

MICRA PADDLEFISH-STURGEON COMMITTEE MEETING

Ballroom A, Holiday Inn Select (Airport)
2240 Democrat Rd, Memphis, TN 38132
January 20-21, 2009

2009 Committee Assignments

- Anyone who gave a report or presentation to provide Scholten with a summary before February 1, 2009
- Discuss egg check study-conference call or e-mail
- Committee to develop a stocking protocols document before 2009 stockings occur. Scholten will set up conference call for all of those who are interested. At a minimum we will need a representative from each sub-basin and from all agencies that stock paddlefish.
- Scholten to request approval of 2008 minutes by e-mail (**Approved 02-03-09**)
- Next year's meeting will be held on January 20-21, 2010 (Wednesday-Thursday). Tentative location: St. Charles, Missouri
- Elkington to email the tables that he drafted for Commercial Roe Fish Harvest Database to Scholten so they can be reviewed by commercial harvest states. After this review Scholten will work with each state to develop a list of changes that they would have to make so all states could provide standardized data for this database. Dan Burleson to investigate housing options for the database and look into legality issues. If anyone identifies funding or housing options for database, please contact Scholten or Elkington.

DRAFT Meeting Minutes

Tuesday, January 20th - Meeting convened by George Scholten (Chair) at 8:00 AM.

Introductions (see Attachment 1 for sign-in sheet)

Committee Chair Update

Outside of forwarding emails and setting up this meeting, most of my activity this year was related to the shovelnose sturgeon SOA listing issue

- 2008 Funding Requests
 - At last year's meeting we had three funding request for the Executive Committee
 1. \$21,500 for MICRA tag database
 2. \$19,500 for Darin Simpkins and Wyatt Doyle egg check study
 3. Money to be used as a match for genetic analyses that states need to conduct. No set dollar amount was set but we agreed to further develop this request after the meeting.
 - Funding for MICRA tag database approved during an Executive Committee conference call in April.
 - Darin and Wyatt did not get money in time to conduct their egg check study so this request was withdrawn.
 - Jan Hoover with ERDC in Vicksburg proposal to complete an companion egg check study that would focus on the effects of egg checks and transmitter implantation on swimming performance.
 - Offer to conduct study at their facility at no charge, however he needed \$15k to involve a veterinarian on the project
 - This request was presented to Executive Committee and was approved
 - Hoover later withdrew the proposal after they learned that their facilities were not sufficient for holding large sturgeon needed for this study.
 - Money was de-obligated in July.
 - The only request for funding to help pay for genetic analyses was for the evaluation study in Illinois, Kentucky, and Missouri.
 - The Executive Committee approved \$7,500 to be used as a 50:50 match for genetic analyses
- Devoted a small amount of time to the MICRA Commercial Roe Fish Harvest Database that we discussed last year.

- Not a lot of progress other than figuring out what we wanted in the MICRA database and what was needed by Law Enforcement.
- Most of those details have been worked out.
- Have started working with Brian Elkington to pull together databases from each state to find out what it will take to create the database.
- More on that later today.
- Also, compiled summary of commercial shovelnose sturgeon harvest data reported to each state in MICRA (Attachment 2).

MICRA's Position on SOA Listing – George Scholten provided a summary of how MICRA's position statement on SOA listing of shovelnose sturgeon was developed over the last two years.

Pallid Sturgeon Bycatch Assessment Plans in IL, KY, & MO – Greg Conover provided a summary of the study underway in IL, KY, and MO to evaluate the pallid sturgeon identification keys used by commercial fishers in these states.

Discussion:

- Jordan - Will whole fish be archived?
- Quinn – How many fish will be collected in IL? 400 – IL may have third sample from Chester area
- Burluson – How will IL estimate compliance? Will fishers know they are going to be checked?
- Finley - If IL can prove that this will work, will other state adopt this? Is 400 fish a large enough sample size to detect a fish as rare as a pallid sturgeon? Will monitoring continue?
- DeLonay – Did workgroups consider requiring commercial fishers identify species that they are allowed to take instead of fish they have to avoid (i.e., a more conservative approach).
- ? FWS – Do fishers have to recertify? What happens if they fail in the future?
- Jordan – Is IL providing similar training for LE?
- Chuck? FWS - Will all states close if certification is not effective?

Shovelnose Sturgeon Similarity of Appearance Listing Update - George Jordan provided a presentation of the draft proposed rule to list shovelnose sturgeon due to similarity in appearance to pallid sturgeon.

- Section 4 (e) of the Endangered Species Act allows a species to be listed due to Similarity of Appearance (SOA) to a species currently listed under the ESA if:
 - (A) enforcement personnel would have substantial difficulty differentiating between the protected and unlisted species;
 - (B) this difficulty is an increase threat to the protected species; and
 - (C) listing the species due to SOA will substantially facilitate enforcement of the ESA and conservation of the protected species.
- Supporting Data:
 - At least 1.8% of sturgeon harvested in Tennessee are pallid sturgeon (Bettoli et al. 2008).
 - Lost nets have resulted in documented lethal take of pallid sturgeon (Bettoli et al. 2008).
 - Higher maximum age of pallid sturgeon observed in areas without commercial harvest (Killgore et al. 2007).
 - 14 years with commercial harvest
 - 21 years without commercial harvest
 - Mortality rates of pallid sturgeon and shovelnose sturgeon nearly identical in areas where shovelnose sturgeon harvest is allowed and higher than areas where harvest is not allowed (Colombo et al. 2007).
 - Pallid sturgeon with egg check wounds and scars have been observed by researchers.
 - Existing morphological characters may not be 100% accurate. Based on morphological and genetic data.

Draft Proposed Rule:

Shovelnose are proposed to be listed as threatened where the two species are sympatric: Missouri River (Montana to confluence at St Louis, includes lower Yellowstone, Platte and Kansas rivers) and Mississippi River from Melvin Price Locks and Dams downstream to the Gulf of Mexico including the Atchafalaya distributary system.

- This draft proposed rule has several exemptions (provision provided under Section 4 (d) of the Act)
 - 1) allowing take associated with scientific investigations, conservation purposes, etc.
 - 2) exemption for recreational fishing.
 - 3) exemption for commercial fishing for non-*Scaphirhynchus* fishes.
- Additionally, a shovelnose SOA would not require: Section 7 consultations, recovery plan development, nor designation of critical habitat.
- The draft proposed rule has been submitted to Washington D. C. for review. If approved, the next steps are as follows:
 - A Federal Register announcement to inform the public of a proposed rule making. This will detail the proposed rule and define the public comment period.
 - Publication of a proposed rule after consideration of public comments due typically within 12 months of the Federal Register notice.

References Cited:

- Bettoli, P. W., M. Casto-Yerty, G. D. Scholten, and E. J. Heist. 2008. Bycatch of pallid sturgeon in a commercial a commercial fishery for shovelnose sturgeon. Fisheries report 08-10 submitted to Tennessee Wildlife Resource Agency.
- Colombo, R.E., J.E. Garvey, N.D. Jackson, R. Brooks, D.P. Herzog, R.A. Hrabik, and T.W. Spier. 2007. Harvest of Mississippi River sturgeon drives abundance and reproductive success: a harbinger of collapse? Journal of Applied Ichthyology. 23:444-451.
- Killgore, K.J., J.J. Hoover, J.P. Kirk, S.G. George, B.R. Lewis, and C.E. Murphy. 2007. Age and growth of pallid sturgeon in the free-flowing Mississippi River. Journal of Applied Ichthyology 23:452-456.

Discussion:

- Maltese: When did proposed rule go to WO? January 2009.
- Armstrong: Moving ahead with listing and not waiting on results of MICRA study? If new information is brought to bear, that information will be considered before a final rule is published. Time line should allow for results to be available
- DeLonay: Can anyone petition the FWS for listing and is the FWS obligated to respond? Was the letter from the COE considered a petition or why not? Not sure if another Fed agency can petition. COE letter was not considered a formal request. Data is really what drove the FWS to pursue the listing.
- Rouse: When do you expect the proposed rule to be published? Difficult to say how long it will take to get through the WO procedures. No required deadline.
- Ryckman: By-catch mortality and ghost net mortality: do the states have a way to estimate these? Lack of information largely. TN study provides small amount of information and data on these issues. At least one net lost each of the 5 or 6 days researchers accompanied fishers.

State Reports/Updates – states provided updates of their 2008 activities related to paddlefish and sturgeon

Kentucky 2008 Report - Doug Henley and Gerry Buynak

Discussion:

- Mestl: First come first serve for permits? Lottery system in 2010. Resident roe harvester permit is \$500, non-resident is \$1,500. Must also have a commercial fishing license. Also require roe buyers permits.
- Bronte: How active are these permittees? Some big players, more than we expected harvesting and buying large numbers. Main players: 40 reported harvest and 13 reported buying roe in November 2008.
- Herzog: How many roe buyer permits have you sold? 24 total, including 3 or 4 non-residents.
- Ryckman: How do you verify reports? Require monthly reports. Reports must be consistent from harvest through buyer. Records and reports are reviewed. Calls are being made about questions.
- Bronte: Are they required to report effort? Daily requirement for number and length of nets fished.
- Herzog: report paddlefish only or all roe species? Paddlefish, sturgeon, and bowfin. Also must report flesh.

- Maltese: Is price staying steady at \$80 or going down? Still at \$80 in W. KY and may be concerned about prices going down due to economic times.

Louisiana 2008 Paddlefish/Sturgeon Activities - Bobby Reed

Louisiana Dept. Wildlife and Fisheries (LDWF) reopened a recreational paddlefish fishery in 2007 following 21 years of closure. As previously reported, the fishery is one of incidental take only since it is unlawful to snag any fish in Louisiana except catfishes. All paddlefish more than 30 inches fork length must be returned to the water immediately. The 2008 season came and went without any problems and LDWF had about 5 inquiries as how to properly measure the fish. LDWF spent several months assessing fish kills and habitat damage following hurricanes Gustav and Ike. Estimated fish loss following the two storms totaled some 163 million fish of all species. Very large numbers of paddlefish died in the anoxic conditions but no sturgeons were noted in any of the areas. The extremely high river stages of late spring and early summer prompted the USACE to open the Bonnet Carre spillway north of New Orleans to reduce the flooding potential. Fisheries samples taken after the spillway was closed resulted in the entrainment of at least 12 pallid sturgeon and some 50+ shovelnose. Entrainment issues are now being discussed between the USACE and the Lower Basin Pallid workgroup. LDWF continues to cooperate in the lower basin pallid sturgeon telemetry study in the Atchafalaya and Mississippi rivers.

Arkansas 2008 Report - Jeff Quinn

Discussion:

- Maltese: What is Mississippi State project? Part of Paul Hartfield's project to track movements and habitat use of pallid sturgeon in the lower Mississippi River.

Mississippi 2008 Report - Garry Lucas (Commercial Fisheries Coordinator, MDWFP)

In May 2007 the Mississippi Wildlife Commission closed the season for commercial harvest of paddlefish. During the 2008 session the Mississippi Legislature modified state statute to permit the Commission to issue permits for the commercial harvest of paddlefish, and to make violations of regulations concerning paddlefish a class 1 violation.

The Wildlife Commission established regulations on commercial harvest of paddlefish:

- Special Permits needed to harvest paddlefish and to buy roe
- Opened border waters with Arkansas, with 34" EFL length limit
- Season - December 1, 2008 to March 31, 2009
- All harvested paddlefish must be tagged and eggs cannot be removed till fish reach processing location
- Buyers must report sale within 24 hours
- Three persons purchased Harvester permits and one person purchased Processor Permit

Discussion:

- Maltese: Any non-resident harvesters? No non-resident paddlefish harvester permits.
- Reed: Going to check rostrums for CWTs? Yes.
- Oliver: Did you say that the fish cannot be cut at all until the fish get to the processor or egg buyer? Yes, fish have to be at an approved facility before the fish can be cut.
- Reed: Approved by MS health department? Yes.
- Reed: LA bowfin process is the same.
- Herzog: How are you dealing with complaints that eggs will go bad if not immediately removed from fish? Allowed to cut rostrum and tails so that fish can be more easily put into coolers.
- Buynak: KY does not allow for paddlefish to be cut on the water. Some fishers are attempting to get permits to transport fish live. One fisher is placing them back into a private pond to recoup before taking to processor.

Tennessee 2008 Report - George Scholten

The 2007-2008 fishing paddlefish season had the 3rd highest harvest on record with commercial fisher reporting nearly twenty thousand pounds of roe harvested. Paddlefish regulations changed several times in 2008. Tennessee started the year off with a management plan in place for the Tennessee and Cumberland river systems. Arkansas, Mississippi, and Tennessee developed a plan for the Mississippi River over the summer. The Tennessee Wildlife Resources Agency presented the Tennessee Wildlife Resources Commission with the management plan at their

September meeting as well as with a regulation change regarding evisceration of paddlefish roe (Tennessee summarized each states roe evisceration regulations and can provide to anyone who is interested). Instead of implementing management plan for the Mississippi River plan, the Commission voted to remove all management plans and removed previously enacted seasons and size limits (effective November 7). At their November meeting the Commission enacted a 36" minimum eye to fork length limit for the Tennessee and Cumberland rivers and a 34" minimum EFL limit on the Mississippi River. They also passed a statewide season that will be open from November 15 through April 15 each year. These regulations went into effect on December 2, 2008 and the Commission requested that no changes be made for three years.

Discussion:

- Burleson: Do they still have reporting requirements? Yes.
- Bronte: Are the number of permits capped?
- Gnam: How many pounds of eggs can be harvested within this 10 percent? Maybe 1,000 pounds?

UMRCC and Iowa 2008 Report – Kirk Hansen

Nebraska 2008 Report Gerald Mestl

Nebraska Paddlefish Studies: Jaw tags were placed on 134 paddlefish in the Fort Randall Dam to Gavins Point Dam reach this year, bringing the total of jaw tagged paddlefish in the study area to 244. Seven paddlefish have been recaptured in 2008, bringing the total of recaptured jaw tagged paddlefish to 9. Two paddlefish jaw tagged in the study reach have been recaptured by below Gavins Point Dam in 2008. The current estimate of the paddlefish population in the Ft. Randall Dam to Gavins Point Dam reach of the Missouri River is $3,695 \pm 167,096$.

Approximately 45% of the paddlefish in Ft. Randall Dam tailwater have been coded-wire tag recaptures—most of which were hatchery-reared paddlefish from above Fort Randall Dam (100% of decoded tags collected in 2007). Length-frequency distributions from the Ft. Randall tailwater suggest wild and hatchery produced paddlefish have different length-structures ($KS_a=1.126$, $P=0.0846$) and hatchery-reared paddlefish may not be reaching sizes large enough for female maturity. We will be aging a subsample of paddlefish from this reach in 2009 and continuing to investigate this difference in size.

Downstream from Gavins Point Dam we tagged approximately 275 paddlefish with jaw bands. We collected jaws and gonads from approximately 120 paddlefish for age and life history analysis. Drop boxes were used to collect rostrums during the archery and snagging seasons. We conducted the long term juvenile paddlefish trawling survey on Lewis and Clark Lake. Mean catch was 0.12 paddlefish per minute which was below the long term (1965-2008) mean of 0.27 and long term median of 0.17

North Dakota 2008 Report - Fred Ryckman

There are two mostly discrete stocks of paddlefish in North Dakota. Over the years, and especially in the past decade, NDG&F has committed significant resources towards learning more about life history characteristics and proper management of each of these stocks.

One stock (called the Yellowstone/Sakakawea stock) resides in Lake Sakakawea, in the reach of the Missouri River upstream from Lake Sakakawea to Ft. Peck Dam, and in the Yellowstone River. NDG&F jointly manages this stock with MT FW&P. No commercial harvest of paddlefish is allowed in ND (or MT), but each state allows for a regulated snag fishery on this stock. For the past several years these snag fisheries have been limited to an annual harvest cap of 1,000 fish in each state, and by a restriction that a snagger can only harvest one fish per state per year. High grading of fish is not allowed; snaggers must keep any fish that they snag during mandatory snag and harvest days/periods and release any snagged fish during mandatory snag and release days/periods. Each state also allows a non-profit fish cleaning/egg processing entity to process and sell caviar (annual operation since 1993 in ND). These entities are required to clean all legally harvested fish (males and females) which are brought to them; eggs from females are processed in exchange for the fish cleaning services. Snaggers may retain eggs for their personal use, but are not allowed to sell, barter or trade them. NDG&F receives 25% of the annual net profit from the processing entity to use fund paddlefish research, management and enforcement activities. Each of the fish cleaning/egg processing stations are required to collect a wealth of biological and other information from each fish which is processed. NDG&F annually tags about 400 adult paddlefish from this stock in late April, just prior to the annual snagging season which opens on May 1. Jaw tag recoveries during the subsequent ND and MT snagging seasons from these fish are used to estimate exploitation, the size of the spawning run of adult fish, fish movements,

etc. Jaw tag recoveries and biological information taken from processed fish that had been tagged over the previous 30+ years also provide a considerable amount of additional information. Annual reproduction surveys and associated plankton sampling are conducted in the upper end of Lake Sakakawea. Survey results are used to estimate relative success of reproduction and potential year class strength, distribution and seasonal timing of YOY fish. On years in which substantial numbers of YOY fish are observed, netting and coding wire tagging efforts are undertaken. NDG&F coded wire tagged slightly over 7,000 wild YOY paddlefish in 2008, bringing the total number of wild YOY tagged since 1996 to nearly 20,000. The number of YOY observed, netted and tagged in 2008 were by far the highest since this work was initiated in the early 1990s.

The other stock resides in Lake Oahe and the reach of the Missouri River upstream of Lake Oahe to Garrison Dam. This stock may be augmented by fish which move through Garrison Dam; studies are currently being conducted to determine, amongst other things, the extent if any of this augmentation. Netting and jaw tagging efforts have been undertaken over the past few years; these efforts are intended to yield information relative to this stock's population size, movements, etc. This stock is currently unexploited; no snag or commercial fishery has ever been allowed on this stock.

Discussion:

- McNair: When you reach your harvest cap, do you continue a snag and release season? We used to have a 60 hour notice before fishery was closed, this has now been reduced to a 48 hour notice. Two days a week are set aside for mandatory snag and release during the regular season. Current regulations allow for an additional 7 days of mandatory snag and release fishing once the harvest cap has been reached.
- Bronte: How do you know when you are approaching the harvest cap? The number of fish cleaned at the processing station is monitored and matched with previous years' phone survey results that snaggers take from 85-95% of harvested fish to the cleaning station. The current year's estimated running total harvest is based upon these considerations.
- Henley: Clean both male and females? Yes, the cleaning operations are required to clean all legally harvested fish which are brought to them. However, it is not a requirement for anglers to take their fish to the cleaning station.
- How many of the 1,000 fish are egg bearing? Ratio in past years was typically about 50% male/female, with also about 50% of the females above and below 70 pounds. The 1995 year class is so strong that it has skewed the harvest to approximately 70% males in recent years, as males (but not yet females) from this year class have matured and entered the spawning run and are now vulnerable to the snag fishery. Since the snag fishery occurs on a spawning run of fish, virtually all females are in spawning condition.

Overview of Arkansas Paddlefish Management Strategy -Mike Armstrong

Discussion:

- Bronte: Peak of permit sales? 83 harvester permits.
- Scholten: Are studies funded entirely from commercial license sales. No, commercial license revenue goes into general fund. Paying out of department funding each year. Only making \$40,000
- Buynak: What are the metrics for modeling Mississippi River? Using FAST, will look at SPR.

ODWC Paddlefish Research & Processing Center - Brent Gordon

Paddlefish (*Polyodon spathula*) populations have declined in their native range over the past century due to destruction of habitat, over harvest by poachers for their valuable roe and other factors. With a world class paddlefish fishery located on the Neosho River system, snagging has gained in popularity over the past two decades. Therefore, monitoring is imperative to prevent over harvest. On February 18, 2008 The Oklahoma Department of Wildlife Conservation (ODWC) opened the Paddlefish Research and Processing Center (PRPC) at Twin Bridges State Park. The anglers in the area voluntarily brought their paddlefish to the center and allowed us to obtain data from the fish, in return for getting their fish cleaned and packaged. The roe from the females that were brought in was donated to the department and processed into caviar for legal sale on the world market to fund future paddlefish activities. The average weight and length of the females was 17.391 kg and 1014 mm respectively. While the average weight and length for males was 11.418 kg and 913 mm respectively. The findings of this ongoing study will give biologists an independent stock assessment of the paddlefish population located in the Neosho River system above Grand Lake.

Discussion:

- McNair: Did you search the data for percentage of eggs based on size of fish? Yes, but found it difficult due to variations in ovaries and condition of eggs. We did not compare weight of eggs to total weight of fish. I would suggest also looking at age of fish. McNair: Does the data support a general rule of thumb that green egg weight is about 10% of body weight.
- Oliver: Did you see much mortality from snag and release? Regulations have been changed from barbed to barbless hooks. Many of the fish had several scars. Telemetered fish was snagged and released and continued to show up for some time.
- McNair: Rendering plant in Carthage took the fish for free. Local landfill also was willing to take for free. Do not know how much oil the 45 tons of paddlefish produced.
- Yasger: How much did this program cost the state? \$500k to set-up plus man hours to operate.
- Finley: Did revenue cover the operational costs? Generated about \$1.5 million. Buyers really liked the program because they new the eggs were legally harvested and how the eggs were processed

2008 Table Rock Reservoir Paddlefish Case - Ralph McNair

Officer Mc Nair provided a summary of a case involving paddlefish poaching in Table Rock Reservoir, MO.

Discussion:

- Burleson: Need to estimate the number of fish that were harvested to obtain 170 pounds of eggs.
- Maltese: has citation she will send to Dan and Ralph.
- Posey: AFS has blue book of fish values for
- Armstrong: Where was the reported harvest from? Arkansas River, Ozark pool. Posey: Nix reported a number of fish harvested from Arkansas River on his falsified reports.
- Ryckman: Was Continental Caviar aware of source of eggs? Claimed to know nothing of the eggs source from Table Rock Lake.
- Burleson: Records will prove valuable in sentencing, because charges will be based on value of fish (flesh and eggs).

Paddlefish-Sturgeon Law Enforcement Issues - Group Discussion

- Lane: 6 state LE meetings (2x / year) began in mid-90s.
- McNair: Similar multi-state LE meetings with MO, OK, KA. Biologists welcome to attend these meetings.
- Posey: Any opportunity for getting the IRS involved?
- Burleson: Generally don't get involved in cases involving millions of dollars. Might be able to get a field audit, but they don't have the resources to bring them in at the ground level. It's possible but tough.
- Finley: Seeing more fish with egg checks, what do officers need?
- McNair: Things that don't look right are usually good signs that something isn't right.
- Burleson: Officers would prefer you report suspicious activity, than to not know there are potential problems. Biologists information and assistance is valuable.
- Bronte: Does anybody have a gut feeling for the amount of illegal take?
- McNair: Probably different from year to year.
- Burleson: KY is a good example; with the new reporting requirements KY has seen 4,000 pound increase in reported harvest.
- Buynak: Snag fish are certainly be sold.
- Scholten: TN fishing pressure was low last year, but one of the highest reports of eggs bought. Those eggs had to come from somewhere.

2008 Paddlefish Production and Tagging by the Missouri Department of Conservation - Trish Yasger

The Missouri Department of Conservation (MDC) maintains paddlefish populations in Table Rock, Lake Ozark and Truman by annually stocking. Paddlefish Broodstock are collected at Table Rock and if needed at Lake Ozark. The 2008 paddlefish request was 65,750 fish.

Paddlefish were spawned at Blind Pony Hatchery in Sweet Springs, MO during April, and fry were stocked into hatchery ponds in April and May. We anticipate a 15-20% return on stocked fry. In 2008, we had ponds with

up to an 80% return; we averaged a 40% return on all stocked fry. On the first day of tagging we realized we had a lot more fish than expected and not enough tags to get them all tagged.

Many calls for help went out. Additional tagging days and taggers were needed. MDC rush ordered an additional 65,000 tags, of which MICRA paid \$1,500 towards the cost of the tags. Tagging machines were loaned to us from Gavins Point National Fish Hatchery and Kansas Department of Wildlife and Parks. Joanne Grady sent out an urgent plea for any excess tags. Tags started coming in from all over the basin. We were able to find old batch sturgeon tags in some of Kim Graham's old boxes and more at Neosho National Fish Hatchery. Tags for wild caught fish came in from Iowa, Illinois, Kentucky and Minnesota/Wisconsin. Hatchery tags came in from Arkansas, South Dakota, Tennessee, Oklahoma and West Virginia. All excess tags were sent to Columbia where Joanne and Brian Elkington checked them against the MICRA database to verify that they were good to use; and made sure that we did not use any batch tags that were already out in Basin waters. We tagged 57,607 fish with the excess tags we received. We used the batch sturgeon tags first and then moved on to tags for wild fish. Unused wild fish tags were sent to Joanne Grady for safe keeping, in case of a similar emergency in the future. Except for Arkansas, that received tagged fish, all hatchery tags were returned.

During 11 days in October we were able to harvest, tag and stock ALL 265,345 fish; this was our biggest production year ever! They were distributed in the following manner:

Lake of the Ozarks	88,413
Truman Lake	55,682
Table Rock Lake	20,307
Black River	1,000
Missouri River, (Missouri)	69,387
White River (Arkansas)	20,481
Beaver Lake (Arkansas)	10,075

We were fortunate to have such great cooperation from everyone in getting a project of this size completed. Thanks to everyone's help, we were able to harvest, tag and stock all 265,345 fish! Thank You.

Discussion:

- Campbell: Region 4 was not aware of this need and has 4 machines that could have been made available.
- O'Bara: Why was production so good? Yasger: Don't know.
- Campbell: Private John Allen Hatchery had great production this year.
- Conover: Lessons learned? Do we need an agreement to fish from being stocked without tags? Should MICRA purchase a supply of emergency tags for future needs?
- O'Bara: How many states are continuing to stock fish? SD, MO
- Elkington: From data integrity standpoint, untagged fish in the lower MO river would be a very bad thing.
- Scholten: Is there an action item here?
- O'Bara: I think so, but more discussion is needed? Should we be stocking that many fish from a small number of broodstock? There may not be a signed agreement for the paddlefish project.
- Scholten: Sounds like we need to evaluate the tagging protocol.
- O'Bara: During a previous meeting the group agreed to stop tagging wild caught fish but to continue tagging hatchery fish. There was no signed agreement though.
- Ryckman: Have there been hatchery fish that haven't been tagged?
- O'Bara: Yes, I know at least in upper Ohio River.
- Scholten: Does everyone agree that all hatchery fish should be tagged? Yes, necessary for evaluation.
- Buynak: KY considering private stocking of public waters.
- Yasger: Reservoir ranching is becoming more common and those fish can escape.
- Scholten: Would it help to have a written agreement and to review the tagging protocol?
- Buynak: Reservoir ranching in KY is producing all female stocks.
- Maltese: FWS cannot stop export of live paddlefish unless it will affect the wild population in the receiving country.
- Gnam: Would like to explore the KY situation; more discussion is needed regarding the effects of reservoir ranching on wild populations in US.
- O'Bara: Should also consider disease issues. Really talking about a stocking protocol for paddlefish.
- Scholten: Willing to work with the stocking states to develop a stocking protocol.

- Reed: Motioned that the p/s committee revisit the paddlefish stocking protocol and revise where necessary. Dave Herzog seconded the motion. The motion passed without objection.

Summary of Paddlefish Harvest in the US - Jeff Quinn

Paddlefish have been intensively harvested in both sport and commercial fisheries. Recent harvests (2000-2006) were surveyed from state agencies and compared to historical harvest data (1965-1975). Seven major sport fisheries had recent annual harvests greater than 1,000 fish, and most large sport fisheries appeared to have sustainable harvests due to intensive management. Recent commercial harvest was greater than sport harvest across the species' range. Most of the commercial harvest was from Arkansas, Kentucky, and Tennessee. Annual commercial harvest from the Ohio River increased from 6,000 kg to 196,000 kg from 1965-1975 to 2000-2006. Annual harvest remained substantial from the Arkansas River (37,000 kg), the lower Tennessee River (121,000 kg), and the Mississippi River (103,000 kg). Harvests of paddlefish (sport and commercial) compiled from the literature were highly variable and ranged between 0.01 to 5.06 fish/ha and 0.04 to 43.43 kg/ha (median = 0.12 fish/ha, 1.73 kg/ha). Stock depression has been associated with a first-year harvest as low as 1.46 kg/ha, and harvests > 5 kg/ha were usually associated with overfishing or opening a previously closed fishery. Case-histories from the Tennessee and Ohio River systems documented that paddlefish were susceptible to overharvest in lentic waters and river-reservoirs, but the threat posed by commercial harvest from large rivers will remain unresolved until more fisheries-independent data becomes available. Anthropogenic alterations to habitat, over-reliance on harvest data, and lack of fisheries-independent data limit our historical understanding of the degree of threat that harvest is to paddlefish populations.

Discussion:

- Bronte: Are you surprised by how low the sport harvest numbers.
- Quinn: I think the numbers are about what I expected them to be. The paper will be in the paddlefish book that is coming out.
- Hanson: What year did the unusually high harvest below KY dam occur? Scholten: mid to late 70's. Hanson: When was the dam built? Bronte: 1944.

MICRA paddlefish tag database update - Brian Elkington (Attachment 3)

Commercial Roe Fish Harvest Database Update and Discussion (George Scholten and Brian Elkington demonstration)

- 3 databases proposed
- 1) Database for harvester information: who is licensed and where
 - o Do states have unique identification number for individual fishers?
 - o Have considered using name and date of birth if states don't have a unique id for each fisherman.
- 2) What was harvested and where tracked by commercial fisher.
 - o Date of harvest, who purchased roe, cites export number
 - o Is there a way to track a single fisherman's status as a resident and non-resident fisherman in different states? Yes
- 3) Disposition table
 - o Amount of eggs, amount of meat, buyer id, seller id, date of purchase
 - o Are eggs tracked beyond first sale?

Discussion:

- Ryckman: Some type of standardized reporting would be beneficial.
- Elkington: Have seen
- V: will this be available through MICRA website? No, it will likely just be made available to LE personnel.
- Maher: How safe will this information be from a FOIA?
- O'Bara: EB was concerned about the fisher's identification information. May eventually need a legal opinion on this issue.
- Posey: Could it be denied because of business proprietary reasons? If MICRA is not a governmental agency then the organization should not be subject to FOIA.

- Burleson: There is a LE data center in Springfield, MO that compiles and provides data, but does not house it. They would send compiled data to representatives from different states and FWS. Standardized data would be beneficial.
- Scholten: We are developing the database that we need, but don't know that MICRA would ever be the entity to house the data. A group like Dan described may ultimately be the group to house the database.
- Burleson: Key is to be able to match harvest with roe buying/selling records. This would also benefit the FWS in approving export permits.
- V: This would be very beneficial.
- Maltese: This goes back to what we've talked about for years about standardized data from all of the states. Can we go back to a discussion about standardized reporting by all states. If all reports and data are standardized the states could house the data.
- Finley: A clearing house is really necessary. Benefits LE, biologists, and CITES staff to have all of the information compiled together.
- Maltese: Comes back to standardized reporting.
- Scholten: We likely will not be able to standardize the reports, but can standardize the data that is being collected on the different state reports.
- Elkington: Data from the different states looks very familiar.
- Scholten: All states are collecting data daily, but reporting monthly.
- Hanson: Iowa only requires monthly reports.
- Scholten: MICRA EB has discussed this and there is general agreement and support to standardize data if the changes are minor.
- Bronte: Do states also collect effort data? Yes.
- Burleson: All but 3 states require a roe buyers permit? I think we are very close.
- Burleson: MOCCIC? Greg Jackson has provided paperwork for FWS to become part of group. Dan and Brian can meet with the group to show them the template and discuss further.
- Scholten: Provide Brian comments. Database will be sent to states. At that point we can see what is needed so that all of states data are standardized.
- Burleson: One issue is how long of lag time there would be between data collection and data availability.
- Gnam: Data is subject to FOIA at whatever point it is provided. Need to pursue data protection in advance.
- O'Bara: MICRA's product may be a blank database and set of standardized data from states.
- Scholten: That is enough direction for the committee for now. We do not have the right people here today to resolve the FOIA issues.

Wednesday, January 21st - Reconvened at 8:00 am

Use distributions, movements, and resource selections of blue suckers in the Middle Missouri River - Ben C. Neely, University of Nebraska (Presented by Gerald Mestl)

Blue suckers *Cycoreptus elongatus* are benthic fish endemic to the Middle Missouri River, Nebraska and considered threatened throughout their range. The objectives of this study were to evaluate seasonal use distribution areas, identify movement patterns, and quantify resource selection surrounding spawning activities of blue suckers using acoustic and radio telemetry. Use distribution areas of blue suckers varied widely and were significantly different between seasons. Blue suckers occupied the largest areas in spring (mean 90% use distribution \pm SE; 174.9 km \pm 13.1 km), followed by fall (78.6 km \pm 9.9 km), and summer (8.1 km \pm 5.3 km). Blue suckers began upstream migrations in fall when water temperatures decreased to approximately 13EC and continued until water temperatures neared 0EC. Migrations continued in spring when water temperatures increased above 1EC until mid-April when water temperatures reached 11-13EC when presumed spawning occurred. Blue suckers returned downstream following their migratory apex to a core area they occupied preceding their fall migration. Resource selection of blue suckers was evaluated seasonally to determine the diversity of habitat requirements surrounding spawning. Blue suckers generally preferred habitats outside of the channelized Mainstem Middle Missouri River during the inferred spawning season (i.e., Big Sioux River, Iowa / South Dakota, the unchannelized portion of the Middle Missouri River and Platte River, Nebraska). Blue suckers preferred habitats within the channelized Middle Missouri River in summer and fall (i.e., inside bend, outside bend, inside bend channel border, channel crossovers). The broad geographical range required by blue suckers, coupled with their diverse habitat requirements, emphasizes

the need for interjurisdictional management of the species and restoration of riverine habitat heterogeneity lost to the effects of anthropogenic modifications within the Missouri River Basin.

Discussion:

- Use of resource? None, really.
- Collection method? Electro-fishing from revetments.
- Recruitment? We don't see it annually, but we do see it on high flow years.

Accuracy and Precision of Age Estimates Obtained From Pallid Sturgeon Fin Rays - Jeff Koch and Kirk Steffensen, Nebraska Game and Parks Commission and Mark Pegg, University of Nebraska-Lincoln (Presented by Gerald Mestl)

To examine accuracy and precision of pallid sturgeon age estimates, we recaptured and removed the marginal pectoral fin rays of 36 known-age pallid sturgeon stocked into the Missouri River. Pallid sturgeon varying in age from 1 to 7 years and representing six year-classes were used in the study. The fin rays were independently aged by three readers, and a consensus age was assigned when all individual age estimates did not agree. Exact between-reader agreement varied from 30% to 36% and agreement within one year was around 70%. Accuracy of individual age estimates varied from 28% to 42%, but most derivations from the known age were within one year. Two of three readers over-aged the majority of pallid sturgeon; especially samples young fish. Aging was hindered by extremely poor readability of the sections, which is likely due to the influence of captive rearing and the stress associated with stocking. Although fin rays will most likely remain the preferred structure for aging pallid sturgeon, further studies are needed to improve annulus recognition in pallid sturgeon fin rays.

Discussion:

- Any correlation w/length class, assuming healthy fish? Gerald don't know, but w/paddlefish length means nothing.

Paddlefish Book Update – George Scholten

Provided a summary of status of each chapter and fundraising (Attachment 4). Hoping to have book wrapped up in next few months so it will be published in 2009. Still waiting on several funding sources. Following up on funding pledges.

Field endoscopy of river sturgeon in the Lower Mississippi River. Jan Hoover (US Army Engineer Research and Development Center - Waterways Experiment Station)

Data on reproduction are required for effective population modeling of sturgeon but are difficult to obtain for endangered or protected species due to prohibitions on destructive or potentially injurious sampling. Endoscopy, a minimally invasive and safe diagnostic technique traditionally used in veterinary and laboratory settings, was evaluated for use in field studies of sturgeon in the Lower Mississippi River as part of an inter-agency "rodeo" near Tunica, MS (RM 681-694), 29-31 Jan 2008, during inclement weather. Field protocols were established, personnel were trained, and surgical technique evaluated 30 Jan. Training continued and population assessment took place 31 Jan. Twenty-nine shovelnose sturgeon (363-733 mm FL), two pallid sturgeon (710, 720 mm FL), and one morphologically intermediate sturgeon (698 mm FL) were collected, anesthetized, insufflated, and examined telescopically, biopsied, and photographed prior to recovery and release (Some fish were also implanted with ultrasonic tags). Shovelnose sturgeon sex ratio was near unity (male: female = 0.8: 1.0). Most males (84%) had medium to large, white or pink testes. Nearly half of females (47%) had large yellow or black eggs. Two shovelnose sturgeon were transgender. Pallid sturgeon were both immature females. Subsequent histological analyses indicated that gender assignment based on field observations and photographs was correct for > 90% of all individuals. Study demonstrated that endoscopy is an effective and practical field technique for establishing gender, reproductive condition, and gonadal anomalies. Repeated endoscopic sampling of a population can provide additional data on onset and duration of spawning season, chronology and duration of gonadal stages, and percentages of adults likely to spawn. Endoscopy can also be used to estimate fecundity and other parameters required for empirically based models of population viability.

Discussion:

- How field durable is the field endoscope? Very field worthy. Needs to be set up under a shelter, must be planned for, and have to make special provisions for it. Portable. Need a small generator ~1500 w.

Missouri Department of Conservation Sturgeon Studies. Dave Herzog

The Missouri Department of Conservation is continuing efforts toward enhancing and protecting sturgeon populations. Shovelnose sturgeon, pallid sturgeon, and lake sturgeon information has been monitored through several studies. Lake sturgeon movement information is being completed using telemetry and is being published under graduate theses from Western Illinois University and agency reports through the MDC. Sturgeon life history information has been collected through collaborative efforts with Southern Illinois University at Carbondale and the US Army Corps of Engineers. Many manuscripts and reports are available from these efforts. Additional sturgeon efforts are being completed by the Missouri River field station. From their efforts the 2008 sampling highlights include: 1) the use of trotlines increased pallid sturgeon catch and 2) overall, the catch of smaller (<170 mm) *Scaphirhynchus* increased. Large scale migration patterns of sturgeon and many other fish species on the Missouri and Mississippi Rivers are being monitored, in part, using a stationary telemetry array through collaborative efforts with state departments of transportation. For additional information contact: Dave.Herzog@mdc.mo.gov

Discussion:

- Sampling of lower Osage River? No, essentially MO River study. They will be looking at tributary systems/Osage River.
- Lake sturgeon near AR? Seem to be tailing off in lower Miss-or could be b/c of the larger extent of the system and the need for greater effort.
- Shift to studies of pallid/sns. Sampling began in 2002 w/experimental gillnets set in over-wintering areas.
- Pallid study n=92 ~85% hatchery origin
- Sns ~6700 trotlines very effective in capturing.
- Tagging recapture rate increased from 2.7-4.4% in 2008.
- Have you looked into GPS tracking? Works w/satellite transmitters and there isn't anything small enough at this time. Signal just isn't effective at this time.-fish are too small too-may work for paddlefish, but not pallids or sns.

Iowa Department of Natural Resources 2008 Sturgeon Sampling. Kirk Hansen

Monitor pop in Pool 12, Miss River. Pools w/highest harvest are associated w/large tribs. Good tag retention-95%, no readability issues. 86 recaptures, most out of Pool 18.

Discussion:

- Would like to compare AR White River sturgeon w/IA Cedar River fish.

Biology of the Shovelnose Sturgeon in the Wabash River: From the Landscape to the Genes - Jon Amberg (Department of Forestry & Natural Resources, Purdue University)

Shovelnose sturgeons (*Scaphirhynchus platyrhynchus*) are native to the Mississippi and Missouri River drainages and though they have been extirpated from some areas, some populations still maintain modest commercial fisheries. One such fishery currently exists on the Wabash River in Indiana. This is one of the largest spawning populations and, unfortunately, very little is known about it. Therefore, the Indiana Department of Natural Resources and researchers from Purdue University have combined efforts to determine population structure, identify critical habitat, assess baseline health information, understand stress and immune responses and identify the cause(s) of feminized males: all to help manage this Wabash River population. During April of 2008, 61 shovelnose sturgeons were collected near river mile 300 of the Wabash River. Only nine of the fish collected were female; suggesting a possibly skewed sex ratio. All fish were bled, necropsied, and liver and gonad tissues collected. Blood chemistry was similar between genders, except we found elevated levels of aspartate aminotransferase and glucose in males. This suggests possible differences in energy partitioning between genders. Four of the 52 males were found to be partially feminized. Expression analysis of genes known to regulate testicular or ovarian development suggests that sexual differentiation in shovelnose sturgeon may differ from other species. However, genes like *Dmrt1* and some of the *Sox* genes may be able to be used as a molecular biomarker to identify gender and/or the level of sex-reversal in males. Future work includes, but is not limited to: 1) determine spatiotemporal movements with ultrasonic telemetry, 2) identify specific staging and spawning habitat characteristics, 3) better describe population structure, 4) evaluate culture techniques for supplementing natural recruitment and 5) delve deeper into why some males are partially feminized.

Discussion:

- Are you testing for the gene or the gene by-product? There aren't enough antibodies for fish identified, so we're taking a step back and looking at the blood screening.
- There's high variation in the inter-sexing, so we may be seeing the gene expression, but need a larger sample size.

Spawning movement, habitat use and behavior of shovelnose sturgeon and pallid sturgeon in the Lower Missouri River - Aaron J. DeLonay

Discussion:

- Are you seeing any spawning late in the summer? Spawning w/sns can be quite protracted from April-late July, even into August.
- There is no single spawning location for sns. Spawning occurs over a range of conditions. Patterns of spawning may vary by species and sex. If all of these are true for pallids, it can be detrimental to a rare species, b/c of the need to find another fish in spawning condition.
- Hatchery raised pallids are growing, spawning, and surviving.
- Pallids spawning in outside bends, deep water, coarse substrate. Immediate loss of habitat-probably building of railroads in the 19th century. Build habitat now? Remove wing dykes, expose bluffs on Missouri River.
- Hatchery fish are '92 and '97 fish; good size, high fecundity. Guess? Most are '92. They're all cwt from the hatchery. Pallids spawned earlier than expected.
- More common species, more flexible in habitat type, high abundance, can find mate rapidly. However, w/rare species, w/opposite requirements, mate location is much more difficult.
- DST tags ~\$250. More practical for ocean fisheries. USGS will probably continue to use telemetry.
- Lower Missouri River habitat quality to be a bigger issue. CWT reader detects just about everything, including DST tags.
- Transmitter failures? All failed in 2005, since then they've been very reliable.

US FWS Division of Scientific Authority - Marie Maltese

US FWS Division of Management Authority - Jorge Villavicencio

- CITES is an international agreement that has been signed by approximately 175 nations called "Parties."
- Pursuant to Article IV of the CITES treaty, "the export of any specimen of a species included in Appendix II shall require the prior grant and presentation of an export permit."
- There is a two part process in order to issue an export permit.
- Article IV of the Treaty states, that an export permit shall only be granted when:
 1. a Management Authority is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; *and*
 2. a Scientific Authority of that State of export has advised that such export will not be detrimental to the survival of that species.
- In order to make a finding of legal acquisition, the applicant must provide DMA with documentation demonstrating an unbroken chain of custody, or sequential ownership, from the fisher, through all intermediaries, to the exporter.
- Example: Fisher → Company A → Company B → the U.S. exporter of record.
- This might be accomplished by providing copies of:
 1. valid fishing licenses,
 2. harvest reports for fishers
 3. sales records/invoices
- Submit a completed application (Form 3-200-76) to the Division of Management Authority, Branch of Permits.
- Documentation demonstrating legal acquisition of the flesh or roe.
- Allow a *minimum* of 45 days for processing.

- At the time the application package is submitted to DMA for review, copies of the following documents are required:
 1. all valid fishing licenses at the time of the take, for all fishers who provided product.
 2. all harvest reports for the flesh or roe proposed to be exported.
 3. all invoices from all transfers of the flesh or roe proposed to be exported.
 4. all copies of dealers permits/licenses from all intermediaries.
 5. For roe, labels.
 6. For roe, the CITES Caviar Universal Label Code that appears on the label.
 7. an electronic version of the inventory list, in MS Word format.
 8. applicant's USFWS License to conduct the activity of an importer/exporter.
 9. a limited power of attorney if we are to interact with anyone who is not an employee of the applicant's company concerning the application package (Privacy Act issues).
- The file will remain at a "pending" status until:
 1. A "no-detriment" finding is received from DSA, and
 2. The State agency involved in the protection of fish and wildlife where the roe/flesh was harvested has verified lawful harvest/transfer of the roe or flesh.
- DMA relies heavily on the States to verify that:
 1. The fisher/dealer was permitted/licensed.
 2. The body of water was open to harvest.
 3. The harvest reports were submitted to the State in accordance with State Administrative Code, Executive Order, or Proclamation.
 4. The harvest reports were not altered.
- DMA will not make a finding of legal acquisition until the State or States involved respond to its inquiry.
- Irregularities have been found:
 1. Altered harvest reports.
 2. Harvest reports that were not submitted in accordance with State Administrative Code, Executive Order, or Proclamation.
 3. Harvest reports submitted more than once for the same roe
- The European Union has "Stricter Domestic Legislation" requiring an import permit for the consignment.

2008 Trade Data

Shovelnose Sturgeon Roe Packaged as Caviar

- Seven exports through two ports, Miami (1, to Belgium) and Seattle (6, to Japan)
- 441.04 kg (972.33 pounds) of Shovelnose sturgeon roe.

Paddlefish Fingerlings

- One export through one port, Chicago
- 2,000 fingerlings

Paddlefish Live Eggs

- Six exports through one port, Chicago
- 160,000 live eggs

Paddlefish Roe Packaged as Caviar

- Exports through five ports (Miami, Los Angeles, Seattle, and Chicago).
- 9,297.49 kg (20,497.46 pounds) of paddlefish roe.

Seven Exporters of Roe

- Optimus, Inc. d/b/a Marky's
- Great Atlantic Trading
- Bemka Corp.
- Maison Du Caviar
- Agro Gourmet
- Pacific Fish & Seafoods
- Unifood, Inc.

One Exporter of Fingerlings and Live Eggs

- Osage Catfisheries

158 TOTAL EXPORTS from January 22, 2008 through December 29, 2008

Discussion:

- Rose: wants to know how much is being used domestically. US is one of the largest consumers of caviar in the world.

2009 Budget Requests

Discussion:

- Columbia National Fish and Wildlife Conservation Office needs \$30,000 to maintain MICRA stock assessment database
- Columbia National Fish and Wildlife Conservation Office would need an additional \$30,000 to design and maintain Commercial Roe Fish Harvest Database
- Doyle-Simpkens - Egg check study is still an option and of interest to the Paddlefish-Sturgeon Committee
- MICRA may not have the funding for it this year.

Committee Decision:

- Scholten to bring \$30,000 request for MICRA Paddlefish Tag Database to Executive Committee for funding.
- If funding available, Scholten to convene conference call regarding egg check study.
- Scholten to seek direction from Executive Committee on funding for Commercial Roe Fish Harvest Database

2009 Committee Assignments

- Anyone who gave a report or presentation to provide Scholten with a summary before February 1, 2009
- Discuss egg check study-conference call or e-mail
- Committee to develop a stocking protocols document before 2009 stockings occur. Scholten will set up conference call for all of those who are interested. At a minimum we will need a representative from each sub-basin and from all agencies that stock paddlefish.
- Scholten to request approval of 2008 minutes by e-mail (**Approved 02-03-09**)
- Next year's meeting will be held on January 20-21, 2010 (Wednesday-Thursday). Tentative location: St. Charles, Missouri
- Elkington to email the tables that he drafted for Commercial Roe Fish Harvest Database to Scholten so they can be reviewed by commercial harvest states. After this review Scholten will work with each state to develop a list of changes that they would have to make so all states could provide standardized data for this database. Dan Burleson to investigate housing options for the database and look into legality issues. If anyone identifies funding or housing options for database, please contact Scholten or Elkington.

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Shovelnose Sturgeon Commercial Harvest

Data Compiled for MICRA 10-20-08

State of Arkansas total shovelnose harvest (Primarily White River; small amount from Arkansas and Black rivers)			
Year	Flesh (lbs)	# of fish	Roe (lbs)
1995	.	.	.
1996	.	.	.
1997	.	.	.
1998	.	.	.
1999	.	.	.
2000	.	.	.
2001	73	72	203
2002	250	247	44
2003	1,806	1,781	391
2004	2,140	2,110	660
2005	3,767	3,715	855
2006	1,520	1,499	346
2007	1,522	1,501	331

State of Missouri total shovelnose harvest (Mississippi & Missouri River)		
Year	Flesh (lbs)	Roe (lbs)
1995	6,201	.
1996	10,142	.
1997	8,231	.
1998	9,089	.
1999	19,655	.
2000	23,394	.
2001	77,498	.
2002	43,211	.
2003	23,956	4,365
2004	28,818	3,504
2005	10,002	2,356
2006		
2007		

State of Iowa total shovelnose harvest (Mississippi River)		
Year	Flesh (lbs)	Roe (lbs)
1995	17,899	.
1996	18,043	.
1997	15,113	.
1998	19,919	.
1999	14,016	.
2000	28,676	.
2001	26,168	.
2002	28,203	235
2003	35,266	2,019
2004	35,450	3,152
2005	24,162	3,580
2006	26,005	3,105
2007	8,674	955

State of Illinois total shovelnose harvest (Mississippi River)		
Year	Flesh (lbs)	Roe (lbs)
1995	20,685	125
1996	17,290	99
1997	20,874	182
1998	25,410	552
1999	37,458	1,446
2000	31,963	2,883
2001	49,079	5,266
2002	42,835	5,930
2003	63,162	6,485
2004	50,949	6,730
2005	85,145	8,395
2006		
2007		

State of Tennessee total shovelnose harvest (Mississippi River)			
Year	Flesh (lbs)	# of fish	Roe (lbs)
1995	.	.	.
1996	.	.	.
1997	.	.	.
1998	.	.	.
1999	.	.	.
2000	4,178	1,494	.
2001	2,178	674	.
2002	3,519	1,222	660
2003	5,759	1,988	1,001
2004	4,005	1,410	665
2005	17,297	5,345	2,290
2006	12,926	4,019	2,027
2007	7,812	2,418	1,366

State of Kentucky total shovelnose harvest (primarily Mississippi & Ohio rivers)		
Year	Flesh (lbs)	Roe (lbs)
1995	.	.
1996	.	.
1997	.	.
1998	.	.
1999	1,097	101
2000	13,612	814
2001	18,497	1,521
2002	13,887	1,041
2003	4,208	352
2004	13,172	907
2005	20,289	2,207
2006	15,337	1,784
2007	16,699	2,183

State of Wisconsin total shovelnose harvest (Mississippi River)		
Year	Flesh (lbs)	Roe (lbs)
1995	.	.
1996	.	.
1997	.	.
1998	.	.
1999	.	.
2000	.	.
2001	6,327	51
2002	4,195	271
2003	5,824	137
2004	2,167	198
2005	2,890	74
2006	3,988	79
2007	3,221	246

State of Indiana total shovelnose harvest (primarily Wabash and White rivers)		
Year	Flesh (lbs)	Roe (lbs)
1995	0	.
1996	0	.
1997	0	.
1998	53	.
1999	1,626	.
2000	451	.
2001	2,582	.
2002	1,729	.
2003	987	.
2004	1,059	.
2005	181	.
2006	263	.
2007	1,899	.

MICRA Paddlefish Database Advancements and Updates

Keeping up with sampling efforts, paddlefish recaptures and hatchery releases from 22 states can be daunting, but Columbia National Fish and Wildlife Conservation Office (NFWCO) is up to the challenge. After many hours of extracting and reading coded wire tags, entering data, proofing data and much more, the database is up to date. The updated database was copied onto CD's and will be distributed at the January 2009 meeting. The database contained all data received by Columbia NFWCO through November 24th 2008 and a new paddlefish recapture entry form. We are also training a new technician, Mark Corio, in the art of coded wire tag extraction, reading and data entry. Lastly, we have begun planning for the MICRA Paddlefish Commercial Harvest database.

Sara Marso, Aaron Walker and Brian Elkington, under the supervision of Joanne Grady, extracted, entered and proofed numerous strings of data into the database. Since November 2007 we have added 1,652 wild tagged and released adult paddlefish as well as 704 recaptures (Table 1). The database includes data for 35,204 tagged and released wild paddlefish and 4,771 tag recapture events. Also, over the course of this project, there have been almost 2.1 million hatchery reared coded wire tagged paddlefish released into America's waterways.

Connecting the data collected from recaptured paddlefish with release information is the purpose of this database. The resulting strings of data can provide, among other metrics, information about fish growth and movement. Currently, the database includes 3,867 paddlefish recaptures that can be connected to release information, 3,512 CWT recaps and 355 jawtag recaps (Table 2). Of CWT recaptures, 58% were hatchery origin and 42% were wild origin. Due to the nature of jawtags in this project, 100% of the recaptures are considered to be of wild origin (Table 2).

CWT hatchery origin fish have been recaptured the same year (n=5) to 17 years (n=13) after their release. However, the average time at large before being recaptured is 7 years (Table 3). On average, hatchery origin paddlefish caught 7 years since their release have grown 552 mm (21.7 in) to reach an eye-fork length of 865 mm (34.1 in) and weigh 9.9 kg (21.8 lbs) (Table 4).

CWT wild origin fish have been recaptured the same year (n=213) to 12 years (n=1) after their release. However, the average time at large before being recaptured is 3 years (Table 3). On average, wild origin fish caught 3 years since their release have grown 67 mm (2.6 in) and 1.6 kg (3.4 lb) (Table 4).

Jawtagged fish have been recaptured the same year (n=156) to 8 years (n=1) after their release. However, the average time at large before being recaptured is 1 year (Table 5). On average, wild origin fish caught 1 year after their release have grown 35 mm (1.4 in) and 0.5 kg (1.0 lb) (Table 6).

Most of the paddlefish that have been released for this project have been recaptured within the same river basin (Table 7). Only 32 CWT and 1 jawtag recapture, of the 3,867 reported recaptured fish, has occurred outside its respective release basin, all of which took place prior to 2007. Two paddlefish were released in proximity to John T. Myers Lock and Dam on the Ohio River and recaptured just downstream of Gavin's Point Dam on the Missouri River (Table 8). These fish traveled a minimum of 1,136 miles to reach their recapture point.

Recaptures were most prevalent in the Missouri River due to returns from the joint NE/SD archery and snagging fisheries; 1,268 recaptures have occurred, 1,196 of which can be connected to release data; 851 of those are from releases prior to 1996. Although rostrums have been received from the 2008 harvest season, they have not yet been entered into the database.

In 2006 the participating states agreed to begin tagging wild caught fish with jawtags as opposed to CWT's. We expect to see fewer CWT returns of fish from 2006 forward as only hatchery reared fish will bear CWT's. Although the database has been modified to accept jawtag numbers in the data tables, it was not designed to link fish tagged with a CWT to fish subsequently re-tagged with a jawtag. The database will need further modification before this link can be made and developed into a user friendly process. Additionally, the states agreed to enter their own field data with templates provided by us. We have received data from some of the states in this form and would expect the use of this method to increase in the coming year.

We have been continually working on ways to make tag extraction and data entry an efficient and error free process. The tag cleaning protocol that was created in 2007 has become an essential tool in the extraction process, ensuring accurate decoding of CWT's. It has also allowed us to successfully re-read and correct some historic tag errors in the database. We have also been fielding questions from state agencies regarding data entry templates used for their collection data, tag code use by various states, and paddlefish datasheet issues.

In an attempt to make the database more user friendly, this year we added a "Main Menu". When the database is opened, the main menu will pop-up and give the user three automatic functions to choose from. The first is the form that connects CWT recaptures to CWT releases, the second is a jawtag recapture history that relates all jawtag recaptures to their release, the third closes the main menu allowing you to navigate the database tables and queries as you have in the past. You can always re-open the main menu by opening the form "MAIN MENU". In the future we hope to include a function that connects release and recapture data across both tag types. We want this menu to be as user-friendly as possible, if you have suggestions or comments about the menu or other functions you would like to see available there, please let me know.

In the past year we have also met with Dan Burleson and talked with George Scholten to begin plans for the MICRA Paddlefish Commercial Harvest database. We have received data as well as outlines of goals for this database. We are working to build an efficient means for entering, storing and accessing commercial harvest data.

As we continue to receive and work through the incoming paddlefish data please feel free to let us know about deadlines you may be working under. Although we handle the paddlefish data our office receives on a first come first serve basis, we do our best to have quick turn around time.

This project is a great opportunity to work together and gather population level data from across the country on a large riverine fish species. We look forward to our continued work with MICRA on the Paddlefish Stock Assessment Project and future efforts to create the commercial harvest database.

Brian Elkington

Table 1. Summary data, by state, added to the database since November 2007 and their new respective totals.

Basin	State	Wild CWT Releases	CWT Recaptures	Wild Jawtag Releases	Jawtag Recaptures	Hatchery CWT Released Paddlefish	Total Hatchery Released Paddlefish
<u>Missouri</u> <u>Basin</u>	IA : Added	0	0	0	0	0	0
	Updated Total	306	19	0	1	0	0
	KS : Added	0	0	0	0	0	0
	Updated Total	63	23	0	0	12,117	12,117
	MO : Added	1	69	2	0	64,972	64,972
	Updated Total	199	239	2	0	408,069	408,069
	ND : Added	0	0	0	0	0	0
	Updated Total	0	0	0	0	19,037	19,037
	NE : Added	0	59	755	19	0	0
	Updated Total	3,513	679	755	43	0	0
	SD : Added	0	269	259	2	0	0
	Updated Total	2,704	1,701	267	17	306,555	435,936
	Basin : Added	1	397	1,016	21	64,972	64,972
	Basin Total	6,785	2,661	1,024	61	745,778	875,159
<u>Mississippi</u> <u>Basin</u>	AR : Added	0	0	0	0	0	0
	Updated Total	31	20	0	0	17,388	17,388
	IA : Added	0	0	0	0	0	0
	Updated Total	2,629	129	0	5	0	0
	IL : Added	0	0	0	0	0	0
	Updated Total	2,551	136	0	0	0	0
	KS : Added	0	0	0	0	3,000	3,000
	Updated Total	0	1	0	0	30,299	30,299
	LA : Added	0	0	0	0	0	0
	Updated Total	11	0	11	2	18,146	18,146
	MN : Added	0	0	0	0	0	0
	Updated Total	35	0	20	3	0	0
	MO : Added	0	35	0	0	0	0
	Updated Total	44	300	0	0	47,696	47,696
	MS : Added	0	0	0	0	0	0
	Updated Total	120	0	0	0	0	0
	OK : Added	1	23	211	13	7,324	7,324
	Updated Total	81	235	5,251	87	45,635	45,635
	TN : Added	0	0	0	0	0	0
	Updated Total	218	0	0	0	5,388	5,388
	WI : Added	0	0	0	2	0	0
	Updated Total	394	0	361	117	0	0
	Basin : Added	1	58	211	15	10,324	10,324
	Basin Total	6,114	821	5,643	214	164,552	164,552

Basin	State	Wild CWT Releases	CWT Recaptures	Wild Jawtag Releases	Jawtag Recaptures	Hatchery CWT Released Paddlefish	Total Hatchery Released Paddlefish
<u>Ohio Basin</u>	IL : Added	0	1	0	4	0	0
	Updated Total	2,893	90	2,389	80	0	0
	IN : Added	0	0	0	0	0	0
	Updated Total	2,414	200	679	12	0	0
	KY : Added	0	0	0	2	0	0
	Updated Total	2,577	139	1,660	27	1,800	1,800
	NY : Added	0	0	0	0	0	0
	Updated Total	0	8	0	0	3,897	6,911
	OH : Added	0	5	78	10	0	0
	Updated Total	489	61	307	13	0	0
	PA : Added	0	0	0	0	2,711	2,711
	Updated Total	1	8	0	0	76,341	89,172
	TN : Added	0	2	0	0	1,326	1,326
	Updated Total	187	15	0	0	7,594	7,924
	WV : Added	0	0	0	0	140	140
	Updated Total	54	5	5	0	27,062	32,601
Basin : Added	0	8	78	16	4,177	4,177	
Basin Total	8,615	526	5,040	132	116,694	138,408	
<u>Gulf Basin</u>	LA : Added	0	5	3	0	0	0
	Updated Total	670	20	462	16	168,720	168,720
	OK : Added	0	171	342	13	12,849	12,849
	Updated Total	3	253	821	60	119,520	119,520
	TX : Added	0	0	0	0	0	0
	Updated Total	27	7	0	0	771,135	771,135
	Basin : Added	0	176	345	13	12,849	12,849
Basin Total	700	280	1,283	76	1,059,375	1,059,375	
<u>Entire Database</u>	Total Added	2	639	1,650	65	92,322	92,322
	Database Total	22,214	4,288	12,990	483	2,086,399	2,237,494

Table 2. Number of CWT recaptures that can be related to release information; their respective origin type and frequency of recapture events. N/A indicates that no jawtagged paddlefish have been recaptured more than three times.

	Caught Once	Caught Twice	Caught Three Times	Caught Four Times
All CWT Recaptures	3512	98	3	1
Hatchery Origin	2027	48	1	1
Wild Origin	1485	50	2	0
Jawtag Recaptures	355	26	2	N/A

Table 3. Summary of growth and temporal data for both hatchery and wild origin CWT recaptures.

	Hatchery Origin	Wild Origin
Minimum Years at large until Recapture	0	0
Maximum Years at large until Recapture	17	12
Mean Years at Large until Recapture	7	3
Mean Length at Release (mm, in)	335 (13.1)	785 (30.9)
Mean Length at Recapture (mm, in)	852 (33.5)	814 (32)
Mean Weight at Release (kg, lb)	No Data	7 (15.4)
Mean Weight at Recapture (kg, lb)	11 (24.2)	8 (17.6)
Mean growth (mm, in)	534 (21)	55 (2.2)
Mean growth (kg, lb)	No Data	1 (2.2)

Table 4. Length, weight and growth summary data for CWT paddlefish recaptured by the number of years after release. (--) indicates no length or weight data was present.

Hatchery Origin				Wild Origin						
Years at Large	Mean Growth mm (in)		Mean Length mm (in)		Mean Weight kg (lb)		Mean Growth mm (in)		Mean Growth kg (lb)	
0	--	--	--	--	--	--	12 (.5)	-0.4 (-0.9)		
1	313	(12.3)	673	(26.5)	6.4	(14.1)	39 (1.5)	0.7 (1.6)		
2	351	(13.8)	729	(28.7)	8.4	(18.5)	36 (1.4)	1.0 (2.2)		
3	509	(20)	802	(31.6)	10.2	(22.5)	67 (2.6)	1.6 (3.4)		
4	515	(20.3)	838	(33.)	12.5	(27.4)	84 (3.3)	2.5 (5.6)		
5	553	(21.8)	851	(33.5)	12.6	(27.8)	86 (3.4)	3.0 (6.5)		
6	562	(22.1)	833	(32.8)	10.8	(23.7)	33 (1.3)	1.7 (3.6)		
7	552	(21.7)	865	(34.)	9.9	(21.8)	66 (2.6)	3.8 (8.3)		
8	609	(24)	929	(36.6)	12.5	(27.4)	93 (3.7)	3.2 (7)		
9	545	(21.4)	900	(35.4)	9.7	(21.3)	94 (3.7)	1.1 (2.5)		
≥10	674	(26.5)	990	(39)	15.0	(33.)	58 (2.3)	2.4 (5.3)		

Table 5. Summary of growth and temporal data for jawtagged paddlefish recaptures.

Minimum Years at large until Recapture	0
Maximum Years at large until Recapture	8
Mean Years at Large until Recapture	1
Mean Length at Release (mm, in)	851 (33.5)
Mean Length at Recapture (mm, in)	835 (32.8)
Mean Weight at Release (kg, lb)	10.4 (22)
Mean Weight at Recapture (kg, lb)	10.2 (22)
Mean growth (mm, in)	42 (1.7)
Mean growth (kg, lb)	1 (2.2)

Table 6. Growth summary data for jawtagged fish recaptured by the number of years after release.

Jawtagged Paddlefish			
Years at Large	Mean Growth		Mean Growth
	mm	(in)	kg (lb)
0	16	(0.6)	0.6 (1.3)
1	35	(1.4)	0.5 (1.0)
2	56	(2.2)	1.8 (3.9)
3	70	(2.8)	2.7 (5.9)
4	93	(3.7)	6.9 (15.2)
≥5	86	(3.4)	4.7 (10.3)

Table 8. 2005-2007 Coded wire tagged paddlefish that were released and recaptured within the same river basin.

Missouri Basin																				
Recap Year	Released Year																			Year Total
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	
2008 [†]	*	*	*	1				1	4	39	9	13	14	29	9	3	2	2		126
2007		*	*		8	11	7	5	6	15	5	3	6	7	8	18	2	10	11	122
2006			*	5	12	14	5	10	5	7	13	5	14	11	5	14	2	6	13	141
2005				2	12	14	5	3	8	9	9	8	7	16	6	8	4	7	17	135
Basin Total:																			398	
Mississippi Basin																				
Recap Year	Released Year																			Year Total
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	
2008 [†]	*	*	*								1			3						4
2007		*	*						1	3	4	5	8		1					22
2006			*	7	10	2	1	4	11	2	68		32							137
2005				4	15	3	2	3	1	3	27	4	16							78
Basin Total:																			237	
Ohio Basin																				
Recap Year	Released Year																			Year Total
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	
2008 [†]	*	*	*									2		2						4
2007		*	*							4		1								5
2006			*	1		2	1	7	2	4	4	2	4							27
2005				4	7	5	4	6	8	9	8	9		4						64
Basin Total:																			96	
Gulf Basin																				
Recap Year	Released Year																			Year Total
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	
2008	*	*	50	5	21	5	2													83
2007		*	6	1	7	1	1		1											17
2006			*	1	13	5	7	2		5		1								34
2005					22	3	12	1	4	5										47
Basin Total:																			98	

[†] Fewer sampling events have been reported to date for 2008 than previous.

* Blank spaces are due to the 2006 decision to stop marking adult wild fish with CWT's. It takes an average of seven years for hatchery reared CWT'ed paddlefish to recruit to the population.

Table 7. 2005 and 2006 paddlefish that were recaptured outside the river basin in which they were released. There are an additional 26 CWT recaps prior to 2005 and 1 jawtag recapture in 2002 that occurred outside the river basin in which they were released.

2006										
Release Type	Recap Type	Release State	Release Basin	Release River	Release Site	Recap Basin	Recap River	Recap Site	Release Date	Recap Date
W	W	IL	Mississippi	Mississippi	Melvin Price Dam	Missouri	Missouri	Gavin's Point Dam	1/25/2002	10/20/2006
W	W	SD	Missouri	Missouri	Gavin's Point Dam Tailwater	Ohio	Ohio	Smithland Tailwater	6/17/1998	1/12/2006
W	W	IN	Ohio	Ohio	John T. Myers Dam	Missouri	Missouri	Gavin's Point Dam Tailwater	5/26/1998	2006
2005										
Release Type	Recap Type	Release State	Release Basin	Release River	Release Site	Recap Basin	Recap River	Recap Site	Release Date	Recap Date
W	W	IL	Ohio	Ohio	John T. Myers Dam	Missouri	Missouri	Gavin's Point Dam	4/15/2002	10/13/2005
W	W	IL	Mississippi	Mississippi	Melvin Price Dam	Missouri	Missouri	Gavin's Point Dam	1/27/2000	10/13/2005
W	W	IL	Mississippi	Mississippi	Melvin Price Dam	Ohio	Ohio	Smithland Tailwater	2/6/2004	4/6/2005

Paddlefish Management, Propagation, and Conservation in the 21st Century: Building From 20 Years of Research and Management

Craig Paukert and George Scholten, editors
Status of Chapters
January 16, 2009

Part 1. Distribution, ecology, and life history

1. Biology and life history of paddlefish: an update *Cecil Jennings and Steve Zigler*
Status: Waiting for authors' revision (should be in within a few days) (Paukert)
2. Status, distribution and abundance of paddlefish in the US *George Scholten, Janice Kerns, and Phil Bettoli*
Status: Accepted (Paukert)
3. Paddlefish ecology in the Alabama River drainage *Dennis DeVries*
Status: Accepted (Paukert)
4. Feeding ecology of paddlefish in the Mermentau River, LA *Nicole Smith, Richard Condrey, and Bobby Reed*
Status: Accepted (Paukert)
5. Paddlefish movements in the Mobile River Basin of Alabama *Maurice (Scott) Mettee, Patrick O'Neil, and Steve Rider*
Status: Accepted (Scholten)
6. Population characteristics of paddlefish in two Tennessee-Tombigbee Waterway habitats. *Dan M. O'Keefe and Don C. C. Jackson*
Status: Accepted (Scholten)
7. Spawning migrations and reproductive dynamics of paddlefish in the Upper Missouri River Basin *Pat Braaten, Dave Fuller, and Ryan Lott*
Status: Accepted (Paukert)
8. Survival, movement, reproduction, and habitats used by paddlefish in the Arkansas River, Arkansas. *Steve Donabauer, Joe Stoeckel, and Jeff Quinn.*
Status: Accepted (Scholten)
9. Swimming Performance of Juvenile Paddlefish: Quantifying Risk of Entrainment. *Jan Hoover, April Turnage, and K. Jack Kilgore.*
Status: Waiting for author's minor revisions (Paukert)
10. Morphological variation in juvenile paddlefish. *Jan Hoover and Steven St. George.*
Status: Waiting for author's minor revisions (Paukert)

Part 2. Threats to paddlefish

11. Habitat-related threats to paddlefish. *Joe Gerken and Craig Paukert*
Status: Not yet received; in USGS policy review (Paukert)
12. Potential effects of invasive species on paddlefish *Mark Pegg, John Chick, and Brenda Pracheil*
Status: Accepted (Paukert)
13. Harvest of paddlefish in North America. *Jeff Quinn*
Status: Accepted (Scholten)

14. Paddlefish harvest in Oklahoma *Brent Gordon*
Status: Waiting for author's minor revision (Paukert)
15. Joint management of an interjurisdictional paddlefish snag fishery in the Missouri River below Gavins Point Dam, South Dakota and Nebraska. *Gerald Mestl and Jason Sorensen*
Status: Accepted (Scholten)
16. Management of the Arkansas River commercial paddlefish fishery with check stations and special seasons *Jeff Quinn, William Posey, Frank Leone, and Robert Limbird*
Status: Accepted (Paukert)

Part 3. Paddlefish conservation and management

17. Current management of paddlefish sport fisheries *Kirk Hansen and Craig Paukert*
Status: Waiting for author revision (Scholten)
18. Management of commercial paddlefish fisheries in the US *George Scholten*
Status: Waiting for author revision (Paukert)
19. Paddlefish genetics, conservation, and inbreeding *Brian Sloss, Robert Klumb, and Ed Heist*
Status: Waiting for author revision (Scholten)
20. Mortality and movements of paddlefish released as bycatch in a commercial fishery in Kentucky Lake, Tennessee. *Janice Kerns, Phil Bettoli, and George Scholten*
Status: Accepted (Paukert)
21. Commercial Harvest of Paddlefish in the Upper Mississippi River *Mike Quist, Mike Steuck, and Michelle Morron*
Status: Accepted (Scholten)

Part 4. Paddlefish stocking and culture

22. Propagation and culture techniques for paddlefish. *Steve Mims, Richard Onders, and William Shelton*
Status: Accepted (Paukert)
23. Maintaining paddlefish by stocking. *Joanne Grady and Brian Elkington*
Status: Not yet received (Scholten)
24. Restoration of paddlefish to the Upper Allegheny River, New York *David Argent, William Kimmel, Rick Lorson, Paul McKeown, Douglas Carlson, and Michael Clancy*
Status: Accepted (Scholten)
25. Factors associated with age-0 paddlefish production in rearing ponds *Steve Chipps, H. Denise Symens, and Herb Bollig*
Status: Accepted (Paukert)

Part 5. Future directions

26. Summary of where we are today in paddlefish conservation and management; future research needs *Craig Paukert and George Scholten*
Status: Will be written after all chapters are in

Contributions for Publication of Paddlefish Book

Contributor	Pledged Amount	Amount AFS Received
Nebraska AFS Chapter	\$500	\$500
Dakota AFS Chapter	\$500	\$500
Arkansas Game and Fish Commission	\$1,000	\$1,037.50
Arkansas AFS Chapter	\$350	
Pennsylvania AFS Chapter	\$500	
Indiana AFS Chapter	\$500	
U.S. Army Engineer Research and Development Center	\$1,000	
USFWS - Region 4	\$2,000	
North American Native Fishes Association	\$500	\$500
USFWS - Regions 2, 3, & 6	\$3,000	
USFWS - Division of Scientific Authority	\$1,000	
UMRCC	\$2,000	\$2,000
SD Game, Fish, and Parks	\$500	\$500
New York AFS Chapter	\$500	
MICRA	\$2,500	
TOTAL	\$16,350	\$5,038
AMOUNT NEEDED FOR GOAL	\$8,650	\$19,963
PERCENT CONTRIBUTED TOWARDS GOAL	65%	20%