase the distribution of aquatic invasive species and or fish diseases. Department staff review Chapter 30 and 31 permit applications, 401 Water Quality Certifications and manual code approvals. Regulated activities may include dam (installation, operation, removal, modification or drawdown of the impoundment), culvert (installation, replacement), miscellaneous structures, connected enlargements, diversions and other regulated activities.

Dam, culvert or diversion projects proposed to address immediate public safety needs will not be expected to address AIS or fish pathogens. Projects that are being done to address a public safety need, and can be planned for in advance should consider ways of minimizing or eliminating the potential to allow AIS or fish pathogens to cross the barrier, or be moved to a new waterway.

This guidance does not specifically address downstream movement of AIS since an applicant's ability to prevent the downstream movement of AIS is severely limited and more than likely if AIS is found upstream it is already found downstream.

### **D. Authority**

The Department of Natural Resources has the following legal authority to regulate activities that could involve fish passage (Table 1);

Areas for Legal Guidance	Specific Action	Statute or Code	Department's Position
<b>I. Department Authority to Regulate Fish Passages.</b>	<i>Ordering Fish Passages</i>	Wis. Stat. § 31.02(4)(c)	Department must promulgate rules “specifying the rights held by the public in navigable waters that are dammed,” including “provisions on the rights held by the public that affect the placement of fish ways or fish ladders that are dammed.” NR 40 considerations should be incorporated into this rule.
	<i>NR 40 Invasive Species Regulation</i>	Wis. Admin. Rule NR 40	Where a barrier prevents the upstream movement of a non-native fish species, “removal” of the barrier <b>may</b> constitute an “introduction” of the species, which is a regulated activity under NR 40. BMP’s could be developed to exempt this provision. Staff should work with Legal Services when considering NR 40. Other permits or approvals may exempt the need to obtain a NR 40 permit (See Appendix 1.).
<b>II. Department Authority to Regulate Dams.</b>	<i>Direct Regulation of Dams</i>	Wis. Stat. § 31	The Department may require dam owners to comply with conditions the Department determines are reasonably necessary “to preserve public rights in navigable waters, to promote safety and to protect life, health and property.” Public rights include fishing, natural scenic beauty, and environmental quality. Ch. 31 permit may eliminate the need to obtain a NR 40 permit. Work with Legal Services to evaluate the need for both permits.
	<i>FERC Dams: Water Quality Certification for Federally Licensed Dam Projects and additional Department involvement.</i>	401 Water Quality Certification (NR 299.04)	Dam owner must obtain a Water Quality Certification (NR 299.04) from the Department. This requires the Department to consider the public interests and rights delineated in Ch. 30 and Ch. 31. A federally authorized tribe may also require a WQC.
	<i>Navigable Waters, Harbors, and Navigation</i>	Ch. 30	Permits are needed to place, remove, or modify structures on the bed of navigable waterways. This requires the Depart. to consider the public interests and rights delineated in Ch. 30. A Ch. 30 permit may remove the need to obtain a NR 40 permit. Staff should work with Legal Services.

<b>III. Circumstances in Which a Fish Health Certificate May Be Required.</b>	<i>Introduction of Fish or Eggs into the Waters of the State</i>	Wis. Admin. Code ATCP § 10.63	A Fish Health Certificate (FHC) is always required when fish or eggs are introduced into the “waters of the state” from another state, or private source. The project applicant should work with the DATCP to determine if their proposed project requires a FHC.
	<i>Reintroduction of Fish or Eggs into Original Wild Source</i>	Wis. Admin. Code ATCP § 10.655(1)	A FHC is not required when fish/eggs are collected from and later reintroduced into the same lake or at the same point or a downstream point on a river/stream. Must also meet 5 criteria (See appendix 2).
	<i>Upstream Movement through Passive Fish Passages</i>	No statute or code specifically addresses this	The project applicant should work with DATCP to determine if a Fish Health Certificate is required.
	<i>Upstream Movement through Active Fish Passages</i>	No statute or code specifically addresses this	The project applicant should work with DATCP to determine if a Fish Health Certificate is required.

Table 1. State authority to regulate activities that could involve fish passage.

**E. Guidance**

Department staff will incorporate AIS and fish pathogen risk assessments into the existing permit review process when making decisions on Ch. 30/31 permit applications, 401 Water Quality Certifications or manual code approvals.

Proposed Fish Passage at a Complete Barrier

Department staff will follow the guidelines in table 2, when evaluating **projects that are specifically being proposed to increase fish passage at a complete barrier** (See appendix 3 for definitions).

1	*No <u>passive fish passage</u> at complete barriers where <b>VHS</b> is found or suspected (Watched Waters) downstream but not upstream.
2	*No <u>passive fish passage</u> at a complete barrier when an AIS is found downstream but not upstream.
3	Passage allowed using a <u>trap and sort facility or capture and transfer operation</u> , when <b>VHS</b> is found or suspected downstream, but not upstream of a complete barrier when a fish health certificate is obtained prior to passing VHS susceptible fish species.
4	Passage allowed using a <u>trap and sort facility or capture and transfer operation</u> , when an <b>AIS</b> is present downstream but not upstream of a complete barrier following risk and public interest assessment.
5	No passage (passive or active) where proposed barrier is located at a natural complete barrier.

Table 2. Summary of staff guidance for fish passage at complete barriers.

\*Note: While highly unlikely, a proposal to pass fish around a complete barrier through a passive passageway where VHSv and or AIS are downstream may provide sufficient safeguards to be allowed.

Staff should consider the ability of AIS or fish pathogens to reach the complete barrier in question when using the guidance listed in table 2. If a complete barrier (dam, waterfalls, etc.) exist below the structure in question but upstream of the documented (based upon specific surveys for AIS or pathogens) presence of an AIS or fish pathogen the guidance in table 2 may be modified. Staff should document the reasons for diverging from the guidance identified in table 2. Staff should not use guidance in table 2 for projects involving incomplete barriers. Staff should also not use the table 2 guidance if the proposed project is for dam removal.

#### Risk Assessment and Public Interest Test at Incomplete or Complete Barriers

Department staff shall consider the following factors when determining if a regulated activity that could result in an increase in the passage, movement or transfer of aquatic invasive species or fish pathogens upstream of an existing or proposed barrier (**Incomplete barrier or a complete barrier not being modified specifically for fish passage**) should be approved, denied or approved with modifications;

1. Determine the Aquatic Invasive Species (AIS) of Concern. Department staff shall use species lists that are contained in the Great Lakes Mississippi River Interbasin Study (GLMRIS) and other resources to determine the AIS of concern (See appendix 4 for AIS (fish) that should be considered at a minimum).
2. Determine the proximity of AIS of concern to the barrier in question.
3. Determine if the AIS of concern can survive transit to barrier in question.
4. Determine if the AIS of concern can become established at the barrier in question.
5. Determine if the AIS of concern can cross the barrier in question.
6. Determine if the AIS of concern can become established above the barrier in question.
7. Determine the impact of all species (native and AIS) transferred above the barrier will have on the public interests (Ecologic, Economic, Recreation and Aesthetic) in the waterway.

Staff should determine the level of risk for each of the above factors and for each AIS of concern before making a decision on the proposed activity. Table 3, identifies the criteria that will aid staff in determining if the risk is low, medium or high. Following the assessment of risk, the project review team will assess the impact of increasing passage of not only medium and high risk AIS, and fish pathogens but native species on the public interests which includes; ecological health, economics, recreation, and aesthetics.

While there are no quantitative standards to assess the impact a proposed project will have on the public's interest's staff should consider the following when reviewing the proposed project;

- Commercial and recreational navigation
- Water quality
- Fishing and hunting
- Swimming
- Enjoyment of natural scenic beauty
- Other recreational enjoyment on water or ice and
- Effects the proposed project would have on the economics associated with the waterway.

For a water of which any portion upstream of the proposed passage flows through the Ceded Territory, staff should work with the Department's treaty rights attorney to determine whether legally-binding consultation with the Chippewa Tribes is triggered. If the attorney determines consultation has not been triggered, staff should nonetheless work with the Department's tribal liaison to determine if discretionary outreach to the Chippewa Tribes may still be advisable. For a water of which any portion upstream of the proposed passage passes through a reservation, regardless of location, tribal outreach (which is different than consultation) is advised. Staff should work with the Department's tribal liaison to take appropriate action.

Based upon the risk of passing high and medium risk AIS and the impact on the ecology of the waterway, economy, aesthetics, and recreational value a regulatory decision should be made.

The form in appendix 5 should be used by the project review team to document the risk that is assigned to each AIS of concern.

The form in appendix 6 should be used by the project review team to summarize the level of risk of passing AIS and the overall impact on the ecology, economy, aesthetics and recreational value of the project (AIS and native species) on the waterway. This table should summarize risk, impact on the public interest and lead to a decision to approve, deny or approve the project with modifications.

Additional review of a proposed decision may be conducted by the Bureau of Watershed Management when;

- a. When stakeholder requests administration's involvement
- b. When political concerns arise
- c. When legal or programmatic policy and the guidance conflict
- d. When the proposed regional decision is inconsistent with statewide guidance
- e. When guidance does not address circumstance
- f. When a region requests it
- g. When regulatory decision is to deny request (e.g. fish passage, etc.)

Under any of the above circumstances the region or central office may request that the proposal receive additional review prior to making a final decision within the timelines established by policy, code or statute. Requests for additional review will result in a coordinated effort directed by the Bureau of Watershed Management (Director). The Director may seek input from additional programs (e.g. Fish Management, Water Quality, Legal Services, Science Services, etc.) standing teams, Department experts, external experts, Tribes and other state or federal agencies (e.g. DATCP, USFWS, FERC, etc.).

All reviews will be made within the timelines established by policy, code or statute unless otherwise agreed to by the applicant and the Department.

Risk Category	High Risk Criteria	Medium Risk Criteria	Low Risk Criteria
Determine the proximity of AIS of concern to the barrier in question.	AIS are already common in the basin with the barrier in question.	AIS are in the basin but not broadly.	AIS not present in the basin.
Determine if the AIS of concern can survive transit to barrier in question.	AIS that can survive transit to the barrier.	AIS that can survive transit to the barrier seasonally	AIS that cannot survive transit to the barrier
Determine if the AIS of concern can become established at the barrier in question.	AIS that can become established year round at the barrier	AIS that can become established temporarily or seasonally at the barrier	AIS that cannot become established at the barrier
Determine if the AIS of concern can cross the barrier in question.	Proposed modification increases or maintains AIS passage at a frequent occurrence (1 – 10 year event).	Proposed modifications result in an increase, decrease or maintains AIS passage at an infrequent occurrence (10 – 99 year event).	Proposed modifications result in the elimination of AIS passage or maintains no passage.
Determine if the AIS of concern can become established above the barrier in question.	AIS that are able to establish a reproducing, sustainable population upstream of barrier	AIS that are able to survive but not establish a sustaining population upstream of the barrier	AIS that are unable to survive or become established

Table 3. Criteria used to determine risk for each species of AIS.

## Data and Documentation

Having adequate quantifiable, objective and scientific information to make accurate assessments of risk and impact is critical in this process. The physical, chemical and biological needs of every life stage should be considered. The species ability to swim, leap, and climb should also be considered. In addition to the physical abilities of the species, the barrier or barriers in question should also be thoroughly researched. When a project involves a dam the project review team should understand the flood capacity of the structure, structural height, tail water elevation, depth of scour pool and other critical physical characteristics that may influence a species ability to cross the barrier. The upstream habitat and water quality should also be known to better determine the likelihood of a species ability to become established. It is unlikely that all the information a project review team will need to assess risk or impacts to the economy, ecology, aesthetics or recreational value of the waterway will be readily available due to the “newness” of an AIS or fish pathogen. Information on the structure(s) may also not be readily known. The Water Management Specialist should request additional information from the applicant when the project review team needs additional information to make a risk assessment or economic, ecological, aesthetic and recreational analysis.

The following section provides some additional information on the type of information staff should use when evaluating risk for each of the five categories in table 3.

### **Determine the proximity of AIS of concern to the barrier in question.**

At a minimum staff should use the AIS listed in appendix 4 to determine if an AIS is present in the basin (Great Lake or Mississippi River). This information should be confirmed through the use of additional resources (USGS website, personal communication with professionals, survey results, etc.) Additional information should also be used if other AIS are not listed in appendix 4. All information used should be documented in appendix 8.

### **Determine if the AIS of concern can survive transit to barrier in question.**

Staff should examine the existing barriers (manmade and natural) to determine if AIS are prevented from reaching the barrier in question. Information may include conversations with other professionals, survey results, personal knowledge of the barriers, or other sources. All sources of information should be documented in appendix 8.

### **Determine if the AIS of concern can become established at the barrier in question.**

Staff should determine if the habitat and water quality/quantity conditions exist at the barrier to enable the species to have a sustaining population at the barrier. Literature searches may be needed to determine this. In addition, professional conversations with experts and any survey information should be documented. All sources used should be documented in appendix 8.

### **Determine if the AIS of concern can cross the barrier in question.**

Determining if AIS of concern has the ability to cross a barrier is perhaps the most complex and difficult assessment to make as a biologist. Ideally the biologist will be able to rely upon professional knowledge of a species, and have all the information needed to make a decision but more often staff may have to rely upon literature searches or personal communications with other professionals. The project review team should request the applicant to provide necessary information to address this assessment if it is not readily available elsewhere.

Determining the level of risk in this category is based upon the expected change presented by the proposed regulated activity. If the expected frequency of passage is increased the risk becomes higher, if the frequency is lowered the risk becomes lower. This requires an assessment of the existing condition and the proposed condition (e.g. project is implemented).

There are three categories of risk, all based upon the frequency of the structure being passed by AIS or pathogens. A complete barrier (Prairie du Sac Dam, St. Croix Falls Dam, etc.) pose an impassible barrier to AIS (and native species) unless there is human intervention. If unmodified the risk of AIS passing a complete barrier is low. A barrier that would allow infrequent (10 – 99 year event) passage of AIS is considered to be a medium risk barrier and a barrier that is frequently passed (less than 10 year event) by AIS or pathogens is considered to be a high risk barrier. The proposed regulated activity may increase or decrease the frequency of passage and it is this change that determines the level of risk of a specific species.

The following examples are intended to be hypothetical and should be used only to better understand the issue of changing the risk of passage.

#### Example 1. Complete barrier

A proposal to install a fish elevator with trained staffed sorting species at the top of the barrier is under review by the project review team. There are ten AIS of concern identified in the basin and need to be examined for their ability to cross the barrier. Under existing conditions (no elevator) the risk of any of the ten AIS crossing the barrier is low. Under the proposal the risk of an AIS crossing the barrier may be viewed as slightly higher but arguably still low and some species may not even be able to use the elevator so the risk for those species remains the same as the pre-elevator risk.

#### Example 2. Incomplete barrier (10 – 99 year event) with passive fish passage.

The project review team is considering a passive fish passage proposal at a medium risk barrier. The passage would target the passage of game fish (walleye, and northern pike) and enable passage during seasonal spawning events. The pre-proposal risk is considered to be medium, however there are six of eight AIS that could move upstream year round as a result of the passive fish passage and would be able to become established upstream. Therefore the risk for the six AIS would be increased to high.

#### Example 2a. Incomplete barrier (10 – 99 year event) with passive fish passage and adaptive management.

In example 2, the risk of AIS passage may be reduced if the passive fish passage could be closed during non-spawning periods, thereby reducing usage by AIS and pathogens. The risk may remain medium for all six species depending upon the effectiveness of the adaptive management plan.

Example 3. Incomplete barrier (1 – 10 year event)

A dam that is frequently over topped is being proposed to be drawn down for maintenance. Under the current condition the risk of passing AIS and pathogens is considered high. The risk will remain high during the draw down unless measures to reduce AIS movement are implemented. If a temporary electrical barrier is installed downstream during the maintenance period the risk could be reduced to medium.

**Determine if the AIS of concern can become established above the barrier in question.**

Staff should rely upon professional knowledge of the resource and AIS of concern to determine if it can become established above the barrier. All life stages need to be considered in this assessment. If staff are unfamiliar with resource requirement of the AIS of concern, literature searches, and conversations with other professionals should be used to determine resource needs of the species. These sources should be documented in appendix 8.

## Appendix 1.

Criteria used to exempt a project from NR 40 when regulated by another permit.

NR 40.06(7). A person who holds a permit or approval issued by the department under another chapter or a statute other than s. 23.22, Stats., is not required to hold a permit under this chapter to transport, possess, transfer or introduce a prohibited invasive species listed in s. NR 40.04(2), or a restricted invasive species listed in s. NR 40.05 (2), if the department determines that all of the following apply:

(a) The permit or approval expressly authorizes the transportation, possession, transfer or introduction of the prohibited invasive species listed in s. NR 40.04 (2), or the restricted invasive species listed in s. NR 40.05 (2).

(b) The permit or approval includes legally enforceable requirements that are at least equivalent to those that would be contained in a permit issued by the department under this chapter.

(c) The person is not in violation of the permit or approval.

## Appendix 2.

Criteria used to exempt requirement of obtaining a Fish Health Certificate when fish or fish eggs are removed and reintroduced.

A fish health certificate is not required when fish or fish eggs are removed from and later reintroduced into the same lake from which they were collected, or to the same point or a downstream point in the same river system from which they were collected, but only if all of the following criteria are met:

1. The state veterinarian or designee issues a permit authorizing reintroduction under Wis. Admin. Code ATCP 10.065(2);
2. The Department approves reintroduction in writing;
3. Reintroduction is designed to increase or rehabilitate a population of desirable sport fish species;
4. The fish or eggs are reintroduced within 30 days of collection, or within 30 days of offsite hatching, whichever is later and;
5. The fish or eggs are not comingled with fish or eggs from any other source.

## Appendix 3.

### Definitions.

**Active Fish Passage** – A constructed pathway which can be used by fish with assistance from humans to move around a (manmade or natural) barrier (e.g. Trap and sort).

**Capture and Transfer** – An operation to capture desired fish or other aquatic species below an existing barrier and physically transfer (by truck, boat or other means) for release into the same river or stream above the barrier.

**Complete Barrier** – A man made or natural structure which does not allow the migration of aquatic organisms upstream up to the 100 year event.

**Incomplete Barrier** - A man made or natural structure which allows the migration of aquatic organisms upstream during events less than the 100 year event.

**Passive Fish Passage** – A constructed pathway which can be used by fish to move freely upstream and around an existing (manmade or natural) barrier without human assistance (e.g. Fish ladder).

**Project Review Team** – A team of Department staff needed to determine the risk and impact a proposed regulated activity will have on the public interests of the waterway. The team may consist of a Water Management Specialist, Fishery Biologist, Wildlife Biologist, Water Resource Management specialist, Endangered Resources Specialist, and others.

Appendix 4.  
List of Aquatic Invasive Fish Species in Great Lake and Mississippi River Basin

SCIENTIFIC NAME	COMMON NAME	NATIVE RANGE	BASIN**
<i>Alosa aestivalis</i>	Blueback herring	Atlantic slope	GL
<i>Alosa chrysochloris</i>	Skipjack herring	Mississippi River Basin /Gulf Slope	MS
<i>Alosa pseudoharengus</i>	Alewife	Atlantic Slope	GL
<i>Ameiurus catus</i>	White catfish	Atlantic & Gulf Slope	BOTH
<i>Apeltes quadracus</i>	Fourspine stickleback	Atlantic Slope	GL
<i>Carassius auratus</i>	Goldfish	Asia	BOTH
<i>Carassius carassius</i>	Crucian carp	Asia	MS
<i>Channa argus</i>	Northern snakehead	Asia	MS
<i>Channa marulius</i>	Great snakehead	Asia	MS
<i>Cichlasoma nigrofasciatum</i>	Convict cichlid	Central & South America	MS
<i>Chichlasoma octofasciatum</i>	Jack Dempsey	Central America & Mexico	MS
<i>Ctenopharyngodon idella</i>	Grass carp	Asia	BOTH
<i>Cyprinus carpio</i>	Common carp	Asia	BOTH
<i>Dorosoma petenense</i>	Threadfin shad	Mississippi River Basin/Atlantic & Gulf Slope	MS
<i>Enneacanthus gloriosus</i>	Bluespotted sunfish	Atlantic & Gulf Slope	GL
<i>Gambusia affinis</i>	Western mosquitofish	Mississippi River Basin/Atlantic & Gulf Slope	BOTH
<i>Gasterosteus aculeatus</i>	Threespine stickleback	Northern Pacific, Atlantic & Arctic Oceans	GL
<i>Gymnocephalus cernuus</i>	Eurasian ruffe	Eurasia	GL
<i>Hypophthalmichthys molitrix</i>	Silver carp	Asia	MS
<i>Hypophthalmichthys nobilis</i>	Bighead carp	Asia	MS
<i>Ictalurus furcatus</i>	Blue catfish	Mississippi River Basin/Rio Grande	MS
<i>Lepisosteus platostomus</i>	Shortnose gar	Mississippi River Basin	BOTH
<i>Lepomis microlophus</i>	Redear sunfish	Mississippi River Basin/Atlantic & Gulf Slope	BOTH

SCIENTIFIC NAME	COMMON NAME	NATIVE RANGE	BASIN**
<i>Menidia beryllina</i>	Inland silverside	Mississippi River Basin/Atlantic & Gulf Slopes, Mexico	MS
<i>Lepomis auritus</i>	Redbreast sunfish	Atlantic & Gulf Slopes	MS
<i>Lepomis microlophus</i>	Redear sunfish	Mississippi River Basin/Atlantic & Gulf Slope	BOTH
<i>Menidia beryllina</i>	Inland silverside	Mississippi River Basin/Atlantic & Gulf Slopes, Mexico	MS
<i>Misgurns anguillicaudatus</i>	Oriental weatherfish	Asia	BOTH
<i>Morone americana</i>	White perch	Atlantic Slope	BOTH
<i>Morone saxatilis</i>	Striped bass	Atlantic Slope & Gulf Slopes	BOTH
<i>Mylopharyngodon piceus</i>	Black carp	Asia	MS
<i>Neogobius melanostomus</i>	Round goby	Europe	BOTH
<i>Notropis buchanani</i>	Ghost shiner	Mississippi River Basin/Gulf Slope	BOTH
<i>Noturus insignis</i>	Margined madtom	Atlantic Slope	GL
<i>Oncorhynchus gorbuscha</i>	Pink salmon	Pacific Slope, Arctic Drainage	GL
<i>Oncorhynchus kisutch</i>	Coho salmon	Pacific Slope, Arctic Drainage	GL
<i>Oncorhynchus mykiss</i>	Rainbow trout	Pacific Slope	BOTH
<i>Oncorhynchus nerka</i>	Kokanee (Land-locked Sockeye)	Pacific Slope, Arctic Drainage	GL
<i>Oncorhynchus tshawytscha</i>	Chinook salmon	Pacific Slope, Arctic Drainage	GL
<i>Oreochromis niloticus</i>	Nile tilapia	Africa	MS
<i>Osmerus mordax</i>	Rainbow smelt	Arctic, Atlantic, Pacific Drainages	BOTH
<i>Petromyzon marinus</i>	Sea Lamprey	Northern Atlantic & Mediterranean Sea	GL
<i>Phenacobius mirabilis</i>	Suckermouth minnow	Mississippi River Basin/Gulf Slope	BOTH
<i>Powcilia mexicana</i>	Shortfin molly	Mexico	MS
<i>Poecilia sphenops</i>	Mexican molly	Central & South America	NR*
<i>Proterorhinus semilunaris</i>	Tubenose goby	Europe	GL
<i>Pterygoplichthys disjunctivus</i>	Vericulated sailfin catfish	South America	MS
<i>Pterygoplichthys pardalis</i>	Amazon sailfin catfish	South America	MS

SCIENTIFIC NAME	COMMON NAME	NATIVE RANGE	BASIN**
<i>Salmo salar</i>	Atlantic salmon	Atlantic Slope	GL
<i>Salmo trutta</i>	Brown trout	Europe	BOTH
<i>Sander lucioperca</i>	Zander	Euorpe	MS
<i>Scardinius erythrophthalmus</i>	Rudd	Europe	BOTH
<i>Tinca tinca</i>	Tench	Eurasia	MS
<i>Xiphophorus hellerii</i>	Green swordtail	Central America & Mexico	MS
<i>Xiphophorus maculatus</i>	Southern platyfish	Mexico & South America	MS

\*Although in one basin, did not move on due to not utilizing an aquatic pathway.

\*\*"Basin" identifies which basin the species has been recorded from. MS = Mississippi River; GL = Great Lakes

For complete AIS list go to: <http://glmris.anl.gov/documents/ans/index.cfm>

## Appendix 5. Risk Assessment Evaluation Form

List AIS of Concern				
Swimmer – (e.g. fish, fish disease)				
Floater – (e.g. plankton)				
Sitter – (e.g. mollusk)				
Other – (e.g. fish disease)				
	High Risk	Medium Risk	Low Risk	Unknown Risk
Proximity to barrier	Enter species that are established (common) in the basin (e.g. Common carp) but not above the barrier	Enter species that are in the basin but not broadly established (e.g. Asian carp)	Enter species that are not currently in the basin	Enter species that have an unknown status in basin
Ability of AIS to survive transit to barrier? (Are there complete barriers downstream blocking movement, sufficient habitat to support species?)	Enter species that can survive transit to the barrier	Enter species that can survive transit to the barrier seasonally	Enter species that cannot survive transit to the barrier	Enter species whose ability to survive transit is unknown
Ability of AIS to become established at barrier	Enter species that can become established year round at the barrier	Enter species that can become established temporarily or seasonally at the barrier	Enter species that cannot become established at the barrier	Enter species whose ability to become established at the barrier is unknown
Ability of AIS to cross barrier	Enter species capable of passing when proposed modification increases or maintains passage at a frequent occurrence (1 – 10 year event)	Enter species capable of passing when proposed modifications result in an increase, decrease or maintains passage at an infrequent occurrence (10 – 99 year event)	Enter species prevented from passing when proposed modifications result in an elimination of passage or maintains no passage	Enter species that have an unknown ability to cross the barrier
Ability of AIS to become established upstream of barrier	Enter species that are able to establish a reproducing, sustainable population upstream of barrier	Enter species that are able to survive but not establish a sustaining population upstream of the barrier	Enter species that are unable to survive or become established	Enter species with an unknown ability to become established upstream of barrier
AIS with high, medium and low risk.	List of AIS with all high risk rankings	List of AIS with lowest risk ranking of medium	List of AIS with at least one low risk ranking	List AIS that have an unknown risk ranking.





Appendix 7. Risk Assessment and Public Interest Analysis Summary Form

<b>Summary – Considered for high, and medium risk AIS and native species.</b>			
<b>Regulated Activities</b>	<b>Risk of passing AIS will; (Increase, Decrease, or Stay the Same)</b>	<b>Overall Impact on; ecology, economics, aesthetics, and recreation (Positive, No change, Negative)</b>	<b>Regulatory Decision (Approve, Deny, Approve with conditions)</b>
Construction of new barrier			
Modification of an existing barrier; <input type="checkbox"/> Operating procedures <input type="checkbox"/> Improve safety of barrier <input type="checkbox"/> Increase flood capacity <input type="checkbox"/> Other <input type="checkbox"/> Fish Passage project at; <input type="checkbox"/> Complete barrier <input type="checkbox"/> Incomplete barrier			
Replace barrier (e.g. culvert, dam)			
Remove Barrier			
Other (e.g. temporary drawdown, Barrier Maintenance – No Changes, Diversion, etc.)			
<b>Barrier being considered:</b>			

Appendix 8  
Documentation of Resources Used

A goal of this guidance is to improve documentation of Department decisions. Staff should document the information used to make a decision on a proposed project. The following should be used by staff to document they type, and source of information used. Please cite literature sources completely.

**Authority**

1. Please identify what authority the Department is using to evaluate this proposed project (e.g. Chapter 30 or 31, 401 Water Quality Certification, Manual Code Approval)

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**Risk Assessment**

2. What resources were used to determine the AIS of concern?

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3. What information was used to determine the proximity of the AIS to the barrier in question?

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4. What information was used to determine if the AIS of concern can survive transit to the barrier?

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5. What information was used to determine if the AIS of concern can become established at the barrier in question?

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6. What information was used to determine if the AIS of concern can cross the barrier in question?

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7. What information was used to determine if the AIS of concern can become established upstream of the barrier in question?

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**Public Interest Analysis**

8. What information was used to determine the impact of all species (native and AIS) will have on the economic, ecological, recreational and aesthetic value of the resource?

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