

Scofield Reservoir Fishery Management Plan



Scofield Reservoir Advisory Committee

July 2017

Scotfield Reservoir Advisory Committee

A public advisory committee was formed on January 7, 2017. During the fall of 2016 the Utah Division of Wildlife Resources (UDWR) conducted an on-line survey to gather public input and perceptions regarding the fishery at Scotfield Reservoir. The final survey question asked respondents if they would be willing to serve on a committee to help develop a Scotfield Reservoir Management Plan. Committee members who indicated a willingness and desire to serve on the committee were chosen and asked to represent Utah anglers on the committee. Other committee members were selected to represent Scotfield area residents and cabin owners, the Utah Division of State Parks, and the Blue Ribbon Fisheries Council. Thus, the Scotfield Reservoir Advisory Committee consists of individuals representing varying interests, constituency groups, and angling types.

Committee members:

Doug Cloward, Scotfield Area Residents and Cabin Owners
Chad Gasser, Angler
Jared Hone, Angler
Jonathan Hunt, Utah Division of State Parks
Derris Jones, Southeastern Region Advisory Council
Mike King, Utah Wildlife Board (observer)
Tony Nelson, Angler
Tom Ogden, Angler
Ransford Sorensen, Angler
Dave Varner, Blue Ribbon Fisheries Council

Other committee participants:

Calvin Black, Utah Division of Wildlife Resources
Jordon Detlor, Utah Division of Wildlife Resources
Justin Hart, Utah Division of Wildlife Resources
Daniel Keller, Utah Division of Wildlife Resources
Ken Strong, Sportsmen for Fish and Wildlife

Advisory Committee Purpose and Mission

The purpose of the committee was to provide public input to the UDWR regarding sport fisheries management for Scotfield Reservoir and to help develop a long term plan for the fishery. The Committee determined its mission to *“Develop a sport fish management plan that will provide the Utah Division of Wildlife Resources with recommendations and direction to create a sustainable and high quality fishery at Scotfield Reservoir”*.

Constraints

All recommendations will consider the following:

1. Existing state and federal laws and policies

2. Life history/biology of fish species
3. Reduction and utilization of Utah chub, not eradication, is the desired outcome of changing the species composition in Scofield Reservoir
4. Limnology and morphometry of the reservoir
5. Downstream impacts to aquatic resources (i.e., Green River endangered species, Utah sensitive species like Flannelmouth and Bluehead sucker, and the Blue Ribbon Stream Fishery)
6. Current budgetary and funding constraints
7. Availability and compatibility of alternative fish species for stocking in accordance with the Stocking Procedures Agreement “Compatible Species List” (USFWS 2009 and 2015)
8. Public perceptions and expectations

Scofield Reservoir and Current Conditions

Scofield Reservoir is a high elevation (7,618 ft) impoundment on the Price River, eventually flowing to the Colorado River, located within the Manti-La Sal National Forest in Central Utah. The reservoir was created by the Scofield Dam in 1926 and is predominantly used for irrigation water storage, with angling, recreation, and flood control as additional benefits. The reservoir has a capacity of 73,600 acre-feet at full pool, mean surface area of 2,815 acres, and a mean depth of 25 feet (Bureau of Reclamation 2011). The Reservoir is operated by the United States Bureau of Reclamation (USBR) and shoreline lands are owned by a variety of entities (e.g., USBR, Utah Division of State Parks, Utah School Institution and Trust Lands Administration, the United States Forest Service, and various private property owners).

Historically, Scofield Reservoir has been managed as a basic yield (family) fishery with rainbow trout *Oncorhynchus mykiss* as the dominant species. The reservoir has a history of water quality issues related to water management (viz., low water), excess phosphorus loading, and low dissolved oxygen concentrations. These conditions can lead to periodic algal blooms and seasonal fish kills (both summer and winter). Scofield Reservoir is listed as impaired on the 303(d) list with total phosphorus and dissolved oxygen as the pollutants of concern (Department of Environmental Quality 2010). Scofield Reservoir has had a history of illegal introductions and fishery management challenges associated with non-native species. Rotenone treatments have occurred three times since the reservoir was built (1958, 1977, and 1991) to combat Utah chub *Gila atraria*, walleye *Sander vitreus*, and common carp *Cyprinus carpio*. After all treatments, stocking of rainbow trout and various strains of cutthroat trout occurred, and a basic yield (family) fisheries management philosophy was quickly reinstated.

In 2005, Utah chub *Gila atraria* were again documented in the reservoir for the first time in over a decade. As a result, tiger trout stocking began in 2005, a slot limit (15-22 inches) on tiger trout and cutthroat trout was implemented in 2009, and Bonneville cutthroat trout (Bear Lake strain) stocking was also initiated in 2009. Utah State University completed a two-year research project in 2013 assessing the effectiveness of the new, predator heavy, management strategy. The study suggested that Utah chub could effectively be controlled by tiger trout and cutthroat trout

predation by maintaining a given population size of adult predators (Budy et al. 2014). Based on gillnet surveys over the last several years, it appears the size structure of Utah chub has been shifted to a large (>10 inches) mean size (Black 2016). This indicates that Utah chub are being controlled and the adult population is in a state of senescence. However, the adult chub population constitutes such a large portion of the biomass, cessation of rainbow trout stocking occurred in 2014 because of interspecific competition and low return to the creel. Without a family friendly harvestable component to the fishery, angler satisfaction and use at the reservoir has steadily declined. Between 2005 and 2016 angling use at Scofield Reservoir has declined by nearly 70% (Hart and Birdsey 2006; UDWR unpublished data 2016).

Desired Condition and Species Assemblage

Based on the results of the online survey (Appendix I) and the discussion at the initial Scofield Reservoir Advisory Committee meeting, it is evident that change needs to occur in the fishery. All committee members expressed the need to reduce and control the Utah chub population, and agreed it was the most limiting factor in developing a quality fishery at Scofield Reservoir. Additionally, a harvestable, family friendly, component to the fishery needed to be regained as quickly as possible. Similarly, the existing trophy component that Scofield Reservoir currently contains with its cold water predators needs to be maintained, and ideally enhanced moving forward. It was also agreed upon that adding diversity to the fishery in the form of alternative fish species was desirable to the committee and the anglers of Utah. The UDWR as well as the Advisory Committee would like to regain the Blue Ribbon Fishery status at Scofield Reservoir and increase the economic benefits the fishery brings to the Utah Division of State Parks, the town of Scofield and nearby housing associations, and Carbon County.

Stocking Agreements and Escapement Prevention

In 2009, the wildlife management agencies of three states (UT, CO, and WY) within the upper Colorado River Basin (UCRB) and the U.S. Fish and Wildlife Service (USFWS) entered into an agreement which defined the Stocking Procedures for nonnative fish in the UCRB (USFWS 2009). In an ongoing effort to provide a balance of sustainable sportfishing opportunities with prevention of potential downstream impacts to Endangered Fish Recovery efforts: the signatories to the Stocking Procedures developed a list of “compatible” and “non-compatible” aquatic species for sportfish management (USFWS 2014 and 2015). Three species on the “compatible” list (sterile walleye, hybrid striped bass, and tiger muskellunge) require the use of screens or nets to prevent downstream escapement. The UDWR is committed to the prescribed use and development of the sterile predators which provide sportfishing opportunities and are important fisheries management tools.

Three of the species chosen for stocking into Scofield Reservoir are considered a threat to endangered fish in the UCRB if they reach riverine habitats (sterile walleye, hybrid striped bass,

and tiger muskellunge). Stocking of these species within the reservoir is contingent upon working towards the design and installation of a fish barrier to prevent escapement. The first step in preventing escapement will be for the UDWR to assess all available options. A viable solution will then be chosen and agreed upon with the applicable land and facilities management agencies. Finally, a construction and maintenance plan for the prevention option will be determined.

Goals for Management of Scofield Reservoir

1. Reestablish a family fishery and maintain a harvestable component to the fishery
2. Maintain and enhance trophy (quality) angling opportunities
3. Enhance the diversity of angling opportunities by adding alternative fish species
4. Reduce Utah chub numbers with a sustainable management model
5. Increase angling and recreational use at the reservoir
6. Manage Scofield Reservoir for compatibility with native species management as its outflow connects to the Price, Green, and Colorado Rivers

Objectives and Strategies for Scofield Reservoir Management Goals

Goal 1: Reestablish a family fishery and maintain a harvestable component to the fishery

Objective 1: Reinstate the stocking of rainbow trout utilizing a “larger” sized fish.

Strategies

- As Utah chub biomass is being reduced by methods described in Goal 4, stock 12-15 inch triploid rainbow trout. These larger fish are immediately available for angling harvest.
- Stock 10-50 triploid rainbow trout/acre, numbers based on availability within UDWR’s hatchery system and out of state purchases/trades.
- Maintain an angling catch rate ≥ 0.25 triploid rainbow trout/hour.
- Maintain an average gillnet catch rate of 10-15 triploid rainbow trout/net-night.

Objective 2: After Utah chub biomass is reduced reinstate the stocking of rainbow trout utilizing a “traditional” sized fish.

Strategies

- Once Utah chub biomass is reduced by methods described in Goal 4 (gill net catch rate ≤ 55 Utah chub/net-night), stock 8-11 inch triploid rainbow trout. These fish will be facing reduced competition for resources with Utah chub and will be capable of growth before angling harvest.
- Stock 50-250 triploid rainbow trout/acre.
- Maintain an angling catch rate ≥ 0.50 triploid rainbow trout/hour.
- Maintain an average gillnet catch rate of 15-20 triploid rainbow/net-night.

Objective 3: Utilize triploid walleye and striped bass hybrids (wipers) as part of the harvestable component to the fishery.

Strategies

- Even though these species may be used to help reduce Utah chub biomass as described in Goal 4, maintain standard statewide angling regulations to provide for angling harvest.
- Ensure adequate stocking rates to meet the needs described in Goals 1 and 4.
- Stock 5,000 to 12,500 triploid walleye fry/acre, numbers based on availability within UDWR's hatchery system and out of state purchases/trades (currently these fish are only available as fry).
- Stock 400 hybrid striped bass fry/acre, or 40 hybrid striped bass fingerlings (1-3 inch)/acre, numbers based on availability within UDWR's hatchery system and out of state purchases/trades.
- Maintain an average, combined gillnet catch rate of 5-9 sterile walleye and hybrid striped bass/net-night.

Goal 2: Maintain and enhance trophy (quality) angling opportunities

Objective 1: Continue the stocking and use of Bear Lake Bonneville cutthroat trout and tiger trout.

Strategies

- Retain the current regulations for these two species. All cutthroat and tiger trout between 15 and 22 inches must be immediately released, no more than two cutthroat or tiger trout under 15 inches may be kept, and no more than 1 over 22 inches may be harvested.
- Stock 25-50 subcatchable size (6-8 inch) Bear Lake Bonneville cutthroat trout and tiger trout/acre at a 1:1 to 2:1 ratio (cutthroat trout to tiger trout).
- Maintain an average, combined gillnet catch rate of 10- 15 cutthroat and tiger trout/net night with 50% of the catch exceeding 12 inches.
- Educate anglers that this regulation is necessary to suppress Utah chub numbers and must remain in place moving into the future.

Objective 2: Utilize triploid walleye and striped bass hybrids (wipers) as a trophy opportunity.

Strategies

- During the initial stages of Utah chub control, it is likely to produce trophy opportunities in either of these species.
- Educate anglers that this trophy opportunity may be short lived and not sustainable once the majority of senescing (adult) Utah chub are gone.
- Utilize the UDWR Outreach Section to help publicize outstanding angling opportunities when they exist, utilizing local news outlets, television, internet, and social media.

- Stocking rates defined in Goal 1, Objective 3.

Objective 3: Utilize tiger muskellunge as a trophy opportunity.

Strategies

- Stock a conservative number of tiger muskellunge (≤ 2.5 fish/acre based on a fingerling size) numbers based on availability within UDWR's hatchery system and out of state purchases/trades.
- Utilize the current statewide regulations, 1 fish over 40 inches may be harvested.
- Educate anglers that this species is used for Utah chub suppression and also as a trophy angling opportunity.

Goal 3: Enhance the diversity of angling opportunities by adding alternative fish species

Objective 1: Stock sterile walleye and hybrid striped bass (wipers).

Strategies

- Manage this species according to the criteria described in Goal 1, Objective 3.
- Utilize sterile walleye and wipers as a harvestable species and as an apex predator on Utah chub.
- Manage angling expectations based on the timeline of management (i.e., early stages of Utah chub control may produce trophy opportunity, then after that they may simply be utilized to control Utah chub as a background predator).
- Develop and install an escapement prevention structure.

Objective 2: Stock tiger muskellunge.

Strategies

- Manage this species according to the criteria described in Goal 2, Objective 3.
- Develop and install an escapement and prevention structure.

Objective 3: Continue to stock rainbow trout, tiger trout and cutthroat trout.

Strategies

- Manage rainbow trout according to the criteria described in Goal 1, Objectives 1 and 2.
- Manage tiger trout and cutthroat trout according to the criteria described in Goal 2, Objective 1.

Goal 4: Reduce Utah chub numbers with a sustainable management model

Objective 1: Continue the stocking and use of Bear Lake Bonneville cutthroat trout and tiger trout.

Strategies

- Retain the current regulations for these two species. All cutthroat and tiger trout between 15 and 22 inches must be immediately released, no more than two cutthroat or tiger trout under 15 inches may be kept, and no more than 1 over 22 inches may be harvested.
- Maintain an average, combined gillnet catch rate 10- 15 cutthroat and tiger trout/net night with 50% of the catch exceeding 12 inches.
- Educate anglers that this regulation is necessary to suppress Utah chub numbers and must remain in place moving into the future.
- Stocking rates defined in Goal 2, Objective 1.

Objective 2: Stock sterile walleye and hybrid striped bass (wipers).

Strategies

- Stock conservative numbers of both species based on availability within UDWR's hatchery system and out of state purchases.
- Stocking rates defined in Goal 1, Objective 3.
- Manage according to statewide angling regulations described in Goal 1, Objective 3.
- Adjust stocking rates in response to Utah chub abundance and availability as a prey source.
- Educate anglers that these species are a tool to control Utah chub and numbers stocked will likely be reduced as Utah chub numbers decrease.

Objective 3: Stock tiger muskellunge.

Strategies

- Utilize the current statewide regulations, 1 fish over 40 inches may be harvested.
- Educate anglers that this species is used for Utah chub suppression and also as a trophy angling opportunity. Number of fish stocked will likely be reduced as Utah chub numbers decrease.
- Stocking rates defined in Goal 2, Objective 3.

Objective 4: Utah chub monitoring.

Strategies

- Continue spring and fall gillnetting at Scofield Reservoir utilizing American Fisheries Society standardized nets and the small mesh add-on panel.
- Reduce current population size and maintain average gill net catch rates ≤ 55 Utah chub/net-night within five years.
- Educate the public that the goal is to suppress and control and that complete eradication is not possible or desired.
- Maintain adaptability regarding predator stocking (i.e., cutthroat trout, tiger trout, sterile walleye, wiper, and tiger muskellunge) paying close attention to overall chub abundance.

- Educate anglers and achieve public buy-in regarding the use of new species as a management tool to control Utah chub, and that numbers stocked could fluctuate greatly based on need.
- Prepare for a future rotenone treatment if planned management does not reach the desired outcome (i.e., initiate NEPA process, plan for rotenone purchases, acquire adequate funding, etc.).

Goal 5: Increase angling and recreational use at the reservoir

Objective 1: Increase angling effort by 50% over the next five years.

Strategies

- Publicize the new opportunities and species diversity at Scofield Reservoir focusing on family fishing and trophy fishing opportunities.
- Conduct short duration creel surveys every two years to assess changes in angling use.
- Conduct follow up online surveys to assess changes in angler satisfaction and perception at Scofield Reservoir and adapt management as necessary.

Objective 2: Increase State Park visitation by 50% over the next five years.

Strategies

- Increase outreach efforts to educate and encourage visitors.
- When a new species is stocked into the reservoir let the public know about the new opportunity and hold fishing clinics to build excitement.
- Communicate angler success more frequently to show current conditions.
- Provide new/updated information to hand out as visitors arrive at the Park.
- Increase advertising (television, radio, internet, etc.).

Objective 3: Reestablish Blue Ribbon Fishery Designation.

Strategies

- Communicate regularly with the Blue Ribbon Fisheries Council and provide updates on the status of the management plan implementation.
- Determine if issues outside the scope of the management plan need to be addressed to meet Blue Ribbon Fishery criteria.
- Recommend Scofield Reservoir for Blue Ribbon Fisheries status by 2023. Criteria for re-designation includes re-establishing the family fishery, increasing species diversity, and increasing angling and State Park use.

Goal 6: Manage Scofield Reservoir for compatibility with native species management as its outflow connects to the Price, Green, and Colorado Rivers

Objective 1: Minimize negative impacts on native species.

Strategies

- Work with the USFWS, Upper Colorado River Recovery Team, conservation teams, UCRB State Wildlife Agencies, and UDWR native aquatics staff to gain approval of the Scofield Reservoir Fishery Management Plan.
- Only consider the use of fish species on the compatible list (USFWS 2015) when introducing new species.
- Assess the viable options to prevent downstream escapement.
- Create a stakeholder contact list to share information regarding management changes, introductions of new species, as outlined in the UCRB stocking protocol (2009).

Discussion

The Scofield Reservoir Fishery Management Plan will serve as a guide for achieving the goals and objectives created by the Advisory Committee. There are many factors that the Advisory Committee and the UDWR cannot control. Periods of low water and high nutrient levels can cause summer/winter fish kills, create conditions for toxic algal blooms, or make introductions of new species difficult. An adaptive management strategy will be necessary in order to respond to adverse conditions caused by nature or anthropogenic factors. Objectives and strategies and their associated timelines may need to be altered to match unpredicted challenges. Stocking rates of all fish species may need to be altered to match current environmental and biological conditions. The UDWR will continue to work with the Advisory Committee as needed to manage the fishery.

Working in concurrence with this management plan a future rotenone treatment will be planned. The NEPA process will be initiated and all environmental clearances will be obtained. Long term financial needs will be identified for the future purchase of rotenone, and the need to mobilize a significant amount of manpower will be considered in the UDWR's work planning process over the next several years. If the current management plan does not produce the desired results laid out by the Advisory Committee, planning for a potential rotenone treatment will already be well underway.

This plan will be submitted to all appropriate stakeholders including the USBR, USFWS, conservation teams, UCRB State Wildlife Agencies, local irrigation companies, the Upper Colorado River Recovery Team, the Southeastern Regional Advisory Council, and the Utah Wildlife Board.

Plan Lifespan and Timeline

The Scofield Reservoir Fishery Management Plan will have a lifespan of five years from the date of approval. Utah chub gill net catch rates must meet or be approaching their management objective within that time span since they are the critical, limiting factor to the success of this plan. Many Goals and Objectives of this plan are also dependent on the introduction of new species. If these introductions are not successful, modifying the management plan may be necessary before the plan expires (e.g., a rotenone project may be implemented). After a period no longer than five years (earlier if necessary) this plan will be re-evaluated by the Advisory Committee. Goals and Objectives will be evaluated for success and modifications will be made to meet current conditions.

The Rotenone Option

When the Advisory Committee first met, they identified the need to reduce and control the Utah chub population, and unanimously agreed it was the most limiting factor in developing a quality fishery at Scofield Reservoir. The Committee identified two methods for reducing Utah chub biomass: biological control and a rotenone treatment. After a lengthy and careful discussion, a majority decision was reached to initiate a fisheries management strategy utilizing the biological controls laid out in this plan. As described in the previous section, a rotenone treatment is being planned and will be initiated if the Goals and Objectives of this plan are not reached.

Works Cited

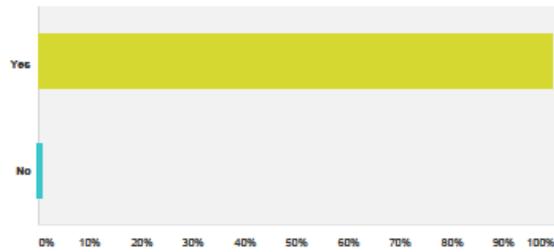
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Appendix I. Results from public online survey (.pdf file, open in Adobe acrobat)

2016 Scofield Reservoir Angler Survey Results

Q1 Would you be willing to participate in this survey?

Answered: 2,628 Skipped: 6



Answer Choices	Responses
Yes	98.28% 2,505
No	0.71% 18
Total	2,628

Appendix II. Catch Rates (#/net-night) of Fish Caught in Gillnets from 2006 to 2016 and Desired Catch Rates as Defined in Management Goals.

Year	Rainbow trout	Cutthroat trout	Tiger trout	Utah chub
2006	20.0	4.7	5.0	2.7
2007	32.0	1.5	8.5	26.5
2008	20.7	4.0	24.3	230.3
2009	9.7	10.7	13.0	357.3
2010	5.6	21.2	6.2	48.0
2011	3.0	7.0	5.8	132.8
2012	2.4	8.0	8.2	134.4
2013	1.4	14.2	8.6	157.2
2014	1.6	18.0	3.2	84.6
2015	0.8	10.8	2.2	193.4
2016	0.0	8.8	1.4	135.4
Desired catch rate	15-20	*10-15	*10-15	≤ 55

*Combined catch rate for cutthroat trout and tiger trout

APPENDIX III. Lists of Nonnative Aquatic and Riparian Species that are Considered Compatible or Non-Compatible with Endangered Fish Recovery in the Upper Colorado River Basin (Revised May 2015)

Table C-1. Lists of nonnative aquatic species’ compatibility with the recovery and preservation of endangered and native aquatic species within critical habitat of the upper Colorado River basin (UCRB). Judicious management of compatible species must conform to Stocking Procedures signed by the upper basin States of Utah, Colorado, and Wyoming, and the U.S. Fish and Wildlife Service in 2009 (USFWS 2009). These stocking procedures prohibit stocking any nonnative species directly into riverine critical habitat and require that non-salmonid species be managed in isolated or screened ponds or reservoirs to prevent or control their escapement into critical habitat. Non-compatible species should not be further introduced or stocked into any waters in the UCRB. All nonnative species not listed here are initially classified as non-compatible but may be considered on a case by case basis.

Compatible List	Non-Compatible List
Fish	
<p>Salmonids, including, but not limited to:</p> <p>Brown trout <i>Salmo trutta</i></p> <p>Lake trout <i>Salvelinus namaycush</i></p> <p>Arctic char <i>Salvelinus alpinus</i></p> <p>Brook trout <i>Salvelinus fontinalis</i></p> <p>Rainbow trout <i>Oncorhynchus mykiss</i></p> <p>Cutthroat trout <i>Oncorhynchus clarkii</i></p> <p>Kokanee <i>Oncorhynchus nerka</i></p> <p>& Arctic grayling <i>Thymallus arcticus</i></p> <p>Bluegill <i>Lepomis macrochirus</i></p> <p>Black crappie <i>Pomoxis nigromaculatus</i></p> <p>Largemouth bass <i>Micropterus salmoides</i></p> <p>Yellow perch <i>Perca flavescens</i></p> <p>Triploid grass carp <i>Ctenopharyngodon idella</i></p> <p>Fathead minnow <i>Pimephales promelas</i></p> <p>Tiger muskie* <i>Esox lucius</i> x <i>E. masquinongy</i></p> <p>Wiper* <i>Morone saxatilis</i> x <i>M. chrysops</i> (Hybrid Striped bass)</p> <p>Sterile Walleye* <i>Sander vitreus</i> (100% triploidy)</p> <p>* In order to be considered compatible, the stocking of sterile predators requires appropriate escapement prevention, such as outlet screens or spillway nets</p>	<p>Smallmouth bass^ <i>Micropterus dolomieu</i></p> <p>Northern pike <i>Esox lucius</i></p> <p>Walleye <i>Sander vitreus</i></p> <p>White sucker <i>Catostomus commersoni</i></p> <p>Red shiner <i>Cyprinella lutrensis</i></p> <p>Burbot <i>Lota lota</i></p> <p>Catfish species, including, but not limited to:</p> <p>Channel catfish^ <i>Ictalurus punctatus</i></p> <p>Blue catfish <i>Ictalurus furcatus</i></p> <p>Flathead catfish <i>Pylodictis olivaris</i></p> <p>Black bullhead <i>Ameiurus melas</i></p> <p>Yellow bullhead <i>Ameiurus natalis</i></p> <p>^ May be stocked in waters above Flaming Gorge Dam</p>

Compatible List	Non-Compatible List
Crustaceans	
	All crayfish species Anchor Worm <i>Lernea cyprinacea</i>
Molluscs	
	Quagga and Zebra mussel <i>Drissena</i> spp. New Zealand mud snail <i>Potamopyrgus antipodarum</i>
Cestodes	
	Asian tapeworm <i>Bothriocephalus acheilognathi</i>
Plants	
	Tamarisk <i>Tamarix</i> spp. Russian olive <i>Elaeagnus angustifolia</i> Didymo <i>Didymosphenia geminata</i> Eurasian watermilfoil <i>Myriophyllum spicatum</i>