Milwaukee River Estuary Walleye Management Plan

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Lake Michigan Fisheries Team
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Milwaukee River Estuary Walleye Management Plan

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OVERVIEW

Introduction

This Milwaukee River Estuary Walleye Management Plan (Plan) will guide the management of the walleye fishery in the Milwaukee River and Estuary. It was developed through a process designed to engage fisheries and law enforcement personnel working on Lake Michigan, the interested public and external partners.

The Plan presents a comprehensive work agenda. We have listed tactics that will measure the success of this walleye Plan and classified them as ongoing management activities, ongoing projects, funded projects, and future projects. We realize that we may not achieve all of the proposed objectives or employ all of the future tactics as they may be limited by budgets and priorities established outside the Fisheries Management Program. However, the majority of the tactics presented in this plan are ongoing or funded projects set to begin in the next year or two. The order of presentation of objectives and problems is not intended to reflect agency priorities.

As a framework for the Department's authority and guidance to manage fisheries in Wisconsin waters of Lake Michigan and its tributaries it is key to point out that we remain committed to *A Joint Strategic Plan for Management of Great Lakes Fisheries* (SGLFMP) (Great Lakes Fishery Commission 1997). This basin-wide management agreement was developed with assistance from the Great Lakes Fishery Commission. Wisconsin is a signatory to SGLFMP along with the seven other Great Lakes states, the Chippewa-Ottawa Treaty Fishery Management Authority[1], the Great Lakes Indian Fish and Wildlife Commission, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, the Ontario Ministry of Natural Resources, and the Canada Department of Fisheries and Oceans. As a signatory, Wisconsin has agreed to a set of procedures for coordinating activities and resolving conflicts. Through SGLFMP, the Department accepts the following common goal for Great Lakes fishery agencies:

> *To secure fish communities, based on foundations of stable self-sustaining stocks supplemented by judicious plantings of hatchery-reared fish, and provide from these communities an optimum contribution of fish, fishing opportunities and associated benefits to meet needs identified by society for wholesome food, recreation, employment and income, and a healthy human environment.*

Pursuant to the Joint Strategic Plan, the Department works with the Michigan DNR, the Indiana DNR, the Illinois DNR, and the Chippewa-Ottawa Resource Authority to address issues of common concern on Lake Michigan. Lakewide fisheries management policies are developed by those five agencies through the Lake Michigan Committee (LMC). The LMC has adopted a set of Fish Community Objectives (Eshenroder, et al. 1995) to guide all five agencies in the management of Lake Michigan fisheries. The inshore fish objective is to maintain self-sustaining stocks of yellow perch, walleye, smallmouth bass, pike, catfish and panfish. Expected annual yields should be 0.9 to 1.8 million kg (2 to 4 million lb) for yellow perch and 0.1 to 0.2 million kg (0.2 to 0.4 million lb) for walleye. Self-sustaining walleye stocks has become more of a possibility because of increased egg production, improved balance in fish communities and continuing improvements in water quality and habitat. Creation of this objective has lead Great Lakes states to develop walleye restoration plans in various

[1] COTFMA has been re-constituted as CORA, the Chippewa-Ottawa Resource Authority, which is expected to become a signatory to the Joint Strategic Plan.

areas in the Great Lakes. Rehabilitation of self-sustaining walleye populations in Green Bay (Schneeberger 2000), Saginaw Bay (Fielder 2002, Fielder and Baker 2004) and Lake Superior (Hoff 2003) are long-standing management goals of the Michigan Department of Natural Resources. In addition, Minnesota DNR and the Ontario Ministry of Natural Resources (Hoff 2003) have goals to maintain, enhance and rehabilitate habitat for walleye and to establish self-sustaining populations in areas where walleyes historically lived. These plans are very similar to this Plan in that they have objectives or goals for habitat improvement, restoration of native species via a stocking program and assessments to determine the progress of the restoration efforts. Therefore, this Plan builds on the framework from the Great Lakes Fishery Commission, Fish-Community objectives for Lake Michigan (Eshenroder, et al. 1995). The Plan is consistent with and supports the objectives contained in the ecosystem based Milwaukee River Estuary Remedial Action Plan (WDNR, 1993) and the Integrated Resource Management Plan for the Milwaukee River South and Menomonee River Watersheds (WDNR, 1990 and 1991).

Background and technical issues

Background

In an effort to improve the near-shore fishery in the Lower Milwaukee River, fry and fingerlings of native species including walleye, northern pike and smallmouth bass were stocked since the mid 1980s. Fry stocking yielded only marginal results. In the mid 1990s, when the yellow perch population in Lake Michigan declined dramatically, the interest in improving populations of alternate near-shore species grew much stronger in the local fishing community. With the initial financial support from the Lakeridge and Lakeshore sportfishing clubs, the Department in 1995 embarked on a pilot project of raising and stocking 10,000 extended growth walleye fingerlings (6” to 8” in length) annually in the lower Milwaukee River. A detailed walleye restoration plan for the lower Milwaukee River and harbor was developed (WDNR 1998). The main objective of the program was to re-establish a self-sustaining walleye population. No natural reproduction of walleye has been documented to date primarily because of variable stocking rates resulting in low adult population density over the course of the 7-year plan (Hirethota and Burzynski 2004). In addition to this walleye restoration plan, the Department completed a habitat project in coordination with the removal of the North Ave. Dam. In-stream habitat, bank cover and bank stabilization improved the fisheries habitat in this area. Now that the initial 7-year plan is complete, this Plan has been created to guide future walleye restoration efforts in the Milwaukee River Estuary.

Technical issues

The walleye has been an important game fish across the United States and as illustrated above has been integrated into various rehabilitation plans in the Great Lakes. Concerns about environmental impacts of these re-introductions, especially as it relates to predation impacts on other species, have been evaluated in most areas where stocking has occurred. Of special interest to this plan is the impact of walleye and other species on stocked salmon and trout. Many fish species have been found to prey on stocked salmon and trout including walleye (Swor and Bulow 1975, Rieman et al. 1991, Poe et al. 1994, Baldwin et al. 2003, DePhilip et al. 2005), northern pike (McMahon and Bennett 1996, Devine et al. 2005), brown trout (Alexander 1977), northern squawfish (Peterson et al. 1990, Tabor et al. 1993, Poe et al. 1994, Shively et al. 1996 and smallmouth bass (Swor et al. 1975, Rieman et al. 1991, Poe et al. 1994,

Tabor et al. 1993). In many of these studies, predators on salmon and trout opportunistically feed on stocked fish when they are abundant.

Some of these studies were conducted in the Columbia River basin of the Pacific northwest or Lake Erie, which because of the size of the waterbody (Columbia River – 65 million ha, Lake Erie – 2.6 million ha, Milwaukee River Estuary – 526 ha), location (Pacific northwest, non-Lake Michigan drainage), water temperatures, and predatory population level are not germane to this plan. However, the Michigan and Wisconsin Departments of Natural Resources conducted several studies to investigate food web dynamics in large bays of the Great Lakes. These specific cases are discussed below in relation to this Plan.

Johnson and Rakoczy (2004) investigated the decline of brown trout in Thunder Bay, Lake Huron. Thunder Bay is located in the northeast part of Michigan's Lower Peninsula. It measures 22,000 ha and has a maximum depth of 27 m. Gill nets were used to collect piscine predators of brown trout and diets of these predators were assessed. The most abundant species in the gill net samples were alewives, brown trout, walleye and channel catfish. Stocked brown trout comprised 23.5% by number in adult brown trout stomachs and 8.2% by number in walleye stomachs for fish species consumed. From 1990 – 2001, 694 walleyes were sampled but only 20 had at least one brown trout in their stomachs.

Johnson and Rakoczy stated that it was unclear what piscivorous species were most important in causing the decline. They noted that walleyes feed on brown trout smolts but walleye numbers, if anything, declined during the study. However, the double-crested cormorant population rose from 452 to 3,766 nesting pairs between 1989 and 1997, an 8.4 fold increase. Results from this study suggest that a combination of fish predation on stocked trout, rising avian predation and the sharp decline in alewives, which had been a staple for piscivorous species, may explain the post-1995 decline in brown trout stocking success in Thunder Bay.

The results from Thunder Bay may not apply to the Milwaukee River Estuary for two reasons. First, Thunder Bay is 41 times larger than the Milwaukee River Estuary (22,000 ha compared to 526 ha). The Milwaukee River Estuary cannot sustain the large numbers of walleye observed in Thunder Bay so the risk to stocked salmon and trout is limited. Second, the brown trout failure in Thunder Bay after 1995 appeared to be caused by sharply declining alewife abundance (Johnson and Rakoczy 2004), a circumstance we have not seen in Lake Michigan. In fact, Lake Huron has extremely low alewife numbers (Schaeffer et al. 2005) and many salmon and trout may be migrating to Lake Michigan for forage (David Clapp, Michigan DNR, personal communication). While Lake Michigan has experienced lower alewife levels in recent years (Madenjian et al. 2005), alewife are still supporting a robust fishery. In fact, chinook salmon harvests by Wisconsin anglers the past three years has been 954,064 fish, the highest three year total since stocking of salmon and trout began in the 1960s.

Schneeberger (2000) investigated the population dynamics of yellow perch and walleye stocks in Michigan waters of Green Bay, Lake Michigan from 1988 – 1996. Like Thunder Bay, Green Bay is a large area covering 277,537 ha. The habitat is highly variable and supports a diverse fish community. Fish were captured using trawls, gill nets and seines and fish stomach contents were identified and counted. Walleye ranked 8th in overall abundance for all assessment methods combined. Fish were found in 51% of 369 walleye stomachs with rainbow smelt, alewife and yellow perch comprising 81% of the stomach contents in Little Bay de Noc. In Big Bay de Noc, of 47 walleye stomachs examined, 54% contained fish including alewife, rainbow smelt and johnny darter. Schneeberger did not find large numbers of salmon and trout in walleye stomachs even though smolts that had been stocked in the waters of Green Bay. Results from this study suggest that Green Bay can and does support a large

walleye population which is orders of magnitude greater than found in the Milwaukee River Estuary. Even at high walleye population levels, predation by walleye on stocked salmon and trout was found to be very low in this study.

Devine et al. (2005) sampled predators in Chequamegon Bay, Lake Superior so that they could model prey consumption by coolwater and coldwater predators to quantify the effect of predators on the fish community. Chequamegon Bay, like the previous examples, is a large bay (16,660 ha) that has an average depth of 8.6 m. The bay has a very diverse habitat and supports a wide range of species including shiners, percids, suckers and salmonines. Walleye fed predominantly on rainbow smelt at all ages throughout the spring and summer and switched to yellow perch, coregonines, salmonines and other fish species in the autumn and winter. Walleye were found to consume the most prey, approximately 4,688 tons per year and were the primary predator of salmonines in Chequamegon Bay accounting for 90% of the total salmonine consumption. Most of the consumption was on stocked splake. Predatory overlap between walleye and stocked fish in Chequamegon Bay undoubtedly contributes to this consumption. In addition, like the other study areas, Chequamegon Bay is a huge body of water that can support millions of fish. The walleye population is estimated to be over 3,700,000 fish, 7,400 times higher than the current population estimate for the Milwaukee River Estuary.

Two features of these three study areas contrast with the Milwaukee River Estuary. All three systems are large bays 31 to 527 times larger than the Milwaukee River Estuary and capable of supporting many more predatory fish. Secondly, salmonid stocking locations in the three study areas were in large open bays where they were vulnerable to all predators. In contrast, most of the salmon and trout stocking in the Milwaukee River Estuary has been and will continue to be at the lower end of the estuary at times when walleye are most likely to be found farther up stream. Data collected by Hirethota and Burzynski (2004) indicate a strong walleye seasonal movement pattern coinciding with changing water temperatures and spawning activity. In winter the majority of the walleyes were found in the warmer water associated with a power plant discharge located on the Menomonee River and the adjoining Burnham and South Menomonee Canals. This preference is likely due to the more favorable conditions and the presence of large numbers of gizzard shad found in this vicinity. In spring, the walleyes tended to move upstream on the Milwaukee River, with fish found below the former North Avenue Dam and further upstream. Shocking surveys confirmed the presence of fish of comparable size in spawning condition in the upstream reaches of the dam, so it has been inferred that the radio-tagged fish were engaged in a spawning migration. This upstream movement places the walleyes farther away from the current chinook salmon stocking site, located in McKinley Marina, and serves to lessen the potential for predation by walleyes on chinook smolts. This movement also places the walleyes upstream of the stocking locations for the other species of trout and salmon. Summer found the walleyes in the Milwaukee Outer Harbor and lower Milwaukee River, presumably due to preference for cooler water temperatures.

It is worth noting that despite some potential problems, Wisconsin and Michigan DNR in Lakes Superior, Michigan and Huron remain committed to walleye restoration and rehabilitation. It makes good ecological sense to have a stable native predator population established in the estuary to feed on any exotic prey species that are present (goby, three-spine stickleback, white perch, etc) or that may show up in the future (ruffe). Gizzard shad, while native to Wisconsin's Mississippi River drainage area, may have been accidentally introduced into Lake Michigan (Becker, 1983).

Our creel survey results do not indicate that walleye stocking to date has hurt the salmon and trout fishery. Wisconsin's creel results for the Milwaukee River Estuary for salmon and trout harvest rates

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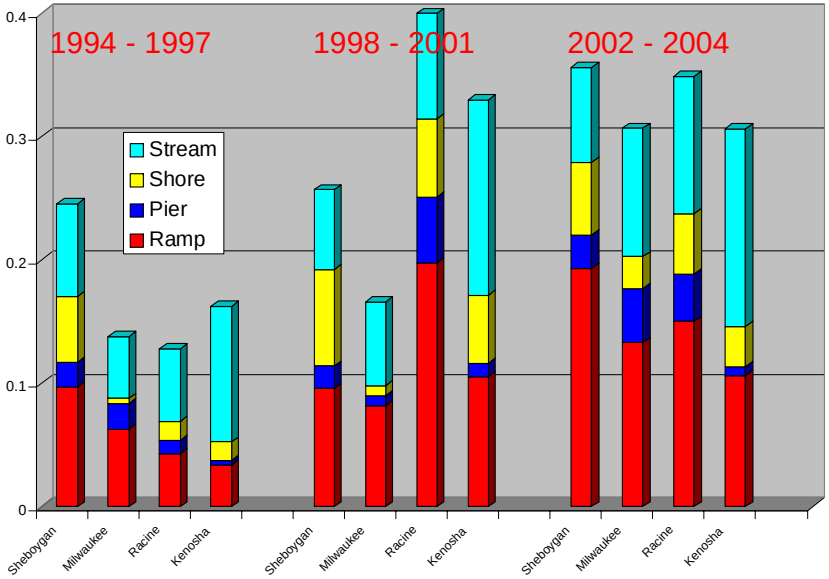

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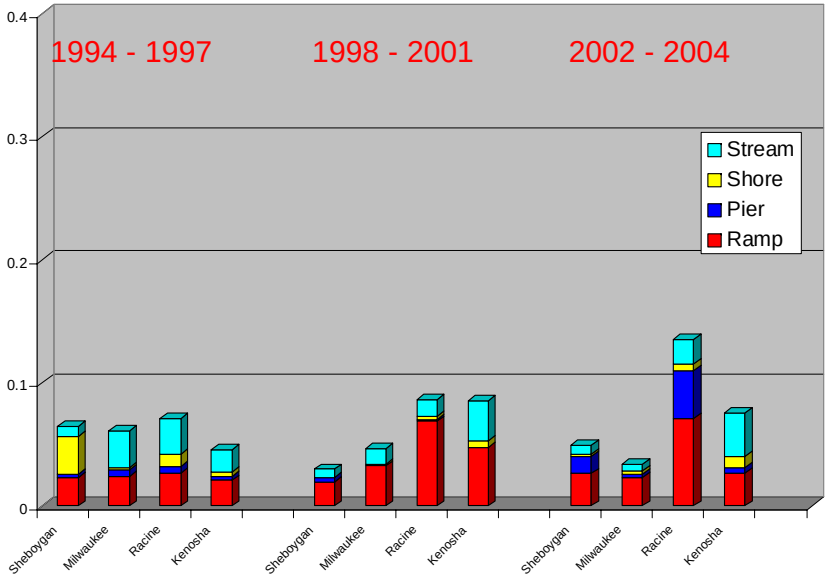

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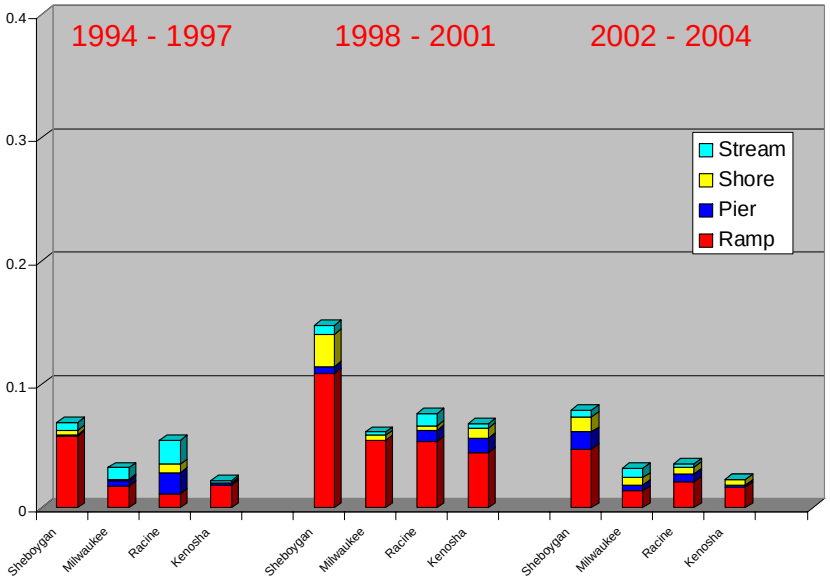

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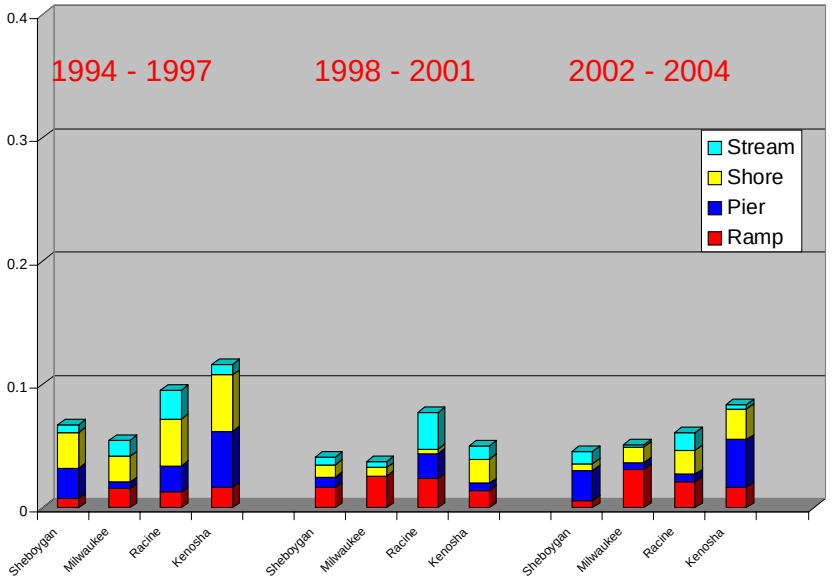


Figure 1 a - d. Harvest rate (fish/hour) by county, species and fishery type for three time periods. 1994 – 1997 = period prior to walleye stocking in the Milwaukee River Estuary, 1998 – 2001 = period during the first two experimental walleye stockings and 2002 – 2004 = period during the most recent walleye stockings. Harvest rate was calculated from August to October so that the majority of fish harvested would be mature fish homing back to specific ports.

have remained similar over three time periods including pre-walleye stocking, walleye stocking and recent years and are similar to other areas in southern Lake Michigan (Figure 1a-d). Specifically, a) chinook salmon harvest rates are about 0.3 at all ports from 2002-2004, b) coho salmon harvest rates in Milwaukee are similar to Sheboygan, c) rainbow trout harvest rates have always been low at Milwaukee, and d) brown trout harvest rates have remained at about 0.05 fish per hour for all three-time periods indicating that early mortality has remained constant over time and that adequate forage is available throughout their life history. Additionally, fishing for brown trout has been excellent during the winter months when our creel survey is not conducted. While each county has a unique fishery associated with their location on Lake Michigan and to a certain extent the numbers of salmon and trout that get stocked in each area, comparing the harvest rate in Milwaukee to these areas does not show any discernable trend. In conclusion, these data suggest that in the Milwaukee River Estuary, careful fisheries management can produce both a walleye and salmon and trout fishery.

While definitive proof that walleyes are directly responsible for the declines of salmon and trout elsewhere was not shown, the DNR will take proactive measures to insure the long-term viability of the salmon and trout program in the Milwaukee River Estuary. We will adopt three strategies to minimize the impact of walleye on stocking salmonines. First, we will stock salmon and trout at the largest size possible. Stocking of larger and older fish increases survival after stocking whether it is for walleye (Laarman and Schneider 1986), brown trout (Weber 1988), or rainbow trout (Yule et al. 2000). Currently, the Department attempts to stock rainbow and brown trout and coho salmon at the largest possible size to maximize survival. Recent low water conditions in Wisconsin coupled with decreased budgets have forced us to earlier stocking times but the latest stocking dates are reserved for the Milwaukee River Estuary for these species. Several tactics, Objective D, Problem 2, tactic a – e and Objective D, Problem 3, tactic c address these points. Second, we will use pens where possible. The use of "net pens" (Johnson and Clevenger 2004) has been shown to increase survival of chinook salmon in Lake Huron. Currently, we are using net pens for chinook salmon and have used them for coho salmon. Previous studies (Hirethota and Burzynski 2004) have shown that short-term (1 to 3 weeks post stocking) predation on chinook salmon by walleye was reduced to zero following chinook salmon stocking location change and the use of net pens (Table 1). In addition, the chinook salmon harvest before and after the influence of walleye in the Milwaukee River Estuary has been very similar and in recent years the harvest of chinook has been excellent (Figure 2). This plan outlines a continuing tactic to use this technology to maximize survival of these fish (Objective D, Problem 3, tactic d). Third, we will use Great Lakes strain walleye. Walleye spawning behavior has been suggested to be a heritable characteristic. Jennings et al. (1996) found that offspring of broodstock from river-spawning populations were captured more frequently in upstream habitats. As part of this plan, we are committed to stocking Great Lakes strain walleyes that utilize upstream areas for spawning. These stocked walleyes based on radio telemetry data (Hirethota and Burzynski 2004) have been shown to migrate upstream for spawning at the same times stocked salmon and trout have been stocked in the lower reaches of the Milwaukee River and harbor thereby limiting their interactions and any potential predatory impacts.

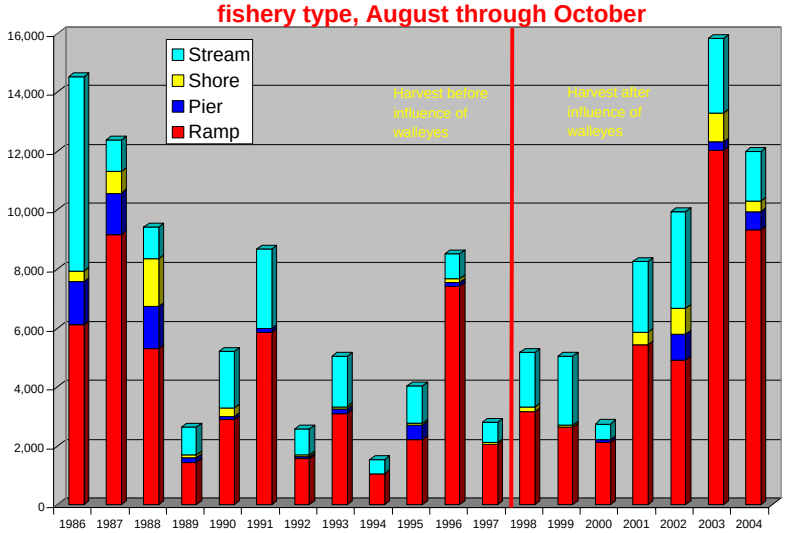
Table 1. Stocking location and predatory impact on chinook salmon stocked in the Milwaukee River Estuary.

Year	# of chinook stocked	Stocking location	Number of chinook salmon estimated to have been eaten by walleye
1996	144,250	Below North Ave. Dam	1,123 [1]
1997	181,000	Below North Ave. Dam	30,162 [1]
1998	145,000	McKinley Marina	Zero
1999	144,000	McKinley Marina	Zero

2000	143,900	McKinley Marina	Zero
2001	151,000	McKinley Marina	Zero
2002	122,300	McKinley Marina	Zero
2003	145,000	McKinley Marina	Zero
2004	144,000	McKinley Marina	Zero

[1] Estimates represent worst case scenario and are based on several unlikely assumptions: 1) all surviving walleyes were in the area of chinook salmon stocking and 2) the walleyes remain in the area the entire time that the chinook salmon smolts are present. Actual numbers are probably less than the estimates.

Figure 2. Chinook salmon harvest from Milwaukee County by year and fishery type, August through October



Finally, we believe that the risk to stocked salmonines is mitigated by the presence of abundant alternative prey in the Milwaukee River system. Walleye are an opportunistic predator and will forage on available prey including gizzard shad and alewife (Wagner 1972, Knight et al. 1984, Knight and Vondracek 1993, Fielder et al. 2000), rainbow smelt (Wagner 1972, Haas and Schaefer 1992), shiners (Knight et al. 1984), bluegills (Kolar et al. 2003) and a variety of trout and salmon (Swor and Bulow 1975, Rieman et al. 1991, Poe et al. 1994, Baldwin et al. 2003, DePhilip et al. 2005). Past (Holey 1984) and current studies (Hirethota et al. 2005) have shown that the Milwaukee River Estuary contains a diverse population of prey species for predators including spottail shiner, gobies, gizzard shad, alewife, variety of panfish and others. The presence of these prey species will help to buffer any predation impact on stocked salmon and trout. Creel results (Figure 1) show that harvest rates for salmon and trout have remained similar over the three time periods indicating that these diverse populations of forage fish are providing a food source for native and stocked fish and are limiting any impact on salmon and trout.

Habitat objectives in this plan will further help these prey species maintain and possibly build their population levels in the area. In addition, dam removal, habitat access and creation and water quality improvements have expanded the capacity of the system to support walleyes and other species. The Plan outlines tactics to protect, maintain and enhance the habitat in the Milwaukee River Estuary (Objective A, Problem 1 – 3, all tactics)

In summary, based on available information from past and current studies and tactics outlined in this plan, Department concludes that the rehabilitation of walleye in the Milwaukee River is feasible and can be done with minimal impacts to the existing fisheries. We acknowledge that walleyes have the potential to impact certain species but information from these studies, changes in our management in the

salmon and trout stocking location, method and time and continuing assessments should insure the viability of not only the walleye but also the salmon and trout fishery. However, if during the duration of this Plan, the adult walleye population greatly exceeds the 2 adults/acre goal, or we observe a negative effect on the salmonid creel estimates that is related to a higher predator biomass of walleyes in the Milwaukee River Estuary, we will re-evaluate the Plan and have more discussions with the stakeholders.

Summary of ongoing and planned projects

Throughout the initial 7-year walleye plan (WDNR 1998), the Department conducted assessments on both walleye and salmonid populations. These assessments included spring walleye population, walleye spawning and young-of-the-year surveys. In addition, the department assessed the short-term impact of predators on recently stocked chinook salmon and worked with the local fishing clubs to raise walleyes (Walleyes for Tomorrow) and stock chinook salmon in net pens (Milwaukee Chapter – Great Lake Sport Fishermen). The Department recognizes that there are uncertainties with any management action, which is why we conducted the assessments and surveys listed above. Throughout the process of writing this new Plan, we have incorporated comments and suggestions into our assessment protocols. These new surveys will increase the amount of information available to assess the progress of walleye restoration in the Milwaukee River Estuary and the effect on the salmonid populations. The projects listed above will continue during this Plan and will be augmented by the following projects: 1) An evening/night creel survey is planned for FY06 and FY07 to gather better information on walleye fishing in the Milwaukee River Estuary; 2) young-of-the-year walleye survey will be enhanced and a fall fingerling walleye survey will be added to the walleye assessment protocol to determine if natural reproduction has occurred; 3) the short-term impact of predators on recently stocked fish will be expanded to include fall fingerling brown and coho salmon and yearling rainbow and brown trout and coho salmon; and 4) salmonid stocking dates, time and locations will be investigated to insure that maximum survival occurs. We believe that by closely monitoring the fisheries we can insure the viability of not only the walleye but also the salmon and trout fishery.

Project funding

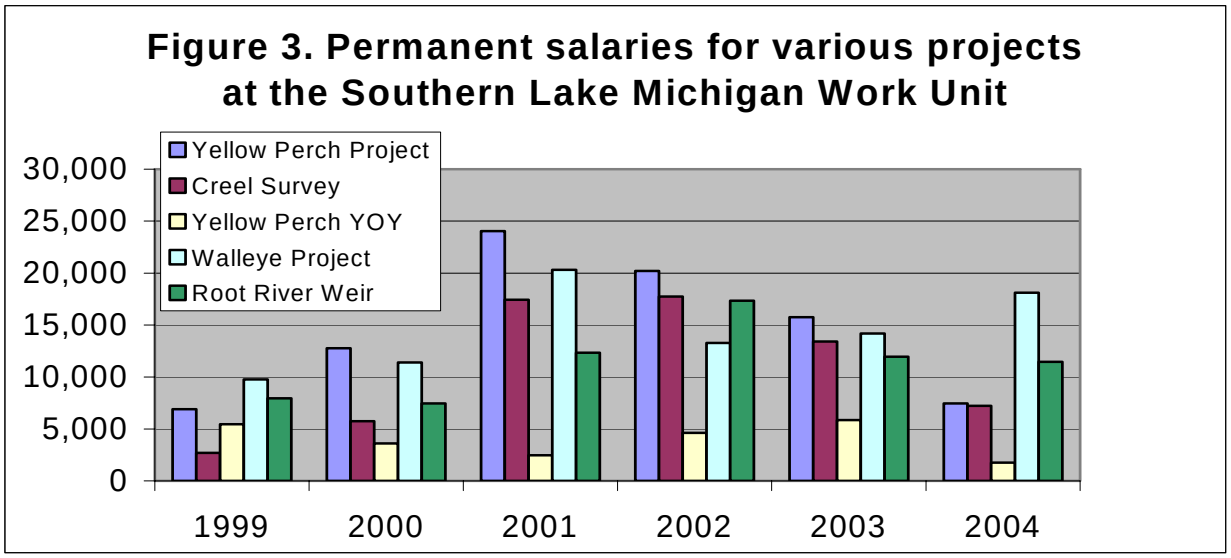
Financial support for this project has come from multiple sources. Walleyes used in the rehabilitation effort are raised using money from Wisconsin DNR general fish and wildlife account segregated funds (FW-SEG) and from gifts from private fishing clubs. DNR FW-SEG funds pay for the infrastructure costs like salaries, heat, lights, and water for the hatcheries, while private clubs pay for most of the food. Anglers who purchase a regular fishing license are helping pay for this rehabilitation effort, and no Great Lakes Trout and Salmon Stamp segregated funds (SS-SEG) have been used to raise or stock walleye. Table 2 shows the source, purpose and amount used for this walleye project. The Department's annual funding for projects in this table outlines money spent for Limited Term Employees and supply costs. In addition to this funding, permanent staff time for the Southern Lake Michigan Work unit is shown in Figure 3 for various projects including yellow perch assessment (FHCG), creel survey (FHCR), yellow perch young-of-the-year surveys (FHHL), walleye restoration project (FHJX) and Root River Steelhead Facility (FHSE). In general the amount of money spent on permanent salaries for the walleye project is similar to other projects conducted by the work unit. The higher costs in 2004 reflect the time needed to complete the data for the walleye open house and draft of the walleye management plan.

Table 2. Funding for walleye restoration plan by source. WDNR annual funding came from approved projects funded with DNR FW-SEG funds.

Date	Source	Purpose	Amount

1995	Lakeshore Fisherman Sports Club	Initial funding to raise 10,000 extended growth walleye fingerlings	$10,000
1996	Lakeshore Fisherman Sports Club and Lakeridge Boat Club (joint offer)	Continuation of the project	$2,500
1997-98	WDNR annual funding	Approved project costs	$2,812.50
1998-99	WDNR annual funding	Approved project costs	$2,812.50
1998	Walleyes for Tomorrow	Paid private hatchery to raise extended growth walleye fingerlings	Private fund
1999-00	WDNR annual funding	Approved project to cover the cost of evaluation, radio telemetry, and marking evaluation	$15,650
2000-01	WDNR annual funding	Approved project to cover the cost of evaluation, radio telemetry, and marking evaluation	$15,650
2000	Walleyes for Tomorrow	Cost of raising extended growth walleye fingerlings	$5,000
2000	Walleyes Unlimited	Purchase of new radio tracking equipment	$2,800
2001	Lakeridge Boat Club	Purchase of equipment for fish age determination	$4,000
2001	Walleyes for Tomorrow	Cost of raising extended growth walleye fingerlings	$5,000
2001-02	WDNR annual funding	Approved project to cover the cost of evaluation, radio telemetry, and marking evaluation	$8,347
2002	Walleyes for Tomorrow	Cost of raising extended growth walleye fingerlings	$5,000
2002-03	WDNR annual funding	Approved project to cover the cost of evaluation, radio telemetry, and marking evaluation	$9,867
2003	Walleyes for Tomorrow	Cost of raising extended growth walleye fingerlings	$5,000
2004	Walleyes for Tomorrow	Cost of raising extended growth walleye fingerlings	$7,500

Future funding will also come from a variety of sources including donations from private fishing clubs and approved projects in the DNR from general fish and wildlife segregated funds. Projects approved for FY06 and FY07 include a walleye creel survey, predation survey and walleye assessment surveys funded from DNR FW-SEG funds. In addition, other local, state, federal and private sources have and will continue to be important sources of funds for enhancing and restoring fish and wildlife communities, and recreational opportunities throughout the Milwaukee River Basin, Estuary and Lake Michigan ecosystems. For example, the $4.5 million Milwaukee River Restoration and North Avenue Dam Removal Project improved sediment and water quality, fish and wildlife habitat and recreational uses along the lower Milwaukee River and Estuary and was made possible through grants provided by a variety of public agency and private groups (WDNR, 1997).



Summary of walleye effort and harvest

The Wisconsin DNR conducts an annual creel survey of anglers on Lake Michigan and Green Bay to generate an estimate of angler effort and harvest for all major game species. The survey covers just the daylight hours. Some of the walleye harvest occurs at night when the survey is not running. This indicates that because of the survey design and fishing habits of anglers targeting walleye the estimates generated are likely minimum estimates. A funded project for FY06 and FY07 has been created to specifically target anglers where and when they are fishing walleyes using an evening/night creel design.

We estimate that a total of 1,443 walleyes have been harvested since 1996 in the Milwaukee Estuary by anglers. The majority of the harvest has been concentrated in 2002 and 2003 when 401 and 469 walleyes were harvested indicating a growing interest in the walleye fishery from anglers. In addition, there appears to be a fair amount of targeted fishing effort for walleye in the Milwaukee River Estuary (Table 3). Prior to stocking (1995), directed effort for walleye was low, and almost exclusively by shore anglers. Since 1995, the directed effort by all fishery types has increased. Public interest in the walleye fishery has increased, as indicated by the increase in targeted effort (2003 to present) to over 1,000 hours for shore anglers, 600 hours for anglers upstream of the dam and 800 hours for anglers fishing in the Menomonee River and canals. Overall angler response is positive and nearshore anglers have had opportunities to fish for these native fish.

Table 3. Total directed angling effort (hours) for walleye from March 15 through October 31, 1990 to 2004 in the lower Milwaukee River, Menomonee River canals and the harbor.

Creel survey year	Fishery type					
	Ramp	Pier	Shore	**Stream**		
				Downstream of the Dam	Upstream of the Dam	Menomonee River /canals
1990	0	0	696	0	0	NA
1991	0	0	167	0	0	NA
1992	0	0	13	0	0	NA
1993	0	0	13	0	0	NA
1994	0	122	23	0	116	NA
1995	0	0	0	0	0	NA
1996	0	0	148	0	0	NA
1997	0	18	734	1606	221	NA
1998	871	0	3,551	0	0	NA
1999	0	34	360	0	0	NA
2000	0	0	242	0	222	NA
2001	0	0	67	0	0	109
2002	0	328	632	285	175	2,652
2003	133	614	1,751	79	665	4,271
2004	262	0	1,048	144	2,645	883

PLAN OUTLINE

This plan is presented in outline format, moving from broad objectives to specific tactics. Within each objective a statement is presented and then one or more problems are identified, and for each problem, one or more tactics are suggested. Each tactic is classified according to one or more of the following categories: 1) ongoing – this is work that we are currently doing but not necessarily as part of a project, 2) ongoing project in FY06 and FY07 – this is work that we are currently doing as part of an approved project, 3) funded project in FY06 and FY07 – this is work that we will conduct as part of an approved project and 4) projected project in FYXX – this is work that we hope to conduct in future fiscal years. The tactics are too numerous to summarize here, but the following paragraphs capture the main features of the Plan. Much of this plan is taken directly from the Lake Michigan Integrated Fisheries Management Plan 2003 – 2013. To view this plan and other management documents please visit our website at **http://dnr.wi.gov/org/water/fhp/fish/lakemich/** and click on Management Reports. In addition, much of this new plan is a direct extension of previous work and studies conducted on walleyes. An executive summary of the previous work can be read in Appendix A or read the full report titled "An Evaluation of Walleye Population Restoration Efforts in the Lower Milwaukee River and Harbor, Wisconsin, 1995-2003", (PUB-FH-510-2004) on our website.

Protect, maintain, and enhance habitat for game and non-game fish species. Habitat for both native and introduced, game and non-game species is a high priority for the Department. Restoration and/or creation of habitat that will ensure the long-term sustainability of fish populations in the lower Milwaukee River, its tributaries and the Milwaukee River Estuary is key to any rehabilitation plan. Tactics to address this habitat objective included habitat restoration and creation, non-point source pollution efforts, dam removal and restoration or enhancement of enclosed or concrete lined tributaries.

Protect and restore native species. Because of habitat degradation and loss, native fish species that once flourished in the Milwaukee River Estuary have been extirpated or reduced to very low numbers. Stocking efforts to re-introduce these species remains a cornerstone for fisheries management when faced with these problems. Continued stocking of walleye for the next five years at levels comparable to the previous plan will help us achieve our restoration goal of naturally reproducing walleye in the estuary.

Maintain and develop fisheries assessments. In order to determine the population of walleye, young-of-the-year numbers and the spawning population, fisheries assessments must be ongoing and new assessments developed where warranted. Tactics to achieve this objective are conducting a night time creel survey to better estimate the walleye harvest in the area combined with specific assessments on the walleye populations.

Maintain and enhance salmon and trout populations in Lake Michigan. The Department remains committed to judiciously stocking salmon and trout in tributaries and harbors of Lake Michigan and Green Bay including the Milwaukee River Estuary. Accurate harvest numbers of fish caught in the lake and tributaries is important along with insuring that adequate numbers of salmon and trout are stocked. Managing both cool and cold water species stockings is crucial to the success of both programs. These tactics include surveying habitat, assessing impacts of enhanced populations on other species, continuing to stock limited numbers of walleyes in the Milwaukee River and continuing to work with private groups to supplement rearing costs, deploy net pens, and meet other project needs.

Objective A. Protect, maintain, and enhance habitat for game and non-game fish species.

Although manipulation of fish populations is possible by a variety of techniques (e.g. fish stocking, regulation of harvest), ultimately an abundant, diverse, and stable fish community depends on the availability of suitable habitat for the desired species. By the broadest definition, suitable habitat includes those physical, chemical, and biological factors that are needed to satisfy the essential requirements of a species, allowing it to survive in an aquatic environment.

Human activity has altered fish habitats by filling or dredging wetlands and littoral areas, constructing solid piers, diverting and increasing runoff, decreasing base flow and changing drainage patterns in watersheds, releasing contaminants into the air and water, increasing nutrient loading, and releasing chemical pollutants. We must seek to protect undisturbed habitat, maintain functioning habitat, and, if possible, improve or create habitat beneficial to both game and non-game species.

Problem 1. Walleye spawning habitats are degraded or destroyed.

Urbanization and industrialization of the lower reaches of many major Lake Michigan tributaries have resulted in extensive filling of wetlands. Also, fills behind established bulkhead reduce shallow water and riparian habitat. Mitigating these losses with rock rip-rap appears to be one method of increasing walleye natural reproduction.

Tactic a) Evaluate the feasibility of enhancing walleye spawning habitat in the Menomonee and Milwaukee Rivers and the use of spawning shoals in the Milwaukee River and spawning marshes in the Trinity Creek watershed, and other areas as appropriate. (Funded project in FY06 and FY07)

Tactic b) Investigate the feasibility of concrete channel removal in the lower Menomonee River. (Projected project for FY10)

Problem 2. Land use practices can lead to non-point source pollution affecting fish in our tributaries and estuaries.

While most people are familiar with the dramatic effects of point source pollution (e.g., direct discharge of untreated waste water into a stream or lake and resultant fish mortality), non-point source pollution has been largely overlooked in the past because it is not as conspicuous in its sources and effects. Non-point source pollution is the result of land use changes and inadequate urban and agricultural stormwater management practices. Improper land use management practices can result in increased sediment, nutrient, organic-chemical and heavy-metal loadings to streams, while creating abnormal flow rates. All have negative effects on aquatic communities by destroying habitat, increasing turbidity, lowering dissolved oxygen levels, disrupting food webs, decreasing diversity, raising stream temperatures, altering stream flow, and increasing the abundance of undesirable species.

Tactic a) Provide information to external agencies and to the Department's Runoff Management Program to support programs that protect water quality and provide a diversity of habitats for fish. (Ongoing)

Tactic b) Encourage use of buffer strips by educating riparian landowners about programs like CRP and CREP. (Ongoing)

Tactic c) Support Department Law Enforcement and environmental regulatory staff in enforcement actions for violation of laws relating to water pollution, storm water runoff and water and shoreline protection. (Ongoing)

Tactic d) Encourage highway departments to take steps to reduce sediment runoff resulting from roadside ditch maintenance. (Ongoing)

Problem 3. Dams and other waterway alterations limit the movement of fish in rivers and can degrade habitat.

Most major Lake Michigan tributaries have been dammed. These dams restrict both upstream and downstream movement of fish and wildlife. The dams can benefit fisheries by preventing sea lamprey from reaching suitable spawning habitat and limiting upstream migrations of other detrimental species, but they can have major negative effects. They can restrict access of many native species to large areas of spawning and nursery habitat and divide populations into genetically isolated sub-populations. The native species affected can include smallmouth bass, walleye, musky, northern pike, and lake sturgeon. Blockage of the upstream migration for anadromous fish also limits stream fishing opportunities. The Department through the Bureau of Fisheries Management and Habitat Protection regulates alterations of waterways for other purposes. In addition, contaminated sediments in the impoundment of most dams is a major concern and must be addressed before alterations to these dams can be accomplished.

Tactic a) Encourage the removal of obsolete and other selected dams and identify methods for passing migratory species around dams. Insure that contaminated sediment issues are addressed as part of these projects (Projected project for FY08)

Tactic b) Continue to advise Water Management Specialists and local zoning agencies about fishery impacts from waterway alterations. (Ongoing)

Tactic c) Restore or enhance in-stream and riparian habitat after dam removal. (Funded project in FY06 and FY07)

Objective B. Protect and restore native species

Human activities in the Lake Michigan basin, through water quality degradation, habitat modification, intentional and unintentional introduction of non-indigenous species, and sport and commercial fishing, have had profound effects on native fish populations. The Lake Michigan system as a whole has been sufficiently altered that it is not feasible to completely restore the pre-settlement native fish community. However, rehabilitation of populations of some native species could promote diversity and stability within the ecosystem, while also, in some cases, providing additional sport or commercial opportunities.

Problem 1. Natural walleye recruitment does not sustain an acceptable fishery in the Milwaukee River and Harbor.

In an effort to improve the near-shore fishery in the Lower Milwaukee River, fry and fingerlings of native species including walleye, northern pike and smallmouth bass were stocked since the mid 1980s. Fry stocking yielded only marginal results. In the

mid 1990s, when the yellow perch population in Lake Michigan declined dramatically, the interest in improving populations of alternate near-shore species grew much stronger in the local fishing community. With the initial financial support from the Lakeridge and Lakeshore sportfishing clubs, the Department in 1995 embarked on a pilot project of raising and stocking 10,000 extended growth walleye fingerlings (6" to 8" in length) annually in the lower Milwaukee River. A detailed walleye restoration plan for the lower Milwaukee River and harbor was developed (WDNR 1998). The main objective of the program was to re-establish self-sustaining populations. The plan also included marking each fish in order to identify the year of stocking and evaluate the performance of each year class. In addition, a radio telemetry study was incorporated to examine movement patterns of adult walleye. The growth rate of the stocked walleye has been well above average compared to other walleye populations in the state. Anglers are now targeting walleye, with good seasonal catches documented. Catch-and-release has played a big part of the success of the program. No natural reproduction of walleye has been documented to date primarily because of variable stocking rates resulting in low adult population density over the course of the 7-year plan (Hirethota and Burzynski 2004).

Tactic a) Stock 10,000 extended growth Great Lakes strain walleye or 30,000 fingerlings annually from 2005 – 2009. (Funded project in FY06 and FY07)

Tactic b) Establish a minimum of 2 adult walleye per acre in the Milwaukee River Estuary. (Ongoing)

Tactic c) Use extended growth walleye fingerlings, when available, for stocking in the Milwaukee River. (Ongoing)

Tactic d) Continue to mark each year-class with a specific finclip. (Funded project in FY06 and FY07)

Objective C. Maintain and develop current fisheries assessments

Fisheries assessments are one of the best tools for fisheries management to understand the populations of fish in a given area. These tools range from young-of-the-year assessments using trawls and seines to adult and spawning populations using fyke nets and electrofishing equipment. To accurately manage a fishery, these assessment tools must be used and modified as circumstances dictate.

Problem 1. The majority of walleye harvest can occur in the evening hours, hours not covered by the existing creel survey.

The Lake Michigan Creel survey conducted by the Department is one of the most comprehensive surveys in the United States. This survey runs from mid March to October and covers fishing from Kenosha to Marinette, Wisconsin. However, due to cost constraints the survey is limited to daytime hours. Inland creel surveys that are tailored for walleye harvest are usually conducted in the evening when most walleyes are caught. A similar effort is needed in the Milwaukee River Estuary to more accurately estimate the walleye harvest. In addition, the current creel survey was created, tailored and modified to target the salmon and trout harvest and not coolwater species like walleye.

Tactic a) Investigate if the current creel survey can be modified to include some evening, nighttime or winter fishing hours funded with DNR general FW-SEG funds. (Projected project for FY08)

Tactic b) Initiate an evening/night creel survey, if possible, with DNR general FW-SEG funds. (Funded project in FY06 and FY07)

Problem 2. More information on walleye life history patterns are needed.

Walleye life history information in the Milwaukee River Estuary is limited but expanding each year as assessments are conducted on a variety of life stages. These assessments form the backbone for the management of walleye in this system. Efforts to maintain and even expand these assessments are warranted so that critical information needed to maintain the balance between native and introduced species is maintained.

Tactic a) Continue spring walleye population assessment. (Ongoing project in FY06 and FY07)

Tactic b) Continue walleye spawning assessment. (Ongoing project in FY06 and FY07)

Tactic c) Continue young-of-the-year larvae survey. (Ongoing project in FY06 and FY07)

Tactic d) Conduct fall fingerling survey. (Ongoing project in FY06 and FY07)

Objective D. Maintain and enhance salmon and trout populations in Lake Michigan

Sport fishing in Wisconsin's waters of Lake Michigan has been great the past four years and especially outstanding for chinook salmon. Management activities including chinook salmon stocking reductions, improved hatchery practices, declining incidence of bacterial kidney disease, have led to the high estimated harvest of chinook salmon detected since 2002. Target levels of harvest have been established in the Lake Michigan Integrated Fisheries Management Plan 2003 – 2013 and are listed below for the six salmon and trout species currently stocked in Lake Michigan.

We will continue to sustain this fishery through a stocking program similar to that employed in recent years. The distribution of stocked salmon and trout other than lake trout along the Wisconsin shoreline has been determined primarily in consideration of catch data, previous stocking patterns, and the distribution of fishery access facilities (i.e., ramps, moorings, piers, shoreline, and streams)(Krueger and Dehring 1986).

Estimated annual sport harvest of salmon and trout from Wisconsin waters of Lake Michigan during 1992 through 2004 and target ranges for the next five years.

	1992– 2004 harvest average	target range	
		Low	high
brook trout & splake	1,383	1,000	5,000
brown trout	39,323	25,000	65,000
rainbow trout	82,775	70,000	120,000
chinook salmon	180,260	85,000	190,000
coho salmon	80,365	50,000	140,000
lake trout	46,360	30,000	82,000

Problem 1. Accurate sport harvest estimates are needed.

Our knowledge of sport harvests is based on creel surveys funded largely from the sale of Great Lakes Salmon and Trout Stamps and on reports submitted by charter captains. Creel surveys provide needed information about numbers of fish harvested, movements of marked fish, growth and fitness of harvested fish, extent of natural

reproduction, and angler effort. They can also be used to collect data related to special studies or management questions. Recognizing that states differ in creel survey methods, the Creel Task Group of the Lake Michigan Technical Committee compared creel surveys in the four states and issued recommendations in 1995. The Wisconsin creel survey was considered well designed. All recommendations to improve Wisconsin's survey have been implemented. The Creel Task Group recommended that all states annually provide a standardized set of data to a lakewide creel survey database. Wisconsin has consistently submitted data to the GLFC for this purpose, but no lakewide synthesis has occurred.

Tactic a) Continue conducting sportfishing creel surveys. (Ongoing project in FY06 and FY07)

Tactic b) Expand the creel survey to assess winter and spring brown trout, brook trout and splake harvest and effort. (Projected project for FY10)

Tactic c) Encourage synthesis of lakewide creel results. (Ongoing)

Problem 2. Current salmon and trout stocking quotas are annually adjusted

The current salmon and trout sport fishery in Lake Michigan, and particularly in Wisconsin's waters, is almost entirely dependent on artificial fish propagation and stocking. Since the stocking of salmon and trout was implemented on a large scale, one new hatchery (Kettle Moraine Springs) and two egg-collection facilities (one on the Kewaunee River and one on the Root River) have been added to the Department's Lake Michigan cold-water propagation system. The Department has also acquired the former USFWS hatchery at Lake Mills, which produces both coolwater fish (walleye, northern pike, smallmouth bass) for inland stocking and, currently, coho salmon for Lake Michigan. The remainder of the substantial increase in the number and pounds of trout and salmon required to meet Lake Michigan stocking quotas has been produced by the existing facilities to the point of overcrowding their rearing capacity, with a subsequent reduction in the quality of the fish produced. These problems have been compounded by increased space needs for the inland feral (wild) trout program, the evaluation of two new strains of rainbow trout for Lake Michigan and reductions in rearing capacity due to facility maintenance needs. Closures of two of the Department's hatcheries (Hayward and Crystal Springs) in the early 1980s and a third in 2005 (Westfield) because of funding shortfalls have added to the strain of the propagation system.

Tactic a) Help clarify and document the need for improved facilities. (Ongoing)

Tactic b) Identify a facility for near-shore captive broodstock. (Ongoing)

Tactic c) Continue to insure that the Great Lakes Trout and Salmon Stamp and Two-day Sports Fishing License prices are set appropriately to help pay for Great Lakes hatchery renovations. (Ongoing)

Tactic d) Work with the Wild Rose State Fish Hatchery Renovation project to insure fisheries management objectives are incorporated into the renovation. (Ongoing)

Problem 3. Fish species desired by anglers in Lake Michigan and its tributaries may be limited by habitat and may conflict with other management objectives.

In the lower reaches of some tributary streams the amount of available habitat has increased because of improvements in water quality and the removal of dams. With the removal of the North Avenue Dam in Milwaukee smallmouth bass have thrived and northern pike are also doing well. Additionally, in the Milwaukee River a number

of mature walleye can be found. However, the lower reaches of most Lake Michigan tributaries provide limited habitat for these species, so only small increases in harvest opportunities can be expected.

Moreover, the Department is concerned about the impact of smallmouth bass, walleye, and northern pike on salmon and trout. Currently, many of Wisconsin's Lake Michigan tributary streams are seasonally managed for those anadromous cold-water species. Those rivers not only are host to returning adult fish, but also are the sites of stocking of thousands of fingerlings and yearlings. To mitigate this problem in the Milwaukee River, the Department has worked with the Milwaukee Great Lake Sport Fishermen to deploy net rearing pens outside the mouth of the river, where young chinook salmon can be held prior to release.

Tactic a) Survey and describe existing habitat and describe what each location can support. (Ongoing project in FY06 and FY07)

Tactic b) Assess the short-term impact of enhanced populations on salmon and trout on a biennial basis by conducting predatory surveys after salmon and trout stockings. (Ongoing project in FY06 and FY07)

Tactic c) Adjust stocking locations and time of stocking when needed. (Ongoing)

Tactic d) Continue to work with private groups to supplement rearing costs, deploy net pens, and meet other project needs. (Ongoing and ongoing project FY06 and FY07)

Tactic e) Work with the University of Wisconsin-Milwaukee and the WATER Institute in initiating a food web assessment of the Milwaukee River Estuary. (Projected project for FY10)

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APPENDIX A
Executive Summary from
An Evaluation of Walleye Population Restoration Efforts in the Lower Milwaukee River and Harbor, Wisconsin, 1995-2003. PUB-FH-510-2004

With the removal of the North Avenue Dam on the lower Milwaukee River in 1990 several miles of upstream waters were made available to migratory as well as resident species whose movements were restricted until then by the Dam. In addition, the Department implemented some major habitat improvement activities in the formerly impounded area in 1997. Surveys indicated many new fish species recolonizing the area as the water quality and habitat progressively improved. This project was aimed at attempting to reintroduce walleye (*Sander vitreus*), one of the native species in the Milwaukee River system, which became nearly extirpated due to damming and poor habitat conditions. Additionally, it was envisioned as an alternate source of nearshore fishing due to a declining yellow perch population.

Approximately 10,000 extended growth Great Lakes strain walleye fingerlings were stocked annually since 1995 in the Lower Milwaukee River downstream of the former North Avenue Dam. The fish were individually marked to identify their year-class either by a single finclip or by using a Visible Implant Elastomer (VIE) mark. Predation impact, if any, caused by walleye on stocked salmonid smolts was monitored each year soon after releasing the salmon smolts by capturing and analyzing stomach content of the predators. Considerably higher predation impact was noticed in 1996 and 1997 during the first ten days post-stocking. Based on this information, the stocking location for Chinook salmon (*Oncorhynchus tshawytscha*) smolts was relocated to McKinley Marina, several miles away from the location of walleye stocking. This change eliminated the loss of Chinook salmon smolts due to predation immediately following stocking. A net pen was also used to acclimate the salmon smolts to the lake water by holding them over night in the marina water.

A comparison of growth and survival rates between the walleye marked with two different marking techniques (finclip vs. VIE) did not show any significant differences. A cost benefit analysis indicated no obvious benefits using elastomer marking. VIE marks were detectable in walleye as old as 5 years, however, the retention rate appeared to decrease with age.

In general, growth rates of these walleye were greater than statewide average growth rate for walleye populations (average growth rate of 100mm per year in the first three years in the Milwaukee harbor). Mature and spent walleye were recorded during spring spawning assessments beginning in 1998. However, we have not yet documented successful natural reproduction in the system. Population size estimated based on all age groups of walleye varied from year to year, the most recent estimate in 2003 ranged from 401 to 2388.

Radiotelemetry technology was used to track movement by surgically implanting a radiotransmitter into the body cavity of walleye. The data indicated a distinct seasonal movement pattern by the adult walleye according to water temperature and food availability. During the summer they moved from the rivers to cooler and deeper harbor waters. In winter they moved to the warmer waters in the Menomonee River canals which receive warm water discharges from a nearby power plant. There is a significant angling effort targeted towards walleye in recent years along the Menomonee River canals, Summerfest lagoon and in the Milwaukee River upstream of the former North Avenue Dam to Kletzsch Park. Most of the anglers practice catch-and-release.

APPENDIX B
Review of comments
DRAFT - Milwaukee River Estuary Walleye Management Plan

In November 2004 a Public Draft of the Milwaukee River Estuary Walleye Management Plan was presented at an open house. It was also mailed to individuals and posted on our DNR Lake Michigan WEB page. Comments on this draft plan were accepted through January 31, 2005. The Southern Lake Michigan Fisheries Team reviewed the comments that we received. Some resulted in changes to the Plan, others were not accepted. The following summary re-states all comments that we received, followed in each case by a response.

1. **We, the undersigned, being Wisconsin Residents or persons holding a valid Wisconsin Fishing licenses, do hereby petition the Wisconsin Department of Natural Resources to continue the walleye restoration program after 2004 as part of the Milwaukee River improvement project (1,327 names).**
   The Department received this petition along with over 1,327 names and addresses asking us to continue the Milwaukee River Walleye Restoration Project.
2. **The WDNR has haphazardly stocked almost 12 million walleye of questionable genetics into the waters of Lake Michigan, the Milwaukee River and Estuary.**
   Prior to 1998, various strains of walleye were used in the attempt to restore walleyes into the Milwaukee River estuary. Since 1986, a total of 9,792,407 walleyes (9,720,000 fry, 7,700 fingerlings, 59,157 extended growth walleyes, 5,000 yearlings and 550 age 2) have been stocked, not 12,000,000. Most of these first plantings were fry (9,720,000) that had extremely low survival rates. Since 1998, careful steps have been taken so that the proper strain of walleye is stocked into these waters. Walleyes from Puckaway Lake were determined to be genetically similar to the Winnebago and Great Lakes strain of walleye. The 1998 plan has been strictly followed in terms of the genetic composition of the stocked walleyes, stocking location of both walleyes and chinook salmon, and predatory impact surveys. This plan was created with the full involvement of the public and has not been conducted in a haphazard manner.
3. **Stocking of walleyes has occurred over the past 17 years without first performing appropriate environmental impact review as required by law.**
   Chapter NR 150, Wis. Adm. Code, sets out the Department's environmental analysis and review procedures. The walleye restoration plans fall specifically under s. NR 150.03(5)(a)15. and (6)(a)5.b., Wis. Adm. Code, "reintroduction of game species into habitats formerly containing the species" and "plans that would not essentially pre–determine future individual department actions or significantly affect the physical or biological environment". Such activities are Type IV actions under the rules. Type IV actions do not require the preparation of an environmental assessment or an environmental impact statement.
4. **WDNR has not followed through on its own proposals (**4 comments**).**
   Prior to the first walleye plan in 1998, initial proposals called for more predation sampling. A revised protocol was developed due to cost and time constraints that concentrated our efforts on sampling after chinook salmon stocking. Since the creation of the first walleye plan in 1998, biennium projects have been written to study both the walleye population and its effects on stocked salmon. These projects went into effect July 1, 1999. Walleye spawning, population estimates, seasonal movement pattern and young-of-the-year surveys in addition to walleye predation surveys on stocked salmon and trout have been conducted annually. Work activities and performance measures in these projects have all been conducted and accomplished.
5. **The goal of establishing a naturally reproducing walleye population is wholly incompatible with the pre-existing trout and salmon program** (2 comments).
   Fisheries Management plans call for the restoration of native species in various waters of the state, usually by re-establishing natural reproduction. Prior to any DNR stocking, walleye were present and probably reproducing at very low levels in the Milwaukee River estuary (Holey 1984). The 1998 plan and this Plan have the goal of restoring a naturally reproducing population in the Milwaukee River estuary. While we now have mature fish in the system, natural reproduction has not yet resumed. The

draft plan calls for 5 more years of stocking to reach the goal of 2 adult walleye per acre. We believe that under the plan, this goal is compatible with the department's trout and salmon stocking program (Appendix A).

6. **WDNR has stated that it would discontinue walleye stocking if depredation upon trout and salmon were serious or surpassed 5%, yet the DNR did not.**

   Early in this project, the fisheries supervisor and water leader of DNR's Southeast Region agreed that if the predation level on salmon and trout in year 1 of stocking walleye (1995) exceeded 5% of the total number stocked, then year 2 of the walleye stocking would not occur. Only 1,123 Chinook salmon were calculated to have been eaten in the first year, or 0.7% of the total stocked. We weren't concerned about the other salmon and trout stocked that spring or the previous fall because they were the same size as the stocked walleyes and therefore not subject to predation. Consequently, year 2 of the walleye stocking was implemented.

   The 5% predation level was exceeded in year 2, however. Based on public input, the 1998 plan was then tailored to address this concern. The 1998 plan ensures that the smallest and most vulnerable salmon and trout that we stock -- the Chinook salmon -- have an increased chance of survival. We do this by altering the stocking time, location and method of stocking. Once walleyes are stocked into the system, they have a variety of food items to choose from including the locally abundant gizzard shad, minnows, stickleback and alewife found throughout the Milwaukee River estuary.

7. **WDNR's conduct and pursuit of walleye stocking in the Milwaukee River Estuary has, from its inception been arbitrary and capricious.**

   For government regulatory action to be arbitrary or capricious, it must be irrational or illogical, and not the result of a deliberative process. Since reasonable minds can differ, the mere fact that you disagree with a DNR action, or even that an action is unpopular, is not sufficient. Decisions that may appear to be inconsistent also are not automatically arbitrary or capricious, because changed circumstances, new information or new priorities may call for a different approach. Furthermore, it is important to understand that in implementing a restoration plan, the department is not acting in a regulatory capacity, but in its resource management capacity. Chapter 23, Stats., gives the department broad flexibility in the way it conducts conservation activities.

8. **The WDNR's conduct in intentionally taking steps to destroy the trout and salmon fishing industry constitutes an unconstitutional regulatory taking.**

   As discussed in the plan, DNR believes there is no credible evidence that actions undertaken as part of this plan will in any way harm the trout and salmon fishery. Further, there simply is no merit to the claim that the restoration plan is an unconstitutional regulatory taking of private property without just compensation. First, fish stocking isn't a regulatory act. Second, nothing has been taken. Third, under Wisconsin statutes and case law, fish belong to the public. Individuals, organizations and businesses have no private property rights in the State's fish. (Commercial fishers who challenged that point in court have repeatedly lost.) If it were otherwise, the department would be unable to regulate fishing unless it first paid you every time it needed to reduce a bag limit, increase a size limit, or shorten an open season.

9. **It is a misuse of segregated fees to feed walleye with fish grown using funds designated for the trout and salmon program.**

   The department has not misspent or misused trout and salmon stamp funds by stocking walleye in the Milwaukee River. Walleyes used in the rehabilitation effort are raised using money from Wisconsin DNR general fish and wildlife account segregated (FW-SEG) funds and from gifts from private fishing clubs. DNR SEG funds pay for the infrastructure costs like salaries, heat, lights, and water for the hatcheries, while private clubs pay for most of the food. Therefore, anglers who purchase a regular fishing license are helping pay for this rehabilitation effort, and no dedicated stamp funds have been used to raise or stock walleye. Furthermore, trout and salmon have never been stocked for the purpose of feeding walleye. On the contrary, we have assessments and surveys to monitor the short-term predatory impact on walleye and have stocked salmonids in net pens to reduce overall mortality. This Plan calls for increased assessments and additional efforts to minimize mortality on stocked salmon and trout. (Objective B, Problem 1, Tactic a and b; Objective C, Problem 2, Tactics a-d; Objective D, Problem 3, Tactics b-d).

10. **The WDNR has stated it would discontinue walleye stocking if natural reproduction were not evident.**

The current management of walleye in the Milwaukee River Estuary really began with the creation of the first walleye plan in 1998. Only 7 years have passed since that plan went into effect, which is a very short time period. Because numbers of stocked walleye have not averaged 10,000 during the past 7 years, we believe another 5 years of stocking is warranted before we reach the conclusion that significant natural reproduction is not feasible in the Milwaukee River Estuary. In addition, this Plan contains tactics to improve the habitat. The Department is currently working on a habitat project with funds approved in FY06 and FY07. Stocking needs to be maintained until this work is completed.

11. **Establishing a naturally reproducing walleye population is incompatible with the pre-existing trout and salmon program.**

    We disagree, please see comment #5.

12. **The trout and salmon program is funded by the fees collected directly from the purchase of Great Lakes Trout and Salmon Stamp.**

    The trout and salmon program is funded from two sources, the Great Lakes Salmon and Trout Stamp and the general fish and wildlife account which includes revenues from the sales of all hunting and fishing licenses.

13. **Funds are being used to continue the walleye stocking that could be put to use in better areas that would be more beneficial to sport fishermen as a whole. (3 comments)**

    We disagree, please see comments #2, #5 and #15.

14. **I would like more studies done on the predation of walleyes on other trout and salmon species, such as coho, browns and rainbows, not just the impact upon the chinook salmon. (4 comments)**

    We agree. In spring 2005, we have conducted predation surveys after 2 brown trout, 2 rainbow trout and 1 chinook salmon stocking events. In addition, this plan has tactics to assess impacts of enhanced populations on other species on a biennial basis and to continue to stock limited numbers of walleyes in the Milwaukee River and assess potential impacts of a walleye stocking program on salmonid species (Objective D, Problem 3, Tactics b and c). This is a funded project for FY06 and FY07.

15. **Walleye restoration in the Milwaukee River Estuary is simply ludicrous. All the reports on stocking walleye have no justification for stocking walleyes.**

    As the agency responsible for management of the State's fish resources and fisheries, it is the department's duty to manage scientifically, and to maintain and develop adequate and stable resources for all uses in the face of increasing demands. One way that the department fulfills that duty is by its continuing commitment to make every effort to insure walleye restoration remains compatible with the stocking of trout and salmon.

16. **What will happen when the system is shocked with unlimited walleye predation?**

    We believe that even with further habitat improvements the walleye population here will always be limited. The Milwaukee River Estuary is a highly degraded system that is on its way to a recovery. However, the ecology of the system will probably limit natural reproduction despite our best efforts. The Department is committed to assessments of both the walleye and salmon and trout in the Milwaukee River Estuary. Several tactics have been incorporated into this plan that will allow us to closely monitor both the walleye and salmon and trout populations (Objective C, Problem 1, Tactics a and b; Objective C, Problem 2, Tactics a – d; Objective D, Problem 1, Tactics a – c; Objective D, Problem 3, Tactics b and c). In addition, the goal of 2 adult fish per acre is only about 2,600 walleyes and we have had trouble reaching this goal in most southern Wisconsin waters.

17. **There is a tremendous trout and salmon fishery in Milwaukee, funded by salmon stamp money, putting it in jeopardy would be very unethical.**

    Salmon stamp revenue is not the only source of funding for the salmon and trout program. Almost half the cost is paid for with revenues from regular fishing licenses. It is regrettable that some salmon were lost to walleye predation. However, the potential for significant walleye predation on stocked Chinook salmon was addressed in the 1998 walleye plan, and the issue of predation on other salmonine species is addressed in this Plan. By adaptively managing the fisheries, DNR has minimized walleye predation, and will continue to do so.

18. **Is there any reproduction of walleyes in the Milwaukee River? (2 comments)**

    Yes, previous studies have found naturally reproduced walleyes in the Milwaukee River. These surveys were conducted in the early 1980s. Natural reproduction has occurred in the past and probably continues today but at very low levels, in part due to the low levels of walleye present in the system.

19. **What is the trout and salmon stamp money being used for? (2 comments)**

    The funds from the Great Lakes Salmon and Trout Stamp are being used at hatcheries to raise trout and salmon and by Fisheries Management for assessment of trout and salmon populations. Detailed accounting of expenditures from stamp sales are reported bi-annually and can be viewed on our Lake Michigan WEB page. http://dnr.wi.gov/org/water/fhp/fish/lakemich/

20. **Unless all the questions are answered we should not put any more time or money into the project. Will dams need to be removed? Will land have to be purchased? Will more shoreline need to be re-habilitation? You don't have a clear plan.**

    We do have a clear and concise plan that focuses on four main objectives: 1) Protect, maintain and enhance habitat for game and non-game species, 2) Protect and restore native species, 3) Maintain and develop fisheries assessments, and 4) Maintain and enhance salmon and trout populations in Lake Michigan. Many of these questions are addressed in the plan, and if money becomes available we will work through the tactics outlined in this plan.

21. **There are many lakes and rivers in the state that would welcome an enhanced walleye program, the Milwaukee River will never – cannot ever – return to native.**

    We agree that many lakes and rivers would welcome a walleye program and the Milwaukee River is one of those rivers. While we now have mature fish in the system, no detectable natural reproduction has yet resumed. The draft plan calls for 5 more years of stocking to reach the goal of 2 adult walleye per acre. We believe that under the plan, this goal is compatible with the department's trout and salmon stocking program.

22. **If an effective planting of salmonids without a large impact by walleyes (predation) can be demonstrated then it could work. Problem is, mixing walleyes and salmonids have never really worked well.**

    Information obtained over the last 7 years of the walleye rehabilitation plan indicate that for now the stocking of walleyes has had limited impact on the stocked salmon and trout but more work is needed. We have outlined in this plan our commitment to continue to assess both the walleye and salmon and trout fisheries. As the agency responsible for management of the State's fish resources and fisheries, it is the Department's duty to manage scientifically, and to maintain and develop adequate and stable resources for all uses in the face of increasing demands. One way that the department fulfills that duty is by its continuing commitment to seek to make walleye restoration compatible with the stocking of trout and salmon.

23. **Walleye are native to the river and we should try to restore them.**

    We agree and have initiated plans to try and rehabilitate walleyes in the Milwaukee River Estuary.

24. **Everyone should have a right to the chance to catch a few fish from shore and how many of the trout and salmon are close to shore? We don't all have big boats to go off shore.**

    The salmon and trout harvest is comprised almost exclusively from the boat fishery. Over 80% of the harvest come from anglers using boats. Our Lake Michigan Integrated Fisheries Management Plan acknowledges that near shore species like rainbow trout and yellow perch need to be part of the fishery. Once a naturally reproducing walleye population becomes established in the Milwaukee River Estuary additional fishing opportunities, especially for small boat and shore anglers will be a welcomed addition.

25. **The economic impact of walleye cannot even come close to what the State of Wisconsin and private fishing clubs have accomplished.**

    The goal of the walleye rehabilitation plan is not based on the economic impact of the fishery on the anglers of Wisconsin, but rather the restoration of a native species back into its native range and the resulting sport fishery.

26. **There are very few walleye fishermen that will benefit by stocking these walleye in comparison to the thousands of salmon fishermen, charter businesses, hotels, restaurants, equipment sales and the countless other impacts the salmon fishery make every year.**

    Walleye are the most sought after game fish in Wisconsin and opportunities to catch them are limited in southeastern Wisconsin. If a walleye fishery can be reestablished, there is no doubt that the number of anglers and their economic impact will increase. As discussed earlier, we have found no relevant evidence that this restoration would come at the expense of any of the existing benefits of the trout and salmon fishery.

27. **I would like to have the walleye study extended for the next four years if funds are available.**

In the current biennium, fiscal years 2006 and 2007, we have the following projects: Lake Michigan Creel Survey, Walleye Creel Survey, Walleye Predation Study and Walleye Assessment Survey. All of these projects will increase our understanding and knowledge on the interaction of fish in the Milwaukee River Estuary. Since our funding is based on a 2-year cycle, funding beyond these 2 years can not be guaranteed.

28. **Will there be enough feed available to support the walleye fishery along with the trout and salmon and perch?**

    Yes, for most of their lives, these fish species inhabit different areas of the lake. In general, walleyes tend to stay nearshore in estuaries, while yellow perch stay in the lake close to shore. Salmon and trout spend very little time in the tributaries compared to the open lake (7% in the tributaries prior to smolting). We expect them to overlap very little in their food source.

29. **These walleyes in the Great Lakes system are killing salmon and trout by using them as forage.**

    Walleyes and other large predators (brown trout, northern pike, smallmouth bass, largemouth bass, etc.) may use small salmon and trout as part of their diet for a short time. However, as demonstrated in the studies cited in this Plan, for the majority of their life, salmon and trout are found in Lake Michigan, away from these nearshore predators. Also, see comment #28.

30. **If you want walleyes, go north to Winnebago, but not Lake Michigan.**

    It is true that Lake Winnebago has an excellent walleye fishery. That does not diminish the goal of restoring a native species in the Milwaukee River Estuary. Opportunities to catch walleyes are limited in southeastern Wisconsin and the large number of walleye anglers who live in that area would welcome an additional fishery closer to where they live.

31. **We really need a near home area to fish walleyes, opportunities to fish walleye in SE Wisconsin are minimal, especially in the city.**

    We agree, if a naturally reproducing population of walleye becomes established in the Milwaukee River Estuary it has the potential to provide a sustained and productive walleye fishery.

32. **There is way too much artificial stocking of trout and salmon in Lake Michigan. Unless there is an immediate need to keep alewife population down, it seems that these fish are being put in the lake to appease the sportsmen and charters, rather than restore the natural fish habitat.**

    One of the main goals of stocking salmon and trout is to keep the alewife population at low levels. The benefit from this stocking is the tremendous fishery that has developed. As described in the Lake Michigan Integrated Fisheries Plan and in this plan, Wisconsin DNR is committed to the salmon and trout program on Lake Michigan.

33. **By restoring the walleye population in the Milwaukee River estuary you might provide an alternative to the declining yellow perch population.**

    Yes, one of the added benefits that could occur with this plan would be to provide a nearshore fishery for walleyes.

34. **What is the management plan for the Milwaukee River Estuary? Return it to the native species?**

    The current plan for the Milwaukee River Estuary is to rehabilitate walleyes in the system. The majority of the time salmon and trout do not live in and around the system but rather in the open lake. However, we are committed to continue stocking of salmon and trout in and around the City of Milwaukee. Also, see comments #28 and #29.

35. **Can we all agree that walleyes eat salmon and trout?**

    Yes, walleyes are part of the predatory impact on small fish but so are northern pike, smallmouth bass, brown trout and other species. We have found salmon and trout in the stomachs of smallmouth bass, brown trout, walleyes and northern pike.

36. **How many fish can the Milwaukee River estuary hold?**

    We do not know, but it may be hard to answer this question without a lot of time, effort and money. We are committed to the continued assessment of both the walleye and salmon and trout as part of this plan. See comment #37.

37. **Have you done an assessment of the food web in the Milwaukee River Estuary?**

    No. An assessment of this magnitude would be very costly and time consuming. The University of Wisconsin - Stevens Point in conjunction with the DNR conducted a study of this type in Chequamegon Bay, Lake Superior. Now that the University of Wisconsin-Milwaukee has established an advanced

degree program at the WATER Institute, we will work with the Institute to try and initiate a food web assessment in the Milwaukee River Estuary. (Objective D, Problem 3, Tactic e).

38. **To maintain and the overall trout and salmon fishery in the Milwaukee River what is the plan for this fishery?**

    The plan for the salmon and trout fishery consists of a) continued stocking, b) continuing assessments on the sport harvest using the Lake Michigan Creel Survey, c) using information from studies conducted as part of this plan to evaluate both the walleye and salmon and trout programs.

39. **Can we pick different stocking locations for the Trout to increase the survival of the fingerlings?**

    Yes. In 2005, we have altered some stocking locations and stocking times for brown and rainbow trout. As we learn more information on the interactions of all the fish species, we will continue to seek to improve the survival of stocked fish through alterations in stocking locations and times (Objective D, Problem 3, Tactics c and d). In addition, we hope to continue our cooperation with local salmon and trout clubs to accomplish this goal.

40. **Can we increase the amount of Trout we stock into the river to keep the returns the same?**

    Salmon and trout stocking numbers are based on a complex formula that allocates fish to specific counties along the Lake Michigan and Green Bay shoreline that is designed to fairly allocate fish among counties and/or maximize the return of stocked fish. Moving fish from one county to another would be problematic but moving fish to different locations within a county can and has been done not only in Milwaukee but other counties as well. In addition, the number of predators present in Lake Michigan must be carefully controlled to insure the viability of the fishery. Any increases in stocking numbers must be analyzed and discussed with the other Lake Michigan states as part of our partnership with the Great Lakes Fishery Commission. As described in this plan, there is no evidence that there have been any changes in the trout or salmon fishery along southeastern Wisconsin, so there is no compelling reason to change the stocking patterns we have been successfully using to date.

41. **Can you stock the trout and salmon when the Alewives and Gizzard Shad are abundant in the river as to decrease the predation impact on the trout and salmon stocking?**

    To a certain extent we can. However, much of our stocking of salmon and trout is dependent on when these fish have to be moved out of our hatcheries. We have asked our hatcheries to delay stocking of yearling fish into the Milwaukee River Estuary to late spring to reduce the time spent in the estuary and to match the spawning runs of alewives and gizzard shad. (Objective D, Problem 3, Tactic c).

42. **It is true that the pelagic prey models are correct and that the prey base in Lake Michigan is dwindling one would assume that there will be less prey fish for predators to consume and that it would effect the amount of stocked trout and salmon eaten by walleyes?**

    Yes, the current estimates of alewives in Lake Michigan have decreased substantially from 2004 to 2005. However, the diets of walleye and trout and salmon do not overlap to a great extent.

43. **Since it is the feeling that salmon stocking is going to be cut state wide next year, can we keep our quota of Chinooks and trout or increase the stocking as the insure the viability of our fish stocked into the Milwaukee river to maintain the fishery we have at present?**

    Please see comment #40.

44. **Is there natural reproduction of walleyes in the Milwaukee River?**

    Please see comment #18.

45. **It can be assumed that walleyes eat salmon and trout is this a good use of hatchery fish and resources for both species?**

    Please see comments #5, #7 through #10.

46. **If it is found that walleyes, salmon and trout cannot co-exist in the Milwaukee River are you going to choose a direction that this fishery is going to take? And explain what direction the management plans are for the Milwaukee River Estuary with trout and salmon and the native species.**

    This plan outlines the tactics necessary for the success of both the walleye and salmon and trout programs. Another decision complete with public involvement and participation would be needed to choose the path for the Milwaukee River Estuary fisheries management program if it is found that these two fisheries cannot co-exist.

47. **Can warm-water fish and cold-water fish coexist in the Milwaukee River Estuary?**

    Yes. Please see comment #28, #29, #33 and #34.

48. Michigan is now writing up a study done by Jim Johnson on the effects of walleyes on brown trout in rivers. Can we wait before a decision is made on the continuing of stocking walleyes in the Milwaukee River Estuary until this report comes out?

We have consulted with the state of Michigan on this situation. Results are now included in the plan document. Michigan DNR biologists believe that the brown trout declines there are caused mostly by a declining alewife population followed by predation by birds and walleyes. Each river and bay on Lake Michigan is unique. While we can learn some things from studies conducted elsewhere, the ability to transfer this information in total to another area is limited. We will continue to seek to learn more about how to minimize predation by walleye on stocked salmonines.

49. Is it reasonable to assume that walleyes and salmon cannot co-exist in the same fishery or are we kidding ourselves as to the compatibility of these two species living in the same estuary?

At this point it is reasonable to assume we can have these fisheries co-exist. Evidence from the first 7 years of the project has yielded no observable effects on the salmon and trout program. Plans to continue the assessment of these fisheries will allow us to determine if adjustments need to be made for either program. Please see comments #28, 29 and #34.

50. If the plan for the Milwaukee River and the DNR to return the rivers to their native state is there room for the salmon and trout fishery?

Wisconsin DNR has no plans to return the Milwaukee River to its native state that would exclude the stocking of salmon and trout into the river (WDNR 2004). We remain committed to the Walleye Restoration Plan and the salmon and trout program. Assessments contained in this plan will help us understand and adjust each of these items to maximize the potential of each program. Please see comment #46.

51. After the reintroductions of the native species can they reproduce in the river with all the pollutants in the river and dwindling habitat?

Walleyes have been found in the Milwaukee River Estuary prior to stocking by Wisconsin DNR personnel indicating that low levels of reproduction have occurred throughout the years. In addition, this plan outlines tactics to restore and improve fish habitat (Objective A, Problem 1, Tactics a and b), improve land use practices (Objective A, Problem 2, Tactics a – d) and remove impediments to fish migration (Objective A, Problem 3, Tactics a – c). In addition, PCB levels in walleye >18" fall into the same category as chinook salmon >32" (WDNR 2004[2]).

52. What is the long-term plan for trout and salmon in Lake Michigan?

The long-term plan for trout and salmon is for Wisconsin to continue to follow our Lake Michigan Integrated Fisheries Management Plan. This plan calls for the continued judicious stocking of salmon and trout and maintaining angler harvest of all species at the levels described in Objective D of the Plan.

53. Have you found any young of the year walleyes and if not why?

No, we have not found any naturally reproduced walleye young-of-the-year (YOY) yet. We have found green, ripe and spent walleyes during our spring surveys. We just started to look for YOY's in 2004 and 2005 because mature fish were not present in large numbers prior to these years.

54. Why have you continued to stock walleyes into the river that after almost 10 years have not reproduced naturally?

Walleyes have been stocked as part of the 1998 plan for the last 7 years, 1998 – 2004. Walleye females take at least 3 to 5 years to mature so we have had mature fish in the system for only 4 years. Secondly, in many years we did not stock the 10,000 extended growth walleyes called for in the 1998 plan. Both of these factors have contributed to the lack of confirmed natural reproduction. In addition, spawning habitat may be limiting in the system and approved projects in FY06 and in the future will address this potential problem.

55. What are the trade offs of managing the whole ecosystem in the Milwaukee River Estuary between warm-water and cold-water species?

We do not see these as mutually exclusive goals. We hope to restore a modest walleye population while also sustaining salmon and trout fisheries. The major reason for stocking is to try and restore walleye in the Milwaukee River estuary because they were native to the system and have shown to be able to reproduce naturally. Once a population is established, walleye will no longer have to be stocked.

56. What are the pros and cons to continuing the stocking of walleyes and trout and salmon into the Milwaukee River Estuary?

The pros and cons of the program are varied and numerous. Here are the main points. The pros for the plan include the restoration of a native species and ultimately providing a naturally sustained fishery for a popular gamefish in an area of the state with few walleye lakes. The cons include the possibility of predation on stocked salmon and trout.

57. Can we have a study done to have wire-coded tags inserted into the Trout to measure their survival rates? And who will pay for this?

The project to assess the survival rates of stocked salmon and trout would be very costly both in time and money. Since the Milwaukee River has no weir to capture fish during their spawning runs, the collection phase of this study would be very costly. In addition, a second site would have to be chosen as the control, most likely the Sheboygan River, which would add additional costs. Money for this type of project could come from a variety of sources including but not limited to general fish and wildlife account segregated funds, Great Lakes Salmon and Trout Stamp money, general purpose revenue, sport fish restoration money, outside granting agencies or private funds. An easier way to measure survival is to compare angler harvest in the creel survey with neighboring ports, which we will continue to do.

58. Can you do a creel study on the river?

A specific walleye evening/night creel survey is one of the tactics outlined in this plan (C, Problem 1, Tactic b). Currently, this is a funded project for FY 06 and FY07.

59. It is believed by many biologists that there is clearly a conflict with trout and salmon and walleyes in rivers, why then are we going forward to stock walleyes in a 40 year old trout and salmon fishery?

The Department of Natural Resources is committed to the restoration of native species throughout the waters of the State. In addition to walleyes, the Department is committed to a long-range plan to rehabilitate lake sturgeon in the Milwaukee and Manitowoc Rivers. Studies conducted to date have shown that a low number of adult walleyes are presently in the system and that the salmon and trout fishery is doing fine. This plan outlines tactics to continue to assess both fisheries and make changes when appropriate. Please see comment #28.

60. Where is the impact study on trout by predation of walleyes in the Milwaukee Estuary?

Now that this plan has been drafted, we have a specific tactic outlined to look at the predation shortly after stocking on species other than chinook salmon (Objective D, Problem 3, Tactic b). Currently, this is a funded project for FY06 and FY07. Please see comment #14.

61. If the worse case scenario in 1997 found 83% of walleyes having chinook smolts in them would it not be reasonable to assume that walleyes eat the Trout we stock into the river? And why has the stocking placement of the trout not been changed in knowing this?

Despite the high number of walleyes found with the chinook smolts in their stomachs in 1997, the spawning runs produced by these year-classes in the Milwaukee River were outstanding. In fact, no effect on harvest of chinook salmon has been found during the years of walleye stocking. Subsequent diet studies found few or no stocked salmon or trout in walleye diets. Please see comment #39.

62. This successful trout and salmon fishery has been around for years why are we messing around with the eco-system in the Milwaukee River Estuary?

The Department of Natural Resources is committed to the restoration of native species throughout the waters of the State. In addition to walleyes, the Department is committed to a long-range plan to rehabilitate lake sturgeon in the Milwaukee and Manitowoc Rivers.

63. What monetary impacts will the continued walleye stocking have on the Milwaukee community and the successful salmon and trout fishery already established here?

This is beyond the scope of this plan but also see comment #25 and #26.

64. What are the monetary impacts if walleyes and trout and salmon cannot co-exist in the same area? Will we lose the salmon and trout fishery and the money they provide to the state and our community?

There is no evidence to support the assumption that the salmon and trout fishery will be lost in the Milwaukee Area. In fact, studies have shown that the fish caught off specific ports during spring, summer and early fall probably come from stockings throughout the lake.

65. How many other predators are in the Milwaukee River Estuary and how prolific are they in the river / harbor area?

Since we do not have population estimates for other predators in the Milwaukee River Estuary we can not answer this question. However, at certain times of the year the predatory numbers can be quite large. Predators include salmon, trout, northern pike, and smallmouth bass, as well as walleyes. The predatory

level increases in late fall through early spring as brown trout move into the harbors. It also increases in the fall during the chinook, coho and steelhead runs and in spring during the steelhead run. It also would increase a year or two after walleye stocking and during northern pike spawning runs in the spring.

66. Can we do a study on the predication impact of northern and bass on trout and salmon in the Milwaukee River Estuary?

A project like this could be done that specifically targets northern pike and bass. However, as part of our predation study during chinook salmon stocking and more recently during brown and rainbow trout stocking, all predators seen during our electrofishing assessments have been captured and their stomach contents analyzed. We have found salmon and trout smolts in the stomachs of a variety of fish species including brown trout, walleye, northern pike and smallmouth, largemouth and rock bass.

67. How far will the walleyes migrate into the lake and will they take over the perch habitat on the reefs? And will they be detrimental to the perch fishing that are *just* on their way back?

It is unknown for sure how far walleyes will migrate into Lake Michigan. We have captured a few during gill net assessments in the open lake. We do not believe the walleyes will venture too far in the lake nor up and down the coastline. Based on these observations they should not have any significant impact on yellow perch. In many lakes in Wisconsin, walleyes and yellow perch coexist in a healthy predator-prey relationship. We expect that to occur in this area of the lake like it does in Green Bay where they have possibly over 100,000 walleye and a growing yellow perch population.

68. How many hours do fishermen spend fishing for walleyes as compared to trout and salmon? Is it worth the risk of jeopardizing the trout and salmon fishery in Milwaukee area?

Since a lot of walleye fishing occurs at night and in late winter and early spring during times when our regular creel survey is not running its hard to compare the two types of fishing. However, we have in this plan the tactic to conduct a evening/nighttime walleye creel survey to help answer this question (Objective C, Problem A, Tactic b). This project is currently funded in FY06 and FY07.

69. What impact will it have on the economy in the Milwaukee area, Marinas, Fishing retailers, Charter fishing, and Hotels?

We do not expect this plan to impact the existing trout and salmon fishery and its related businesses at all, however we expect an improved walleye fishery to increase fishing activity for walleyes and its related businesses. We are unable to make specific economic predictions.

70. How can you continue to stock walleyes in the Milwaukee River with very high levels of PCBs present in the Estabrook dam impoundment?

The presence of polychlorinated biphenyls (PCBs) in fish causes fish consumption advisories to be warranted for many fish from Lake Michigan and its tributaries. Some game fish from the lower Milwaukee River (below Estabrook Falls) and trout and salmon from Lake Michigan have shown improvement in their consumption category in recent years. For example, Chinook salmon are divided between two categories. In 1998, Chinooks up to 30 inches were considered safe at 1 meal per month. In 2004 Chinooks up to 32 inches fell into the same category. Walleye also showed a similar pattern. In 1998 they were considered safe at 1 meal every 2 months. More recently, PCB concentrations in walleye declined, and those less than 18 inches are now safe at 1 meal per month.

	1998		**2004**	
Species	**1 meal/month**	**1 meal/2 months**	**1 meal/month**	**1 meal/2 months**
Brown Trout	Less than 22"	Larger than 22"	No change	
Chinook Salmon	Less than 30"	Larger than 30"	Less than 32"	Larger than 32"
Coho Salmon	All sizes		No change	
Lake Trout	Less than 23"	23 to 27"	No change	
Rainbow Trout	Larger than 17"		Larger than 22"	
Smallmouth Bass		All sizes	All sizes	
Walleye		All sizes	Less than 18"	Larger than 18"

Data from WDNR Publication No. FH-824 1998 and 2004 revisions

The Department is committed to continuing it's efforts on informing the anglers on the benefits and risks of eating fish from Wisconsin waters including fish in the Milwaukee River Estuary and Lake Michigan. For more information please consult WDNR Publication No. FH-824 2004 revision.