2007
FISH CULTURE SECTION
ANNUAL REPORT

FISHERIES BUREAU

CONSERVATION & RECREATION DIVISION

PERIOD COVERED: JANUARY 1, 2007 – DECEMBER 31, 2007

IOWA DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

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COVER: Over 12 ½" of rain fell overnight on August 23rd in the hatchery vicinity resulting in flooding of the Chariton River behind the hatchery and inundation of the sewage lagoons and pollution ponds.

2007 FISH CULTURE SECTION COMPLETION REPORT

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FISH CULTURE SECTION

INTRODUCTION

The Fish Culture Section is responsible for the production, acquisition and distribution of a variety of fish species requested by Management and Research Sections of the Fisheries Bureau.

The Fish Culture Section maintains three cold water and three cool/warm water hatcheries, staffed by 26 full-time employees and numerous temporary fisheries aides.

Management and Research Section personnel actively participate in acquiring walleye brood stock and eggs at temporary facilities located at Clear Lake, Storm Lake, as well as assisting at the Rathbun and Spirit Lake Hatcheries. The Guttenberg Management Station acquires and hatches northern pike eggs. Mount Ayr Management Station personnel maintain a pond hatchery producing a variety of fish species.

Table 1. *2007 Fish Production and Costs.*

COLD WATER SPECIES	Number	Weight (Lb)	Total Cost	Cost per Fish	Cost per Lb
Brook Trout (4.8”)	114,873	5,267	$22,166	$0.193	$4.21
Brook Trout (catchable)	33,032	18,319	$58,225	$1.763	$3.18
Brown Trout (2.2”)	163,934	720	$2,297	$0.014	$3.19
Brown Trout (7.4”)	9,800	1,600	$3,472	$0.354	$2.17
Rainbow Trout (3.5”)	331,700	5,603	$17,874	$0.054	$3.19
Rainbow Trout (catchable)	331,250	167,991	$530,588	$1.602	$3.16
WARM/COOL WATER SPECIES	**Number**	**Weight (Lb)**	**Total Cost**	**Cost per Fish**	**Cost per Lb**
Bluegill (1”)	1,467,135	785	$13,345	$0.009	$17.00
Bluegill (1.5”/spring)	270,472		$2,690	$0.010	
Channel Catfish (2”-4”)	589,378	7,033	$22,241	$0.038	$3.16
Channel Catfish (4.5”-9”)	225,140	24,034	$153,925	$0.684	$6.40
Channel Catfish (10”)	4,117	1,400	$10,924	$2.653	$7.80
Goldfish (forage)		1,470	$928		$0.63
Koi (forage)		93	$488		$5.24
Largemouth Bass (1.5”)	384,052	582	$23,510	$0.061	$40.41
Largemouth Bass(4”/spring ext.)	12,730	424	$2,150	$0.169	$5.07
Largemouth Bass (5”/extensive)	3,302	64	$1,860	$0.563	$29.29
Muskellunge (fry)	894,230		$19,401	$0.022	
Muskellunge (1”-2”)	120,056	39	$4,851	$0.040	$123.12
Muskellunge (4”)	12,333	122	$4,138	$0.336	$33.85
Muskellunge (11”)	8,242	1,631	$29,174	$3.540	$17.89
Muskellunge (14”/spring)	3,407	1,363	$24,826	$7.287	$18.22
Northern Pike (fry)	483,151		$9,299	$0.019	
Northern Pike (3” /intensive)	31,396	91	$20,239	$0.645	$223.49
Walleye (fry)	88,804,000		$171,169	$0.002	
Walleye (2”/MS strain)	397,765	356	$13,730	$0.035	$37.55
Walleye (2”)	1,107,991	2,747	$24,400	$0.022	$8.88
Walleye (2.8” /intensive)	70,888	472	$8,986	$0.127	$19.04
Walleye (6”)	156,799	7,112	$63,098	$0.402	$8.87
Walleye (7.3” /intensive)	17,038	1,697	$21,134	$1.240	$12.45
Walleye (10” /intensive)	192,347	57,699	$182,865	$0.951	$3.17
White Amur (8”)	116	39	$347	$2.99	$8.96
Wipers/Palmetto Bass (fry)	1,500,000		$3,222	$0.002	
Wipers/Palmetto Bass (2”)	12,475	38	$3,075	$0.246	$80.11

FISH PRODUCTION & COSTS

Fish production costs for 2007 are compiled in Table 1. The total numbers, weights and costs shown are not necessarily reflective of fish stocked into Iowa waters. These figures may include fish that were produced or inventoried during different rearing phases or fish traded to others. These different sizes of fish and their production costs are made available to the American Fisheries Society to assist in the development of the replacement cost of fish. A complete list of the 2007 fish stockings can be found at the end of this report in Table 67.

The cost represents the combined production costs as reported by individual hatcheries and therefore not necessarily representative of any one hatchery. The costs include all expenditures related to production and distribution of fish. This includes labor, chemicals, fertilizers, feed, and station and equipment maintenance relating to fish culture, transportation and vehicle expense (depreciation, overhead, insurance, and maintenance). Not included are depreciation of the station, capital improvements, or those expenditures more closely related to maintaining a district office or public relations.

FISH TRADES

Table 2 lists the fish trade that Iowa negotiates which usually involves trading species we have in abundance for those we want to release in Iowa. Some of the trades are established in advance of the fish production season. Others are a result of surpluses due to over production at different fish life stages.

Table 2. *2007 Fish Trades.*

Species	Number	Received From
Black Crappie (2.7")	3,000	U.S. Fish & Wildlife Service/Genoa NFH
Brook Trout (eggs/St Croix)	32,000	Wisconsin Department of Natural Resources
Brook Trout (eggs/Coaster)	45,000	U.S. Fish & Wildlife Service/Iron River NFH
Brook Trout (9")	900	U.S. Fish & Wildlife Service/Genoa NFH
Channel Catfish (fry)	369,267	Missouri Department of Conservation
Channel Catfish (7")	29,146	Missouri Department of Conservation
Koi (fry)	50,000	Texas Parks & Wildlife Department
Northern Pike (eggs)	912,000	U.S. Fish & Wildlife Service/Garrison Dam NFH
Northern Pike (4.7")	25,536	Illinois Department of Natural Resources
Palmetto Bass/Wipers (fry)	1,500,000	Oklahoma Division of Wildlife Conservation
Rainbow Trout (11")	1,010	U.S. Fish & Wildlife Service/Genoa NFH
Walleye (eggs/MS River)	1,250,000	U.S. Fish & Wildlife Service/Genoa NFH
Walleye (1.6"/MS River)	179,000	U.S. Fish & Wildlife Service/Genoa NFH
White Amur (fry)	5,000	Arkansas Game & Fish Commission
Yellow Perch (3.5")	21,613	U.S. Fish & Wildlife Service/Genoa NFH
Species	**Number**	**Shipped To**
Muskellunge (eggs)	561,000	Virginia Department of Game &Inland Fisheries
Muskellunge (fry)	31,838	Minnesota Musky Farm
Muskellunge (1.2")	75,232	Michigan Department of Natural Resources
Muskellunge (1.5")	39,466	Illinois Department of Natural Resources
Muskellunge (4")	4,678	Nebraska Game & Parks Commission
Muskellunge (4")	7,655	Missouri Department of Conservation
Walleye (eggs)	1,000,000	Oklahoma Division of Wildlife Conservation

WORK TIME EXPENDITURES

Table 3 and Figure 1 details how hatchery employees spent their time during 2007. As expected, fish culture was the most time consuming activity, followed by maintenance and then leave. Although each biologist is deputized to enforce fish and game laws for a six-month period, this activity doesn't add much time to their workload.

PUBLIC RELATIONS AND AQUATIC EDUCATION

During 2007 hatchery personnel provided 194 hatchery tours to 12,355 people, 12 radio/television interviews, 32 newspaper articles and/or interviews, 35 personal presentations, 2 sport shows, 2 job shadows and assisted with 8 fishing clinics. Several employees assisted at the Iowa State Fair aquarium display.

OTHER ACTIVITIES

All section employees who work with fisheries chemicals are certified as aquatic pesticide applicators and received required training in 2007.

John Richmond is a Board member of the Lamont Kids Center, Inc., the Lamont Cemetery, the Lamont Community Center, and a certified DNR Hunter Safety Instructor.

Gary Siegwarth serves as the Clayton County Pheasants Forever Habitat Chairman and as the Clayton County Farm Bureau Environmental Resources Coordinator. Gary presented numerous stream table demonstrations to area schools, colleges and teachers workshops and presented at the annual Streams & Watershed Integrated Management (SWIM) Workshop.

Gary chairs the Iowa Chapter AFS Nominations Committee and served on the AFS North Central Division's Rivers and Streams Technical Committee. Gary also served on both the DNR's groundwater and streams & rivers task force committees. He writes numerous articles for local newspapers as well as providing accurate information to publications such as the Farm Bureau Spokesman. Gary also helps with coaching youth, Jr. High, and high school activities at the local school.

Chris Larson is a volunteer instructor with the Iowa Hunter Education Association.

Chris Clouse serves on the Steering Committee for the Indian Hills Community College Sustainable Agriculture Program. Chris is a member of the Moravia School District Citizens Advisory Council.

Donna Muhm is Secretary and Chair of the AFS NCD Walleye Technical Committee. She is chair of the Temporary Fisheries Employee Finding Committee that hires summer employees statewide. Donna graduated from the Certified Public Manager Program for Iowa.

Shawn Peterson is involved in Special Youth Challenge Ministries and assists in taking handicapped students hunting for deer and/or wild turkey.

Table 3. *Employee-hours expended during 2007.*		
Activity	Employee-Hours	% of Total
Fish Culture	24,933.8	37.42
Equipment, Buildings and Grounds Maintenance	16,017.5	24.04
Leave	6,454.3	9.69
Fish Distribution	4,976.5	7.47
Administration	5,727.5	8.60
Clerical	2,245.0	3.37
In-Service Training and Meetings	1,923.5	2.89
Aquatic Education	17,34.75	2.60
Assisting Others	1,232.0	1.85
Public Relations	1,349.0	2.02
Law Enforcement	41.0	0.06
TOTAL	66,634.75	100.0

Bob Benedict and Kim Hawkins teach an annual class to the Hull Western Christian High School Envirothon Team.

Kim Hawkins is on the Clay County Fair Planning Committee.

Mike Mason, Donna Muhm, Brian Malaise, Dave Marolf, Gary Siegwarth, Wayne Wingert attended the 2007 meeting of the Kansas, Nebraska and Iowa Chapters of the American Fisheries Society (AFS) in Council Bluffs, Iowa. Kim Hawkins is Chair of the Best Paper Award Committee, Iowa Chapter AFS.

In January, Chris Clouse and Donna Muhm presented at the 2007 Coolwater Fish Culture Workshop held at the new Hackettstown Hatchery in New Jersey. Donna's talk was entitled "Intensive Walleye Culture at the Spirit Lake Hatchery – Are We Making Progress or Re-inventing the Wheel?" Chris's talk was "Procedures for Raising Large Walleye Fingerlings at Rathbun Fish Hatchery." The Rathbun Research team also presented talks. Alan Johnson gave

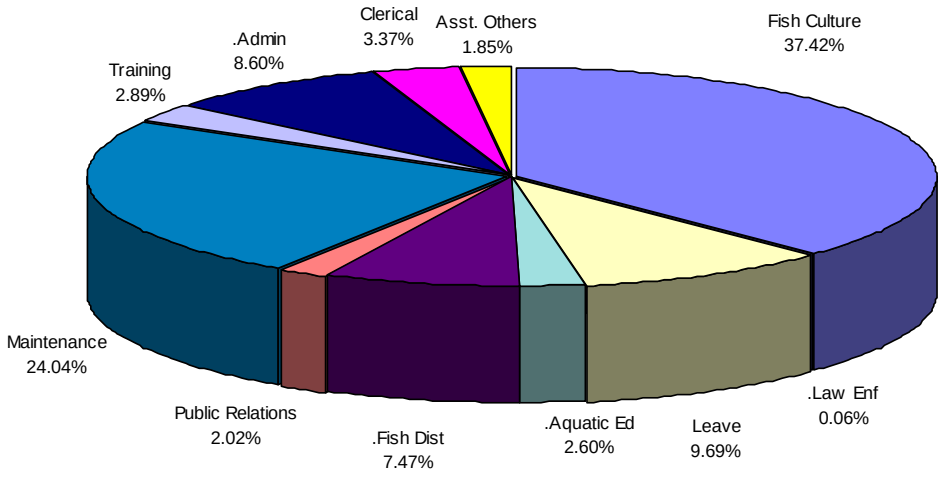

Figure 1. Hatchery section employee hours as percent of total work time.

"Update on Walleye Diet and Disease Research" as well as a presentation on Drug Research and the need for more hatcheries to get involved in fish drug studies. Jay Rudacille presented "The Use of Imhoff Cones to Rapidly Quantify Zooplankton Populations in Aquaculture Ponds." Mike Mason was part of the "VHS & Transport Implications" panel discussion and also serves on the Coolwater Workshop Steering Committee.

Bob Benedict, Chris Clouse, Kim Hawkins, Melanie Harkness, Mike Mason, Donna Muhm, Shawn Peterson, Jay Rudacille and Ken Snyder attended the 2007 Mid-Continent Fish Culture Workshop held in Kansas City, Kansas in February. Donna and Jay presented the same talks they gave at the Coolwater Workshop. Mike Mason serves on the Midcontinent Workshop Steering Committee and Iowa hosts the workshop in 2009.

In October, Brian Malaise attended the 2nd Annual Midwest Driftless Fall Symposium in Decorah.

Mike Mason served on the DNR's 2007 Iowa Excellence Self-Assessment Team. Mike chaired the 2007 North American Journal of Aquaculture Best Paper Award Subcommittee for the American Fisheries Society.

Mike and Alan Johnson attended the 13th Annual Drug Approval Coordination Workshop and the Aquaculture Drug Research Forum held the end of July in Bozeman, Montana. Mike serves on the Association of Fish and Wildlife Agencies (AFWA) Drug Approval Working Group (DAWG). Mike attended the March DAWG meeting in Portland, Oregon and the September DAWG meeting in Louisville, Kentucky.

Donna Muhm attended and assumed the chair of the AFS NCD Walleye Technical Committee meeting held at the 68th Midwest Fish and Wildlife Conference in Madison, Wisconsin in December. Mike Mason represented Iowa at a VHS forum and a Fisheries Chiefs meeting held at the Conference.

2007

PRODUCTION REPORT

BIG SPRING HATCHERY

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Dave Gould	**Natural Resources Technician 2**
John Richmond	**Natural Resources Technician 1**
Ryan Sindelar	**Natural Resources Aide**

Gary Siegwarth, Hatchery Manager
Elkader, Iowa

INTRODUCTION

Big Spring Hatchery is located along the Turkey River in Clayton County, approximately ten miles northwest of Elkader, Iowa. The facility houses 24 cement flow-through raceways. The use of 4 rock-lined earthen ponds used in previous years for rearing brown trout was discontinued in 2004. The hatchery serves as a rearing station for growing rainbow and brook trout from fingerling to catchable size. Personnel at the hatchery are also responsible for stocking and maintaining 17 streams and two lakes in northeast Iowa. Four additional seasonal trout lakes were added in 2006 as part of a promotional urban stocking program.

In 2007, production requests for streams and special promotional winter fisheries totaled 101,055 rainbow trout, 4,260 brown trout, and 6,730 brook trout. The combined total for the three species was 112,045 trout.

PRODUCTION TECHNIQUES

Water supply for this facility comes from the largest coldwater spring in Iowa. Average flow of the spring is 18,000 gpm with water temperatures ranging between 46° and 52 °F. Water temperatures actually drop below 40° F for a brief period during spring snow melt when super cooled water enters the aquifer from surface water runoff. Dissolved oxygen content of incoming water ranges from 6.00 to 9.75 ppm, with the lower readings occurring during high runoff events within the Big Spring Basin.

Trout are spawned and produced at the Manchester Hatchery prior to being hauled to Big Spring Hatchery as fingerlings. Rainbow trout fingerlings are reared in the raceways at a maximum density of 11,000 fish per raceway. The majority of trout reared at this facility consist of Shasta strain rainbow trout. Since 1995, brook trout have been reared and stocked in conjunction with rainbow and brown trout.

Daily feeding rations are determined using a computer program developed by hatchery personnel. The daily growth and feed conversion rates for this program were established from raceway production experiments. The maximum daily growth rate for the Shasta strain of rainbow trout was found to be 0.03 inches/day and 0.023 inches/day for brown trout. Feeding rates are adjusted on a weekly basis and allowances can be made for special circumstances such as turbid water conditions. Monthly raceway check-weights are taken to determine if fish are growing according to the computer projections or to make feeding rate adjustments. Some of the raceways are fed reduced rates in order to stagger fish growth. This is done because the stocking season extends from April through October and the target fish size for stocking is 0.50 lbs.

Fish are fed twice daily with an extruded, slow sinking, steelhead diet (45% protein) produced by Nelson & Sons Inc. located in Murray, Utah.

Raceways are cleaned 2-3 times weekly during feeding and daily mortalities are picked up and recorded in order to monitor potential fish health problems and to determine annual production losses from known mortality. Total mortality was determined by subtracting trout harvested from the raceways from the initial number of fingerlings distributed in the raceways during November.

METHODS

Calculating Production

Total production represented the cumulative total weight of trout stocked, transferred to Manchester or Decorah, and total mortality counts. The weight of dead fish was determined from monthly raceway check weights. Net production was determined by subtracting the total weight of fingerling trout transferred into Big Spring Hatchery in 2007 from total production reported in Table 4.

Table 4. *Total annual net production of rainbow, brook, and brown trout reared at Big Spring Hatchery, 2007.*

	Rainbow Trout		Brown Trout		Brook Trout	
	Number	Weight	Number	Weight	Number	Weight
Catchables Transferred Out	41,880	17,813	9,800	1,600	880	275
Catchable Trout Stocked	113,521	58,521	0	0	11,525	6,977
Catchable Size Trout On Hand	37,960	17,835	0	0	0	0
Mortality/Missing Fish	654	325			895	315
Total Production	**193,361**	**93,989**	**9,800**	**1,600**	**12,405**	**7,567**
Fish Transferred In						
Fingerlings (2006)	175,425 [A]	3,484	9,700	114	12,400	789
Catchables left from 2006	17,580	9,260	0	0	0	0
Transferred from Genoa	1,010	505			900	290
Net Production[B]	**NA**	**81,245**	**NA**	**1,486**	**NA**	**6,488**

[A] Total number of fingerling rainbow trout transferred in (175,425) was determined when trout were inventoried and distributed in raceways at Big Spring in November. Documents from Manchester indicated 176,069 fingerling rainbow trout, 12,025 brook trout and 9,576 brown trout were transferred in, which represents a difference of less than 1%.

[B] Net production was determined by subtracting the weight (lbs.) of fish transferred in from total production.

Determining Costs

All hatchery employees keep a daily record of specific work activities. Since all work activities at the hatchery are not fully related to trout production and stocking, this record of work activities provides a means of determining actual costs related to trout production and stocking. A total of 6,947 work hours were available in 2007 (3 full-time and one 3 month employee that worked 547 hours). Of those hours, a combined total of 2,376 hours (34.2%) was spent on fish culture, property maintenance (related to the hatchery), and equipment maintenance. A total of 1,191 hours (17.1%) was related to fish distribution. Total expenditures for Big Spring Hatchery in 2007 were $284,000. Of this total, $39,550 was spent on feed. The net expenditures, excluding feed costs, totaled $244,450.

The cost of production was determined as follows: (1) net expenditures at the hatchery were multiplied by the percent of time employees spent doing fish culture, property maintenance, or equipment maintenance ($244,450 x 34.2%); (2) total feed costs ($39,550) were added to the above equation (1). This total ($123,152) was used to represent the cost of production (Table 5).

An estimate of total feed cost per pound of production was determined by dividing total feed costs by total net production (Table 5). This was done to evaluate production based feed costs annually and provide a cost based performance measure among specific feed types being used.

Since 1999, the cost of fish distribution to the stocking destination was determined by multiplying the percent of time spent on fish

distribution (1,191 hours divided by 6,947 total hours as determined from the daily record of work activities) by the net expenditures ($244,450 x 17.1% = 41,909). It was believed this was somewhat of an overestimate due to using "net expenditures" as the multiplier in the above equation. Therefore, the following formula will used in an attempt to provide a more accurate cost of fish distribution: Labor cost related to distribution ($208,000 x 17.1%) $35,568 + vehicle maintenance and upkeep $3,898 + vehicle depreciation $6,930 + gas used for distribution $7,720 which equals $54,116. Overall cost of production and stocking was determined from the sum total of production and fish distribution costs (Table 5). For consistency and comparative purposes, results from both formulas are presented in Table 5.

RESULTS

Production

A summary to total net production, as well as stocking and transfer totals is provided in Table 4. Total net production was 81,245 lbs for rainbow trout, 1,486 lbs for brown trout, and 6,488 lbs for brook trout (Table 4). This represents a combined net production total of 89,212 lbs.

Overall feed conversion rate (1.15) was excellent (Table 5). The main factor leading to an improvement in feed conversion rates in recent years was a change in feed type to an extruded slow sink steelhead diet. The new diet is fed at a lower rate and appears to be more efficiently digested based on observations of substantially reduced solids (fecal and wasted feed) present in the raceways during cleaning. Despite improved feed conversion, average feed cost per pound of production continued to increase from previous years to $0.46 in 2007. This is directly related to the price increase for feed.

Observed and unaccounted mortality was less than 1% for rainbow trout, which is lowest annual mortality ever documented for Big Spring. However, mortality for brook trout was 7.2%, which was mainly due to fall die offs of maturing males and furunculosis. Most rainbow trout mortality appeared to be due to injury from attempted predation from great blue herons or raccoons. Efforts to control

Table 5. *Feed conversion and estimated costs for production and stocking at Big Spring Hatchery in 2007.*

Total net production (pounds)		89,212
Total pounds of feed used		102,750
Feed conversion[1]		1.15
Feed cost/pound of production		$0.46
Total cost of production		$123,152
Production cost per pound of trout produced		$1.38
Total cost of fish distribution	$41,909[A]	$54,116[B]
Distribution and stocking cost per pound	$0.47	$0.61
Overall cost of production and stocking	$165,060	$177,268
Overall cost per pound of production and stocking[2]	$1.85	$1.99

[1] Feed conversion does not reflect weight added to brood fish.
[2] Does not include an estimated cost of $0.18 per fish for producing trout to fingerling size prior to their transfer to Big Spring.
[A] Cost of fish distribution as calculated using the formula similar to previous years
[B] Cost of fish distribution as calculated using more specific parameters (see text under "determining costs")

predation on fingerling trout using mesh net coverings have proven to be highly successful. In addition, reducing predation from large congregations of herons at Big Spring using various scare tactics, such as fireworks, continues to be successful.

Total mortality at Big Spring is substantially lower than years prior to 2001. In past years our mortality estimates were based on numbers recorded on transfer sheets when small fingerlings were shipped from Manchester. In recent years we obtain a more accurate initial number when our larger size fingerlings are inventoried and distributed into raceways in November. Over the past two years, differences between Manchester transfer totals and inventory totals when fingerlings have been distributed in the raceways in November have been less than 1%.

No serious fish health problems have been encountered over the past two growing seasons. Part of this can be attributed to trout having access to first use spring water in every production raceway. This was accomplished by eliminating the "B" section of the raceways which received discharge water from the front half of the raceway. The separating screens and stop logs were simply eliminated between the front and back half of the raceways.

Stocking

A total of 113,521 catchable rainbow trout and 11,525 brook trout were stocked in 15 streams and six winter ponds in 2007 (Table 4). This represented a 12% increase in the number of trout stocked in 2006. Stocking reductions in previous years was due to cutbacks related to budget reduction efforts. Stocking totals for 2008 are expected to climb even higher due to additional promotional urban lake stockings and expanded numbers stocked at Big Spring due to improved angler access and other fishing attractions such as the kids fishing pond. A total of 41,880 rainbow trout were transferred to Manchester.

The size of trout stocked in 2007 averaged 0.51 pounds for rainbow trout and 0.60 pounds for brook trout. One of the goals prior to the stocking season was to be more consistent in targeting an average stocking size of 0.55 pounds as a feed cost reduction measure. This was achieved with few angler complaints. The average size of trout transferred to Manchester was also reduced in 2007 in an effort to reduce the number of trips.

Costs

Production cost per pound of trout produced was $1.38 and the overall cost of production and stocking was $1.85 per pound (Table 5). An alternative way for calculating fish distribution costs resulted in an overall production and stocking estimate of $1.99 per pound. Both estimates were substantially less than previous years even though overall costs were higher. This is due to increased overall production, which reduced average costs per pound of production. We were able to achieve higher overall production, while at the same time conducting and funding several stream access and habitat projects from our allotted budget.

The fixed costs associated with the hatchery facility and full-time personnel drive up production costs relative to the pounds of trout produced as production falls below full capacity. With expansion of the urban trout stocking program, we expect to maintain higher trout production. This will continue to reduce overall production costs on a cost per pound basis.

Based on the average size of fish stocked and the cost per pound to produce and stock ($1.85/lb), average cost to the angler in 2007 was $1.06 per fish compared to $1.20 per trout stocked in 2006. This includes an estimated cost of $0.12/fish to rear trout to fingerling size at Manchester prior to being transferred to Big Spring. Production costs as measured in a cost per pound basis are directly related to the level of production. We are also involved in

numerous projects outside the scope of the hatchery operation, but directly related to the overall trout program. Costs of these projects are sometimes difficult to subtract from actual production costs.

Trout inventory

Budget cutting efforts in 2003 have had a lasting effect related to better targeting catchable trout production needs within close limits of what is requested. To get a better handle on inventory, stocking needs, and to provide better overall planning for production needs two years in advance, a more comprehensive inventory worksheet was developed. The worksheet will also help to better track the specific location and trout inventory by species among hatcheries. This comprehensive worksheet takes into account the cumulative inventory and stocking requests for all three facilities through 2009, which will be more beneficial for decisions on trout spawning needs and distribution of fingerling trout to Big Spring and Decorah. This cumulative inventory worksheet is displayed in Table 6.

EVENTS AND PROJECTS

Improved Stream Access—In 2007, we continued to make improvements in the angler access trail system on the trout streams we stock. We also received numerous positive comments about the improved access. The improved trail system and stream access has increased utilization of target stream sections by the public. Many of these target reaches had been previously less utilized due to poor access.

Turkey River Angler Access Project—The third and final section of an angler access project was completed along the Turkey River adjacent to the hatchery in 2007. The goal of the project was to reshape the existing riverbank to allow for easier angler access. The project included placing various patterns of large boulders in the river adjacent to the angler access trail. Some of the boulders weighed as much as 10 tons each and will provide better habitat diversity adjacent to the angler trail. This segment of the project cost around $3,000. These projects significantly increase angler access on the Turkey River adjacent to the hatchery and we expect a substantial increase in the number of anglers fishing at Big Spring.

Winter Pond Stockings/Promotion of Special Events--In 2007, we continued our efforts to increase public awareness and participation in the special trout fisheries in Cedar Falls and Dubuque by promoting family fishing events in conjunction with the spring stocking. The goal was to promote recreational fishing opportunities in these urban areas and to spur

Table 6. *Cumulative inventory and stocking needs worksheet for Big Spring, Manchester, and Decorah.*

	2008 Fingerlings on Hand	
	Rainbow	Brook
Manchester	67,000	18,000
Decorah	125,000	13,950
Big Spring	135,000	15,300
Big Spring (holdovers)	18,000	
Totals	345,000	47,250

	Catchable Trout Needed for 2008	
	Rainbow	Brook
Manchester	88,500	16,500
Decorah	106,500	16,000
Big Spring	120,000	10,000
Additional Urban Needs	20,000	
Totals	335,000	42,500
Surplus or (shortage) for 2008 **(mortality not included)**	**10,000**	**4,750**

	Catchable Trout Needed for 2009	
	Rainbow	Brook
Manchester	??	??
Decorah	??	??
Big Spring	123,320	10,000
Totals	298,320	44,890

increased fishing license and trout stamp sales. The promoted family fishing events at both Heritage Pond and North Prairie Lake drew nearly 250 anglers. We will continue to identify local partners and strategies for better promoting and improving of these urban trout fisheries.

Directional Signage--We have been implementing a more visible system for informing/directing the public to our trout streams and for providing better information once they get there. In 2007, we added improved directional signs and stream identification signs to a number of areas.

Kid's Fishing Pond—In 2007, we initiated a kids only fishing pond at Big Spring. We utilized one of the abandoned brown trout rearing ponds on the east side of the hatchery. The pond was stocked weekly with rainbow and brook trout, which almost guaranteed success. The pond turned out to be extremely popular and drew hundreds of kids and their parents over the course of the summer and fall. Families came from long distances with the sole objective of bringing the kids to fish in the pond. Rules that were posted on the edge of the pond included:

1. The pond is open for kids 12 and under.
2. There is a 2-trout limit per child per day (which applied to trout caught and released).
3. All trout kept must be part of the licensed adults 5-trout limit, unless the child has their own trout privilege.
4. Please to not use bait if you intend to catch and release your 2 trout.

We plan to interconnect the remaining 3 ponds and expanding the kids fishing area this coming summer. Other plans include an interpretive kiosk that will aid beginning anglers. We also plan to keep a yearly tally of anglers we observe using the pond. There were very few problems encountered.

Wild Brown Trout Rearing—In 2007, a total of 9,800 French Creek fingerling brown trout were experimentally reared to a larger size. These fish were excess fingerlings that were not utilized as part of the regular wild fingerling stocking program. These fish were reared in a raceway covered with a shade house to an average size of 0.16 pounds or 6.1 fish per pound. The purpose of the shade house over the raceway was to reduce direct sunlight and simulate overhead cover. This was used because the fish were very skittish, hung to the bottom and were rarely seen. The best feeding time was late in the day within an hour of sunset. The minimum average cost for rearing and stocking these fish was $0.44 each. This includes an estimated cost of $0.18 per fish rearing cost at Manchester. In a side by side comparison of the advanced and smaller size fingerlings stocked in three different streams, there was not much of a cost advantage to justify use of the advanced size trout (Dan Kirby, personal communication of results that will be part of the 2007 Management Report).

Spring Water Quality—Water samples were collected from Big Spring during several runoff events in 2007 to better identify water quality issues affecting the spring. The biggest discharge event came during a rapid spring snowmelt in April. During this melt event, discharge nearly doubled and water temperatures of the spring dropped into the upper 30°F). The most striking increase of the parameters measured was E-coli, which jumped to over 3,600 organisms per liter. As a perspective, DNR beach warnings are issued when levels reach 280. Within the watershed, several livestock operations had spread manure over frozen ground or on top of snow. E-coli is very good indicator of the large input of manure that was suspected due to the coloration and odor. There are currently no rules that prohibit spreading manure over snow, even in environmentally sensitive or flood prone areas. Another concern is the growth hormones and other enzymes associated with livestock manure that has been shown to have adverse effects on fish populations even at low levels. Better guidelines need to be implemented and communicated to livestock producers to solve

water quality problems and help them to keep the nutrients on the field.

This information along with observations on the connection between surface runoff and discharge quality of Big Spring was presented at the annual Wisconsin Groundwater conference this past fall in Dubuque.

2007

PRODUCTION REPORT

DECORAH HATCHERY

Brian Malaise	**Natural Resources Biologist**
Chris Larson	**Natural Resources Technician 2**
Wayne Wingert	**Natural Resources Technician 2**
Nick Eglseder	**Natural Resources Aide**
Shane Knipper	**Natural Resources Aide**

Brian Malaise, Hatchery Manager
Decorah, Iowa

INTRODUCTION

The Decorah Fish Hatchery (DFH) is located approximately 1 mile south of the city of Decorah in Winneshiek County. The hatchery consists of 24 cement flow-through raceways and 3 rubber lined earthen ponds. The DFH is production rearing station for growing Shasta Rainbow and St Croix Brook trout. Fingerling trout are transferred from the Manchester Fish Hatchery (MFH) and reared to a catchable size fish. The hatchery is responsible for stocking 16 put-and-take streams in Winneshiek, Allamakee, Howard, and Mitchell Counties. The hatchery also stocks two seasonal urban lakes, one in Mason City and one in Sioux City.

In 2007, production requests for streams and seasonal urban fisheries stocked by DFH totaled 105,695 rainbow trout and 11,307 brook trout. The combined total production of the two species was 117,002.

The DFH staff consists of three permanent personnel and one natural resource aide. The natural resource aide is employed from April through October. The primary duties for hatchery personnel include; fish production and distribution to area streams, facility and grounds maintenance and public relations.

PRODUCTION TECHNIQUES

The water supply for the hatchery is Siewers Spring which is the second largest coldwater spring in Iowa. It is also the headwaters of Trout Run Creek a popular put-and-take trout stream that flows through the hatchery grounds. Siewers Spring's flow varies widely throughout the year, but historical flows have been between 3,000 to 10,000 gallons of water per minute (gpm) at 43° to 57° F. However, 2007 was the fourth wettest year on record for the Decorah area, so the spring's flows were higher then normal and have maintained higher then normal flows throughout the fall and winter months. The hatchery uses between 2,300 to 3,400 gpm depending on the biomass in the hatchery. The flows through each raceway usually vary from 150 to 650 gpm. This is dependent on the size and number of fish in each raceway and the location of the raceways. The B and C sections of the raceways can receive second and third pass water. The water gravity flows from the spring to the pump house and is then pumped up to a degassing tower where nitrogen gas is removed and oxygen is injected from the facility's pressure swing adsorption system. The oxygenated water gravity flows from the degassing tower into the raceways at levels of 14-15 parts per million.

The sediment load in the spring water varies widely throughout the year but, becomes higher during periods of heavy runoff within the watershed. Several periods of heavy precipitation in 2007 increased spring water volume and the subsequent silt load present in the hatchery water supply. The hatchery has a water clarifier basin that is designed to settle sediment out of the water before it flows through the hatchery. However, during periods of high turbidity the raceways become clouded interrupting fish feeding. In the month of August, fish were only fed 8 days because the Decorah area had several events of abnormally heavy rainfall.

Hatchery personnel removed several tons of sediment from the clarifier after the spring and summer rains and run off periods. The sediment material that was removed from the clarifier was used around the hatchery grounds and given to a local farmer for landscaping around his property.

The Broodstock trout are spawned at MFH in late fall through early winter and the fingerlings are transferred to DFH in late spring to early summer. Shasta strain rainbow trout comprised 86% of the fish reared and stocked by the Decorah Fish Hatchery. The rainbow trout fingerlings/catchables are reared in raceways at a maximum density of 7,500 fish per raceway. The brook trout are initially reared in raceways and transferred into lined earthen ponds at densities of 12,000-16,000 fish.

Fish are fed Silver Cup slow sinking extruded steelhead diet (45% protein) manufactured by Nelson and Sons Inc. in Murray, Utah.

Daily feeding rates are determined using a computer program developed by hatchery personnel. The maximum daily growth of Shasta strain rainbow trout in Iowa trout hatcheries was found to be 0.028 inches/day and 0.023 inches/day for St Croix strain brook trout. Monthly sample counts are performed to monitor fish growth. Feeding rates are adjusted on a weekly basis with allowances being made for special circumstances such as disease or poor water conditions. Some of the raceways are also fed reduced rations in order to control fish growth. This is done because the stocking season extends from April through October and the target fish size for stocking is between 10-12 inches long and 1/2 pound a piece.

The small fingerlings are fed three to four times daily initially and reduced to twice a day as fish become larger. Raceways are flushed 3-4 times a week and mortalities are removed daily. Fish mortalities are recorded to monitor for potential fish health problems. The head and tail sections of raceways are dewatered and cleaned of silt and algae approximately every 2 months.

PRODUCTION

A summary of total annual production, as well as stocking and transfer totals is provided in Table 7. Total net production was for rainbow trout was 237,985 (52,868 lbs.) and 37,230 (4,444 lbs) for brook trout. This represents a combined net production total of 275,215 (57,312 lbs).

The overall feed conversion for the hatchery in 2007 was 1.29. The average feed cost per pound of production was $0.47 for rainbow trout and $0.91 for brook trout. This year's feed conversion and cost per pound of production is higher then in past years because of the brook trout loss in the earthen pond due to bird predation.

Total fish loss to predation and disease was estimated at 9.35% overall. This is an increase from past years. The two contributing factors in the rise in fish loss were the disease outbreak in the fingerling brook trout (discussed in fish health section) and the heavy predation in the brook trout pond from great blue herons and bald eagles. It is estimated the hatchery saw an overall loss of approximately 36% or 6,534 fish in the

Table 7. *Total annual production of rainbow and brook trout at Decorah Trout Hatchery, 2007.*

	Rainbow Trout		Brook Trout	
	Number	Weight(lbs)	Number	Weight(lbs)
Catchable trout stocked	105,695	54,764	11,307	5,889
Catchable transferred to Manchester	0	0	0	0
Transferred to Big Spring	0	0	0	0
Held-over winter fishery	8,900	4,709		
Total Catchable Production	114,595	59,473	11,307	5,889
Fingerlings on hand on 12/31/06	99,792	17,820	18,191	5,242
Net Catchable Production(lbs.)		**36,938**		**647**
Fingerlings				
Fingerlings received from Manchester	135,000	2,017	30,000	300
Fingerlings on hand on 12/31/07	123,390	17,947	15,423	3,965
Fingerlings transferred to Manchester	0	0		
Fingerlings transferred to Big Spring	0	0	0	0
Fingerlings Stocked			10,500	132
Net Fingerling Production	**123,390**	**15,930**	**25,923**	**3,797**
Total Production by Species (lbs.)		52,868		4,444
Total Hatchery Production: 57,312 lbs				
Total number of fish stocked or transferred: 127,502				

brook trout pond due to bird predation. Hatchery personnel counted up to 40 herons around the ponds every morning throughout the summer and fall. There is also pair of bald eagles nesting across the street from the hatchery approximately 100 yards from the brook trout ponds. Predation by herons, eagles, osprey, raccoons, mink and kingfishers has always been a recurring problem. Bird netting over the raceways has been moderately successful for the last several years. This summer however, there were three different incidents where raccoons walked on the bird netting causing it to sink into the water allowing the fish to get gilled in the mesh of the net. The problem raccoons were live trapped and transported to a local wildlife management area. This year an employee at the hatchery designed and built a motion activated bird deterrent sprinkler system that was installed on the raceway wall of the raceway that was being stocked out of. The sprinklers worked with an infrared eye and would spray in 10 second burst of water anytime the beam was broken by predators walking on the raceway walls. This system seemed to work very well and gave protection to fish in the raceways that did not have any bird netting on them. Around the perimeter of each of the earthen lined ponds there is electric fencing installed to deter raccoons and some herons from depredating.

FISH HEALTH

There were no disease outbreaks in rainbow trout in 2007. No fish at DFH were treated for *flavobacteriosis* or

bacterial gill disease (BGD) for the first time in several years.

The Chloramine-T INAD #9321 continues to be administered by the USFWS in Bozeman, Montana for the control of BGD. In 2005, the DNR Environmental Service Division incorporated a limit not to exceed 0.1 mg/l total chlorine in the hatchery effluent discharge from the Chloramine-T treatments into our NPDES permit.

The brook trout fingerlings did have a chronic outbreak of an unknown disease. The outbreak lasted for about five months, with the highest mortalities occurring May through July. During this time hatchery personnel completed approximately 250 necropsies on the moribund fish. It was suspected that the fish had a possible *Aeromonas sp.* infection. Almost all the moribund fish exhibited the same signs. In the raceways, the fish were very lethargic and dieing evenly throughout the raceway. The external signs consisted of; fish being dark in color and hemorrhaging of the fin bases. Several fish also had external lesions. The internal signs consisted of; poetical hemorrhaging, swollen and hemorrhaged posterior intestine, anemic in the gills and liver, swollen posterior kidney and a normal sized spleen. The initial outbreak occurred shortly after the fish were transferred from the Manchester Fish Hatchery coinciding with the spring going off color due to a heavy rainfall event in the area shortly after the transfer. The raceway of fish at Manchester which the brook trout were transferred from showed initial signs of a disease outbreak a few days prior to the outbreak at DFH. The fish were fed several medicated feed treatments of feed with terramycin from Silver Cup and feed top coated by hatchery personnel with Romet 30 with little to no effect.

CALCULATING PRODUCTION COSTS

Total production represents the cumulative total weight of trout raised at DFH in 2007. Net production was calculated by subtracting total weight of fingerlings in the hatchery on December 31, 2006 from the final weight of the fish either stocked or transferred to the other hatcheries in 2007 (Table 7).

All hatchery employees keep a daily log of specific work activities. Because all work activities at the hatchery are not specifically related to trout production and stocking, this record of work activities provides a means of determining actual costs related to trout production and stocking. Three categories of the employee work activities are used to determine production cost; 1) Fish Culture 2) Equipment and Grounds Maintenance and 3) Distribution. A total of 7,510 work hours were available from three full-time and a combination of two seasonal employees. Approximately 4,687 hours (62%) were spent for fish culture and equipment and grounds maintenance and 1,376 hrs. (18%) was related to fish distribution. A grand total of 6,063 hours (80.7%) were expended by hatchery personnel in 2007 on fish culture, equipment and grounds maintenance and fish distribution. Personnel spent the remainder of time performing aquatic education, public relations, assisting others, training, administration and leave.

Decorah Fish Hatchery's total 2007 budget year, including salaries, was $326,018.00.

The cost of feed included in this budget year was $29,030.53. In 2007 DFH received 3,250 pounds of feed from Genoa National Fish Hatchery which lowered the hatchery's overall feed cost. Net expenditures excluding feed were $296,987.00. Cost of production was calculated by multiplying net expenditures by the percentage of time spent on fish culture and equipment/ground maintenance for a cost of $184,132.00. (296,987.00 x 62%)

The cost of feed was then added in to the above figure for a total of $213,162.53 for DFH total production cost. Cost per pound was $3.72. DFH average production cost was $1.93/catchable trout. This year's production cost was higher then in past years because of the brook trout loss in the earthen pond due to bird predation. The estimated cost for Manchester to produce fingerlings was $0.19/fish.

Personnel distribution time costs of $39,470.04 were added to the production cost for an overall cost of $252,632.57 and overall cost per pound of $4.41 (Table 8). Average cost to produce and stock each catchable trout was $2.29.

STOCKING

Hatchery personnel drove a total of 23,252 miles in making 420 trips to stock 117,002 catchable trout and 322 broodstock into 16 streams and two seasonal urban lakes in 2007 (Table 8).

The average size of trout stocked in 2007 by DFH was 0.52 pounds each or 1.93 fish/pound for both species.

Angler counts were conducted at each stream on stocking days. Angler use during April-October by stream is shown in Table 9. The two streams that had the highest angler counts in 2007 continue to be Twin Springs and Trout Run. Both streams are located near Decorah. Twin Springs Creek also flows through the city campground adding to its popularity. June was the month with highest number of anglers observed for the year, with 438 and October had the lowest number with 176. The decline in the number of anglers observed in

Table 8. *Net production by species and cost at Decorah Trout Hatchery, 2007.*

	Rainbow Trout		Brook Trout	
	Number	Weight(lbs)	Number	Weight(lbs
Total net production	237,390	52,868	37,230	4,444
Total pounds of feed used		63,640		10,360
Total feed cost by species	$24,946.88		$4,061.12	
Feed Cost/lbs. of production	$0.47		$0.91	
Overall feed conversion	1.29			
Total distribution cost	$39,470.04			
Total cost of production	$213,162.53			
Production and stocking cost	$252,632.57			
Production cost/lb	$3.72			
Overall cost /lb	$4.41			

[a] Does not include an estimated cost of $0.19 per fish for producing trout to fingerling size prior to their transfer to Decorah.

Table 9. *Angler counts at streams stocked by Decorah, April-October 2007.*

	A	M	J	J	A	S	O	Total
Patterson Creek	9	14	25	*	*	15	9	72
Silver Creek	5	3	7	*	*	2	2	19
Waterloo Creek	11	26	26	26	22	23	8	142
Bigalk Creek	14	7	14	29	16	11	3	94
Spring Creek	20	15	10	1	10	20	6	82
Turtle Creek	36	59	43	24	16	39	17	234
Wapsi River	1	9	0	*	*	1	0	11
Bohemian Creek	30	30	25	40	7	14	1	147
Coldwater Creek	25	34	22	33	28	30	14	186
Coon Creek	*2*	*0*	*0*	*5*	*0*	*0*	*0*	7
North Bear Creek	*25*	*21*	*14*	*11*	*20*	*9*	*22*	122
South Bear Creek	*7*	*15*	*29*	*24*	*9*	*14*	*11*	109
Trout River	*0*	*57*	*12*	*11*	*4*	*22*	*18*	124
Trout Run Creek	51	109	99	78	61	60	37	495
Twin Springs Creek	24	19	112	57	43	33	28	316
West Canoe Creek	3	1	0	*	*	2	0	6
Totals	**263**	**419**	**438**	**339**	**236**	**295**	**176**	**2,311**

Italicized streams are unannounced stockings.
All streams are unannounced in October.
* not stocked in July-August

October is largely due to all streams stocking by DFH for the month are unannounced.

AQUATIC EDUCATION

The hatchery sees thousands of visitors each year. They come both to fish Trout Run Creek and to tour the facility and feed the fish. Hatchery personnel conducted 28 scheduled tours (707 students) to area school groups. There was a noticeable decline in school tours in 2007 due in part to the increase in fuel cost. Siewers Spring continues to be a popular site for everything from prom and senior class pictures to weddings. This year there were two weddings held in the picnic area.

The hatchery also had four area high school students participate in a job shadowing for a day programs. Two of those job shadows volunteered at the hatchery for three months each for class credit and potential career opportunities. The hatchery also had one person serve 48 hours of community service.

Three fishing clinics were held in conjunction with Decorah Parks and Recreation and Decorah Middle School and two adult trout fishing outreach programs in partnership with the local Trout Unlimited Iowa Driftless Chapter and Decorah Parks and Recreation.

Hatchery personnel continued to work with the Trails of Winneshiek trail committee on the construction of a bike path on the north end of the hatchery property. This past summer, two trees were removed and a concrete path was poured. The construction of a limestone retaining wall at the base of the hatchery was started.

The DFH personnel continue to strive to provide excellent customer service to anglers and the hatchery visitors by answering all questions and providing accurate information along with

addressing any concerns they have in a professional manner.

HATCHERY PROJECTS IN 2007

In addition to trout culture responsibilities, hatchery personnel were active with teaching hunter safety courses, school presentations, state fair booth, CWD deer collections, law enforcement, cooperating with fisheries management with brood trout collections, northern pike and walleye spawning, creel surveys, habitat work, population estimates and other projects as needed.

- Repaired hatchery distribution tanks and converted the oxygen systems to point four systems.
- Construction of fisherman handicap accessible path and fish area along Trout Run Creek in the hatchery property.
- Removed dieing maple trees along hatchery driveway and cotton wood tree by the spring and trimmed dead wood out of trees around hatchery grounds.
- Repaired cracks on the raceway walls.
- Continued working on the hatchery prairie.
- Working with the Trails of Winneshiek trail group on construction of the Trout Run bike trail through the north end of the hatchery property. Also the construction of a limestone retaining wall between the hatchery and the bike trail.
- Continued to incorporated new fish culture techniques into the hatchery operations.
- Designed and built a motion activated sprinkler bird deterrent system for the raceways.
- Built a fish grading rack.
- Built new bathroom/lab in the hatchery office and septic system. Repaired construction mistakes.
- Replace water stained ceiling tiles in hatchery lab.
- Installed new liquid oxygen system.
- Replace sunken concrete on north end of the shop.
- Built and replaced fishing styles along area streams improving fishermen access.
- Mowed access trails along streams and repaired flood damage to stream crossing.
- Worked with landowners on fisherman access issues.

HATCHERY PROJECTS FOR 2008

- Establish a Friends Group for the hatchery.
- Finish the liquid oxygen system and put into operation.

- Install new heating system in the hatchery shop.
- Repair limestone chimneys on hatchery office and residence along with the walls on the latrine by picnic area.
- Replace windows and doors in the hatchery office and residence.
- Remodel residence bathroom.
- Paint hatchery office.
- Continue working with landowners on fisherman access issues.
- Continue to finish bathroom/lab problems.
- Continue working with Trails of Winneshiek trail group on the construction of the Trout Run bike trail through the bottom of the hatchery property. Replace the aluminum screen in the pump-house.
- Establish a standardized facility manual and label valves etc. to aid employees in responding to hatchery alarms.
- Submit information to local media to create awareness of trout stocking program and local fishing opportunities.
- Expansion of signs and photography is planned to provide visual aides for the visitors to the hatchery.
- Build an information sign for prairie.
- Improve the directional signage to the streams to assist anglers in locating the stocked areas.
- Sandblast and paint emergency generator radiator.

2007

PRODUCTION REPORT

MANCHESTER HATCHERY

David Marolf	**Natural Resources Biologist**
Randy Mack	**Natural Resources Technician 2**
Tom Rohde	**Natural Resources Technician 2**
Ken Linderwell	**Natural Resources Technician 1**

David M. Marolf, Hatchery Manager
Manchester, Iowa

INTRODUCTION

The Manchester Trout Hatchery is located four miles southeast of Manchester in Delaware County. The hatchery is Iowa's coldwater broodstock facility and Northeast Iowa District Headquarters for Fisheries, Wildlife and Law Enforcement.

Water supply for fish culture is from three Silurian springs, all within one-half mile of the hatchery. These springs are recharged by moisture percolating through the very sandy soils of the Spring Branch Creek watershed. This sand-filtering effect, coupled with the lack of surface conduits (sinkholes), keeps the spring water discharges relatively clean during wet weather. Total flow varies with seasonal fluctuations in weather from a record low of <500 gpm (1989) to >3,000 gpm. Normal flow is 1,500 to 2,000 gpm. During low flow periods, one of two wells is pumped to add between 300 and 400 gpm.

Influent water is constantly 50°F and is treated in packed columns to remove nitrogen gas and add oxygen prior to use in rearing units and the hatching house. The entire facility is capable of operating under gravity flow conditions with a reduced carrying capacity. The facility is equipped with an alarm system to alert two off-site and two on-site employees of power outage, low water flow and low oxygen line pressure during nonstandard work hours.

Four permanent personnel are generally adequate to complete responsibilities and goals of the Manchester Trout Hatchery. Several youths, assigned community service by the juvenile court system, were utilized for building and grounds maintenance projects throughout the year.

PRODUCTION TECHNIQUES

Two species of domestic trout are propagated at Manchester: Shasta rainbow and St. Croix brook trout. The rainbow trout are winter (December-February) spawners and the brook trout spawn in October. Future broodstock are selected randomly each year from our own stock at Iowa's three trout production facilities.

Broodstock are held in culture ponds until one week prior to spawning season. At this time they are transferred into 8 ft x 100 ft concrete raceways and segregated by species and sex. Primary egg production in rainbow trout comes from 3 year-old females with semen production from 2 year-old males. With brook trout, age 2 females and age 1 males are used.

During spawning season, females are anesthetized with MS-222 (250-300 ppm) and checked weekly for ripeness. Gravid females are taken inside the hatchery building and spawned. Ova are collected in a drip net from anesthetized females that have been rinsed in fresh water. Ova are transferred into plastic fertilization pans where semen from two males is added. After adding 1% saline solution to the gametes, the pan is stirred for about one minute with a feather, washed clean with fresh water and transferred into incubators.

The hatchery is equipped with eight, 8-tray Heath incubators where the eggs from each female are incubated separately in partitioned trays. The incubators have the capacity of holding eggs from 256 females. At eye-up, eggs are checked for percent eye-up and size (eggs/ml), then volumetrically measured into un-partitioned trays at not greater than 10,000 eggs/tray. Using a Masterflex peristaltic pump, fungicidal treatments are administered daily to trout

eggs at a rate of 500 ml for 15 minutes until just prior to hatch. Parasite-F (37% formaldehyde) does an adequate job of controlling fungus on trout eggs.

Sac fry remain in incubators until shortly before (3-5 days) gas bladder inflation. At this time, fry are transferred into 14 ft x 2 ft x 1 ft fiberglass tanks and auto feeding begins at swim-up using Nielson-type feeders. When fry are capable of eating No. 2 granules, they are transferred into 30'x3'x2½' concrete tanks also equipped with Nielson auto-feeders.

Fish food is manufactured according to U.S. Fish & Wildlife specifications and daily feeding rates are calculated according to Haskell's Feeding Equation. Feed rates are adjusted on weekly intervals. Tank space inside the hatchery building dictates when fingerlings are transferred either outside to concrete linear raceways or trucked directly to the other rearing stations.

Starting in October and continuing through March, one-half of the entire population of sub-catchable rainbow and brook trout are alternately on and off feed for intervals of two to four weeks. By feeding only ½ the population at any one time, we are able to maximize production while always maintaining a healthy water chemistry environment. Manipulating the feeding rates as stocking season approaches staggers the growth rate to prevent the entire population from reaching stocking size (≥2/lb) at the same time.

Raceway and pond carrying capacities are limited primarily by water flow. Guidelines for maximum capacities are based on oxygen consumption and Willoughby's formula is used to compute required water flow through each rearing unit. During normal operation, when carrying capacity is near, densities are reduced by splitting populations into more raceways or shipping fish to the two rearing stations.

FISH HEALTH

All aeration and degassing equipment functioned properly eliminating stress and providing a healthy environment for trout in all rearing units.

Equipment failure caused one mortality event in 2007. In October, circuitry affecting the speed control of the chemical (Formalin) pump used for antifungal egg treatments malfunctioned. This resulted in the over application of chemical by possibly 10-fold the correct dosage (500 ml/15 min.) This occurred over several consecutive days resulting in the loss of the entire production of domestic (355,000) and wild (3,600) brook trout eggs and a portion (33,000 eggs) for the 2007 wild brown trout production.

The domestic brook trout loss was replaced by receiving two shipments of eyed eggs from Wisconsin. Approximately 32,000 eyed St. Croix strain brook trout eggs were delivered from St. Croix Falls, Wisconsin State Fish Hatchery (SFH) and an additional 45,000 Coaster strain brook trout were shipped from Iron River, Wisconsin SFH. These shipments should allow us to fulfill spring 2008 fingerling and 2009 catchable requests.

The loss of 3,600 South Pine brook trout eggs was irreplaceable as it occurred too late in the spawning season for fisheries personnel to attempt to collect replacement eggs. No wild South Pine brook trout will be available for spring 2008 stocking.

Fortunately, the equipment failure occurred early enough in the brown trout spawning season that only two egg takes were adversely impacted. The loss of 33,000 brown trout eggs may result in a shortage of spring 2008 fingerlings. At this time, a reasonable projection of approximately 140,000 to 150,000 fingerlings can be assumed to fill the 160,000 2-inch fingerlings quota requested.

In late April, an outbreak of *Aeromonas sp.* occurred in a lot of 45,000 brook trout (75/lb) in raceway 5B. Before treatment with antibiotics (Romet), daily mortality had reached over 300 fish/day with a high of 427 on the day treatment was initiated. By the end of the 5-day feeding regime of Romet, mortality dropped to 81 fish. The following day, a 7-day feeding regime of Terramycin was begun. At the end of this treatment, there were zero mortalities. A total of 2,264 mortalities were recorded.

A recurrence of *Aeromonas sp.* occurred in mid-June in the same lot of brook trout in raceway 5B. By June, the population had been reduced to 20,000 fish (30/lb.) Antibiotic (Romet) treatment was initiated when mortalities reached 10/day. After 3 days, the fish were moved to raceway 8A where a greater water supply was available. After 7 days, mortalities dropped to 4/day. A total of 175 mortalities were recorded. No further problems have occurred since.

DOMESTIC TROUT PRODUCTION

The number and weight of fish produced, overall feed conversion and cost of production are listed in Table 10.

Total fish production was 55,074 pounds, with 65,320 pounds of feed purchased, resulting in a 1.19 feed conversion rate.

Table 10. *Trout production, feed conversion and costs for 2007.*

	Number	Pounds
Domestic Fingerlings:		
Rainbow	331,700	5,603
Brook	58,950	870
TOTAL (dom. fing.)	390,650	6,473
Wild Fingerlings:		
Brown (2")	158,750	611
Brown* (7")	6,184	109
TOTAL (wild fing.)	163,934	720
Forage – All species	328,440	1,655
Catchable Trout:		
Rainbow	61,254	32,184
Brook (St. Croix)	9,320	5,178
TOTAL (catchables)	70,574	37,362
Weight added to catchables shipped in (all species)	40,570	4,628
Broodstock – All species	856	3,405
Total Trout Shipped Out	666,584	52,594
Less 1/1/07 Inventory Weight		-16,807
Plus 1/1/08 Inventory Weight		+19,283
Total 2007 Production		**55,074**
Total 2007 Feed Consumption		65,320
Overall Conversion		**1.19**
Total Production Cost		$175,719.16
Cost per Pound		**$3.19**

*Extra 2006 brown trout production returned from Big Spring Hatchery.

Production costs in 2007 were $175,719.16 for $3.19/pound.

Production was up from 2006 because of increased available water flow. In October 2007, the hatchery had record or near record water available for fish production.

In 2007, of the original 67,000 juvenile rainbow trout held in the 12 raceways and A1 pond, 61,254 catchable-size trout were stocked for a harvest rate of 91.4%. Currently at the Hatchery, 12 outside raceways (5,500 trout/raceway) are devoted

to the production of catchable rainbow trout for the upcoming 2008 stocking season.

In March 2006, excess brook trout production was shipped to Rathbun Hatchery for muskellunge forage. Shortly after this, the decision was made to discontinue completely the production of domestic brown trout in Iowa. This resulted in a shortage of brook trout fingerlings for the 2007 stocking season. The shortfall was compensated for by producing more rainbow trout catchables for the 2007 stocking season to make up f or the brook trout shortage. Because of this, only one pond (B pond) was devoted to brook trout production in 2007. Of the 10,900 brook trout in B pond, 9,320 were stocked for a harvest rate of 85.5%. Currently, 20,000 brook trout are being held in B pond (14,000) and A1 pond (6,000) respectively for use in the 2008 stocking season.

Future broodstock are selected randomly from sub-catchable production fish destined for the current year's put-and-take stocking program. Approximately 800 rainbow trout, selected randomly and proportionally from rearing units at each facility, are pooled in a raceway at Manchester. The following December, these fish are sorted by gender. The males are used for the current spawning season as 2 year olds to fertilize eggs taken from 3-year-old females. Near the end of the rainbow trout spawning season, all 2-year-old females are anesthetized and sorted to select 250 non-spawners for the following year's egg production. Females selected for egg production are then put in a holding pond from February through November. All 2-year-old spawners (precocious) and non-spawners in excess of the 250 *selected* fish are stocked into Iowa trout waters the following stocking season. Determination of gender of a 2-year-old rainbow trout is not an exact science. Each year, when the rainbow trout female holding pond is harvested just prior to spawning season, 10 to 15% of the 250 fish turn out to be males.

Table 11. *December early spawning of three-year-old female rainbow trout.*

Year	Total # Females Spawned	# Spawned Before Christmas	% Spawned Before Christmas
1996	172	25	14.5
1997	183	27	14.8
1998	122	32	26.2
1999	182	64	37.9
2000	170	52	30.6
2001	204	50	24.5
2002	189	54	28.6
2003	186	47	25.3
2004	209	92	44.0
2005	214	42	19.6
2006	209	32	15.3
2007	177	35	19.8

Starting with the 1998-99 spawning season, a larger than desired number of 3-year-old female rainbows were ripe on the first date that eggs were collected. Ideally, the majority of rainbow females will spawn in January. Table 11 tracks the number and percent of rainbows that spawn prior to Christmas. In 2003, to prevent the peak of rainbow spawning season from moving earlier, future broodstock were selected from progeny of females with spawning dates after January 1. The first females spawned using this selection process were in the 2005/06 spawning season (mid December through mid February). That first year, the number of females that spawned prior to Christmas dropped from 44% the previous spawning season (2004-05) to 19.6%. In the next spawning season, (2006-07) the percentage of pre-Christmas spawners again dropped from 19.6% to 15.3%. Similar results were seen in 2007/08 spawning season.

FRENCH CREEK BROWN TROUT PRODUCTION

Wild (French Creek) brown trout fingerling production is summarized in Table 12.

The request for wild brown trout fingerlings in 2007 was 161,250. In 2007, 164,934 fingerlings were produced (102.2% of the total requested).

Future broodstock are collected annually from French Creek. Adult males and females are collected using electrofishing gear and returned to Manchester Hatchery early in the spawning season. The goal is to collect approximately 150 of each gender. Females ranging in size from 10 to 12 inches are targeted for collection. The presence of a visibly extended oviduct is key in identifying females with the best likelihood of actually spawning once brought to the hatchery.

Females are checked weekly for ripeness throughout the mid October through early December spawning season. Approximately 50 of these newly collected females that produce eggs are retained at the hatchery for the following year's egg production. All remaining fish are returned to French Creek after the spawning season.

Approximately 100 females identified by the above mentioned annual process are held in a culture pond at the hatchery and grown to a larger size (16 to 24 inches). Just prior to the spawning season, this lot of fish is transferred from the holding pond to an adjacent raceway where they are checked for ripeness weekly from October through November. After the spawning season, about 50 females of this lot are retained at the hatchery a second year. The larger females that are not selected for retention are released into Iowa trout streams the following stocking season. This revolving pool of 100 larger females is responsible for over 80% of the total annual brown trout egg production. The remaining eggs come from the smaller, newly captured females.

Table 12. *French Creek brown trout fingerling production.*

Year	Production Goal	# Produced (Stocked by Mgmt.)	% of Goal
1997	4,500	6,848	152.2
1998	7,000	8,900	127.1
1999	9,000	9,316	103.5
2000	25,000	22,080	88.3
2001	31,500	30,274	96.1
2002	32,500	37,180	114.4
2003	48,500	27,650	57.0
2004	139,500	106,200	76.1
2005	152,500	165,064	108.2
2006	152,500	176,526[a]	115.8
2007	161,250	164,934[b]	102.2

[a]An additional 9,576 fingerlings (3.1 avg) were produced above those stocked in 2006. They were transferred to Big Spring on 7/11/06, reared to 7", and returned to Manchester spring of 2007.

[b]175,606 fingerlings were produced. The excess 10,672 fingerlings were used as broodstock forage at the hatchery.

Wild brown trout egg production is summarized in Table 13.

Future broodstock were collected from French Creek on 10/9/07. One hundred sixty females and 150 males were taken to the hatchery and eggs were collected from 108 of the females.

Table 13. *Wild brown trout production for retained females and newly captured females.*

	Retained Female Brown Trout				Newly Captured Females			Total
Year	No. Retained	No. Harvested	No. Spawned	No. Eggs Produced	No. Captured	No. Spawned	No. Eggs Produced	Egg Production
2003	106	76	48	86,450	132	106	48,028	134,478
2004	127	99	70	172,642	140	117	65,587	238,229
2005	129	125	110	216,940	140	79	36,513	253,453
2006	109	100	95	165,689	128	67	25,972	191,661
2007	89	87	82	*	160	108	*	195,075**

*Eggs from newly captured and retained females were pooled into incubation trays.
**33,000 of these eggs were lost as a result of equipment failure.

The holding pond for females retained through the year was drained on 9/27/07 and the 87 females were transferred to raceway 7B. Eggs were collected from 82 of these fish.

Over 195,000 total eggs were produced in 2007. Fertilization, eye-up and hatch are typically very good with this strain of trout. Usually survival exceeds 85% from fertilization to hatch. Mortality from hatch to a 2-inch fingerling is higher than for the domestic strains of rainbow and brook trout we have at Manchester. Presumably, a greater number of these wild brown trout swim-up fry never accept the dry starter diet we are currently feeding. Still, survival typically exceeds 90% from swim-up to 2-inch fingerling.

After fulfilling all the of 2006 2-inch fingerling request, over 9,000 extra fish were still on hand. To determine the possibility and feasibility of future need for a larger fingerling brown trout (>2 inches), it was decided to transport these fish to Big Spring to be test grown for one year. On 7/11/06, 9,576 brown trout with an average length of 3.1 inches were transferred to Big Spring. In April 2007, 6,184 of these fish were returned to Manchester at an average length of 7.25 inches. These larger fingerlings were fin-clipped by fisheries management and hatchery personnel and stocked into local streams in late May 2007.

WILD BROOK TROUT PRODUCTION

Wild brook trout production is summarized in Table 14.

Fisheries personnel collected and fertilized 3,600 eggs from 9 ripe females found at South Pine Creek on 11/1/07. The eggs were brought to the hatchery to incubate. All of the eggs died due to the aforementioned equipment failure.

Table 14. *South Pine brook trout fingerling production.*

Year	Production Goal	No. Produced (Stocked by Mgmt.)	% of Goal
1996	Exp.	160	Exp.
1997	1,500	1,497	99.8
1998	1,750	2,350	134.3
1999	1,500	1,215	81.0
2000	1,500	268	17.9
2001	2,250	3,621	160.9
2002	3,950	2,280	57.7
2003	3,450	3,250	94.2
2004	3,450	1,516	43.9
2005	3,000	400	13.3
2006	4,000	4,000[a]	100.0
2007	7,000	0[b]	0.00
2008	4,000	0	0.0

[a]Produced from eyed eggs (5,000) obtained from Nevin SFH, Wisconsin.
[b]Nevin SFH was not able to supply any of the 8,000 eggs requested.

ANGLER COUNTS OF AREAS STOCKED

The total number of anglers are counted and recorded each time fish are stocked into all trout waters. This data has been collected since 1981 as recommended in a research study conducted by Vaughn Paragamian. This data, as indicated in Paragamian's study, has been used as a valuable tool to determine the annual total requested trout to be stocked into our trout waters. Angler count data collected in 2007 is compiled in Table 15.

Overall, there was very little change in total anglers counted from the previous year (6,631 in 2006 compared to 6,402 in 2007). By far, the highest angler counts occur at Bailey's Ford and Richmond Springs. This can be attributed to stocking both every Saturday from April through Labor Day weekend. Accurate angler counts on Saturday plants at Bailey's Ford are often difficult to make as people are coming and going constantly from campers adjacent to the stream. Often an entourage of onlookers develops as the stream is being stocked. In 2008, the Saturday plants will be expanded until the end of September.

The only other streams to show an increase in anglers counted in 2007 were Little Mill, Little Turkey and the Maquoketa River. All plants on Little Turkey and the Maquoketa River are unannounced and few anglers are ever counted on unannounced plants, so the increase in 2007 is insignificant. The stream with the greatest increase was Little Mill Creek in Jackson County. In 2006, 5 anglers were counted compared to 135 in 2007. In 2006, all 12 plants were unannounced, but in 2007, 13 of the 21 plants were announced on the stocking schedule. This change was made to give Jackson County anglers (many who travel from the Quad Cities) an additional announced trout fishing option when both Brush Creek and Dalton Lake stockings were suspended during the warmer summer months. Besides Big Mill, Little Mill is the only other trout water that far south that

Table 15. *Angler counts at catchable streams stocked by Manchester, April-October 2007. (All plants are announced unless noted.)*

	Month							2006	2007
Stream	April	May	June	July	Aug	Sept	Oct	Totals	Totals
Bailey's Ford	142	262	584	350	277	147	18	1,538	1,780
Bankston	43	49	115	44	60	47	3	426	361
Big Mill Creek	57	77	68	75	71	64	15	498	427
Brush Creek	62	62	58	0	26	57	3	336	268
Dalton Lake	57	57	0	0	15	44	3	260	176
Fountain Springs	78	128	110	145	136	102	8	905	707
Joy Springs	29	61	60	136	29	58	8	434	381
Little Mill Creek[a]	*3*	*2*	*34*	*55*	*38*	*1*	*2*	*5*	*135*
Little Turkey River[b]	*1*	*5*	*1*	*9*	*3*	*5*	*0*	*9*	*24*
Maquoketa River[b]	*3*	*5*	*4*	*3*	*1*	*0*	*3*	*17*	*19*
Richmond Springs	213	271	358	405	216	157	26	1,635	1,646
Swiss Valley	53	120	47	0	22	86	20	406	348
Twin Bridges	23	7	30	29	26	13	2	162	130
Totals	764	1,106	1,469	1,251	920	781	111	6,631	6,402

[a]June, July and August plants are announced. The other months' plants are unannounced.
[b]All plants are unannounced.

stays cold enough for trout throughout the summer. The dramatic response on Little Mill may be in part attributed to a shift of anglers from Big to Little Mill. Big Mill counts were down 71 anglers in 2007 and all announced plants on Little Mill (except for one) were made on the same day as the announced Big Mill plant; however, there was a net gain of 53 angler trips to the two areas combined in 2007.

Total anglers counted on Fountain Springs dropped again from 905 in 2006 to 707 in 2007. To explain this, one has to look at the change in stocking procedures on not only Fountain Springs, but nearby Twin Bridges. Both streams are publicly-owned and are maintained by the Delaware County Conservation Board.

Prior to 2006, Fountain Springs had received two announced plants/week through Labor Day weekend. During this time, total anglers counted were typically well over 1,000 annually. The average yearly count from 2001 through 2005 was 1,306 anglers with a high count of 1,669 anglers in 2005. Starting in 2006, one of the two weekly plants was switched to an unannounced stocking. This was usually the first plant of the week. So, rather than two weekly announced plants of approximately 300 trout/plant, it was stocked with 200 trout on the unannounced plant and 400 trout on the announced plant. Concurrently with this change at Fountain Springs, nearby Twin Bridges (less than 2 miles from Fountain Springs) was changed from an unannounced twice/month plant to an announced plant once/week. These changes were made in an effort to shift some of the angling pressure from Fountain Springs to Twin Bridges. In addition to decreasing the fishing pressure on Fountain springs, a second goal was to provide better trout angling on weekends and on days in between plants. The change in angler counts at Twin Bridges has been less dramatic. In the two years prior (2004-05), under the twice/month unannounced stocking regime, 109 and 88 anglers were counted. During the past two years (2006-07) of once/week announced plants, annual angler counts have gone up to 162 and 130 anglers respectively.

Although a modest shift in angler pressure from Fountain Springs to Twin Bridges appeared to occur, combining annual anglers counts of the two areas and comparing the two years since the change in stocking regime, finds a net loss of 1,263 anglers counted. As stated, it is well documented that very few trout anglers are seen (counted) on an unannounced trout stream plant verses the numbers seen at streams during an announced plant. Combined, the 2006 and 2007 angler counts indicated that in 45 unannounced plants, an average of 3.0 anglers were counted per plant; whereas, an average of 28.4 anglers/plant were counted on the 52 announced plants in the same two years. The total number of trout stocked in the two areas combined has not changed since the 2006 change in stocking procedure. Considering this, the drop in anglers seen should not be of a great concern if the goal of improved angling between plants is realized without a reduction in trout stamp (fee) sales. To properly analyze the impact on angling pressure, one would have needed to conduct a creel survey of the two areas. The changes have generated no angler complaints to our knowledge and few comments. In 2008, the current stocking regime will be continued on both Fountain Springs and Twin Bridges.

It should be noted that a flood on the above two areas occurred late in the 2007 stocking season (10/07/07). The flood destroyed the road through Fountain Springs Park and, thus, the majority of the easiest angler

access will be lost until the road is repaired. Currently, Delaware County Secondary Road Department does not have set plans for this repair work. It is expected that this will affect the angler usage of Fountain Springs and Twin Bridges. Access was unchanged by the flood at Twin Bridges. The number of fish requested in 2008 was unchanged, but may be adjusted during the 2008 stocking season if needed.

MAJOR PROJECTS

April/June – Constructed new parking lot kiosk. This was an Eagle Scout project for Matt Sullivan, Troup 34.

May/June – Four new stalls were added to the Law Enforcement building in the bone yard.

July/August – Installed four new windows in east residence and one in west residence.

September – Installed new overhead door in feed storage building.

October – Flood on Sunday, 10/7/07. Over four inches of rain fell in less than one hour causing the second highest water on Spring Branch Creek since 1976 when the office was moved from Backbone to the Manchester Hatchery. High water caused major damage to the universally-accessible fishing area. No fish losses occurred.

November – Installed 900 gallon LOX bulk tank from Rathbun Hatchery and transferred 1,500 gallon tank to Decorah Hatchery

2007

PRODUCTION REPORT

FAIRPORT FISH HATCHERY

Ken Snyder	**Natural Resources Biologist**
Melanie Harkness	**Natural Resources Technician 2**
Eric Giebelstein	**Natural Resources Aide**
Ryan Friederich	**Natural Resources Aide**
J.J. Moser	**Natural Resources Aide**

Ken Snyder, Hatchery Manager
Fairport, Iowa

INTRODUCTION

Fairport Fish Hatchery is a warmwater, extensive culture station located on the Mississippi River near Muscatine. Water supply for the 18 earthen ponds totaling 16.8 acres is the Mississippi River.

In 2007, Fairport produced largemouth bass, walleye, bluegills, and white amur (grass carp). Fairport also administers the statewide farm pond stocking program. Fish production assigned and percentage of production accomplished are listed in Table 16.

WALLEYE PRODUCTION

Production Techniques
Fry Production

APHIS has implemented regulations restricting export of certain fish from states bordering the Great Lakes to try to limit the spread of VHS. Walleye are on that list and we normally get our eggs and fry from Genoa National Fish Hatchery in Wisconsin. We also have had problems with survival of eggs and fry obtained from Genoa. For these reasons, we decided to try to spawn river strain walleye at Fairport using Human Chorionic Gonadatropin.

In the fall of 2006, we obtained 36 walleye from the Mississippi River by electro-shocking below Lock and Dam 15 and held them in pond 36. In late March, we obtained another 47 fish by electro-shocking again below Lock and Dam 15 on the Mississippi.

In late March, the winter holding pond was drained. All the fish were placed in raceways in the holding house and sorted by sex and maturity. We ended up with 47 males and 26 females. The females were equally divided into two groups. The HCG injection protocol calls for two injections 2 days apart. The first injection was 150 IU/kg and the second was 500 IU/kg. The first group's injections were started on March 28 and the second group was started on March 30. Due to low milt production, the males were also injected with 150 IU/kg.

Females started spawning on April 1 and continued until April 5. All but two females spawned. Early in the spawning season, the females were only checked once a day. Some of the females released their eggs in the raceways so after the second day of spawning the females were checked twice a day. Eggs were stripped into a pan and fertilized with milt from at least two males. The fertilizing process and eggs were handled using the protocol developed by the Rathbun Fish Culture Research Station. After water hardening, the eggs were bagged and sent to Rathbun Hatchery for hatching. A total of 12

Table 16. *2007 Production quotas and percent accomplished.*

Species	Size	Assigned Production	Percent Production Attained
Largemouth Bass	1.5 inches	211,350	181.7
Bluegill	1 inch	1,058,000	138.7
Walleye	2 inches	530,630	74.9
White Amur	8-10 inches	15	900.0

quarts were sent to Rathbun. Table 17 details the results of the walleye spawning.

Table 17. *Walleye spawning results.*

Females injected	26
Females spawned	24
Quarts of eggs	12
Number of eggs	1,620,000
Percent hatch	72.5 %
Number of fry	1,174,500

Production Techniques
Fingerling Production

A total of 11.74 acres in 10 ponds was used to raise walleye in 2007. All upper pond filling and four of the lower ponds were started 1 to 4 days prior to stocking.

One lower pond (28) was filled according to the recommendations suggested in a Master's thesis by Melanie Harkness. This pond was kept full all winter but was allowed to drain down to approximately ½ full in the spring. Then it was filled at the same time as the rest of the ponds. This was done to control clam shrimp but still create a plankton bloom.

After the walleye eggs were taken, we had cooler weather and water temperatures decreased at Rathbun Fish Hatchery, which caused the eggs to hatch much later than expected. Genoa NFH uses well water to incubate their eggs so eyed eggs were available from them almost a week before any eggs had hatched at Rathbun even though the walleye at Genoa were spawned a week later. The VHS rules adopted by APHIS allow the export of eggs from states bordering the Great Lakes. We needed to stock our ponds as early as possible so that we have enough room for largemouth bass rearing later. Consequently, only two ponds were stocked with fry from Rathbun and the rest were stocked with fry from eggs obtained from Genoa NFH.

Eyed walleye eggs were obtained on April 20 (387,000) and on April 27 (849,000) from Genoa NFH and hatched at Fairport. The eggs obtained on April 27 had a very poor hatch.

Fry from Rathbun were hauled loose in partially filled fish hauling tanks. If necessary, the fry in the tanks were tempered by adding water to the tanks and then the tank water and fish were tubed into the pond. Eggs from Genoa were hauled in a bag with water and oxygen and transferred to McDonald jars for hatching.

Fry were stocked at rates of 65,000 to 150,000 per acre and samples were taken from each shipment and held in buckets for 24 hours at the ponds to check for delayed mortality.

Dissolved oxygen was measured every day. Two hundred pounds per acre of alfalfa meal was added to the ponds as they filled. At 1-week intervals, up to 100 lbs per acre of alfalfa meal was added to all ponds if DO levels were above 3 ppm on the bottom.

Ponds were sampled every week for total nitrogen and phosphorus. If nutrient levels were low, inorganic fertilizer was added to bring nitrogen levels to 1200 ppb and phosphorus levels to 60 ppb. If nutrients were higher than target levels, then no fertilizer was added.

Filamentous algae was spot treated with herbicides. If needed, predatory aquatic

insects were treated with 6 gallons of vegetable oil per acre. This treatment was not used until at least 5 days post stocking so as not to interfere with gas bladder inflation.

Water was flushed through the ponds if DO's dropped below 2 ppm on the bottom. Fish were sampled in each pond approximately 21 days post stocking to determine growth and survival. Periodic plankton samples were taken to monitor food availability. Ponds were drained 31 to 40 days after stocking.

Production Results and Cost

Production varied greatly between ponds and source of fry. Ponds stocked with fry obtained from Rathbun on April 27 had an average return of 74.2% compared to fry hatched from eggs obtained from Genoa, which had an average return of 12.8%. This seems to indicate a problem with Genoa eggs or our hatching process.

In 2008, we will be looking at other options and procedures to try to increase survival in our rearing ponds. We will spawn walleye here again, send eggs to Rathbun, and keep some to hatch at Fairport. We will make some changes to improve our hatching process here. If needed we will still obtain eggs from Genoa NFH.

Table 18. *Walleye production and cost.*

Fry stocked	1,763,750
Number returned	397,765
% return	22.6
Total pounds produced	365.6
Average # / lb.	1,088
Total production cost	$13,730
Cost per 1,000	$34.52

Overall production was insufficient to meet requests. Table 18 details walleye production results and costs.

LARGEMOUTH BASS FINGERLING PRODUCTION

Production Techniques

Largemouth bass were produced at Fairport using pond spawning and rearing. The overwintering pond was drained on April 25, prior to the spawning season to prevent any early spawning. The fish were sexed and placed in separate ponds (36 and 37) which allowed us to spawn them later, when rearing ponds were available after walleye season. We had 312 available for spawning and all the brood stock were in good condition.

Ponds for spawning and rearing largemouth bass were not available until after May 15. On May 14 and 15, the holding ponds were drained and 121 pairs of the best males and females were stocked into ponds 35 and 37. Fish were stocked at 70 pair per acre in 1.67 acres of water. Extra fish not used were stocked into pond 36.

The male bass began nesting immediately and eggs and fry were observed on nests within a week of stocking. We collected fry three ways at Fairport. Swim up fry were collected using a small round keep on the nest to corral them and also using a short seine as they swam up from the nests. This was done on May 24. Older fry were harvested with a seine on June 1, 2 and 4; and on June 6 when the ponds were drained.

After the spawning season, the broodstock were examined and fish over 5 years old or in poor condition were removed. The remaining fish were stocked into pond 37 and fed fathead minnows from a commercial source and goldfish reared at Fairport.

To replace the culled broodstock and any mortality, 250 fingerlings from our regular production were stocked in pond 28C and fed fathead minnows. To keep track of the age of all the broodstock, each year class has been given a different fin clip.

Production ponds were started 2 to 6 days prior to being stocked and all ponds were full within 4 days of being started. Five ponds with a total of 8.3 acres were used for fingerling production.

A variable stocking rate from 56,000 to 100,000/acre was necessary to match similar sized fry together. Ponds were stocked with fry on May 24 and June 1, 2, 4 and 6.

Rearing ponds were fertilized with 100 lb. /acre of alfalfa meal at filling. Nutrient levels were monitored and nitrogen and phosphorus fertilizers were added to maintain levels of 1200 ppb total nitrogen and 60 ppb total phosphorus. This was done weekly if time and personnel were available.

Ponds were sampled 1 week after stocking to determine growth and survival. Ponds were spot treated with herbicide to control filamentous algae. Ponds with high numbers of predatory insects were treated with vegetable oil at 6 gallons per acre. All ponds were harvested between 12 to 23 days after stocking.

Production Results and Cost

A total of 770,297 fry were harvested from the spawning ponds. Of these 75,000 at 350/gram were taken directly from nests. The rest, 695,297, which were taken later, ranged from 5000 to 21,000 per pound. Average number per female was 4500. The production ponds were stocked with 473,350 fry. Excess fry production, 296,947 was stocked directly into some state waters or traded to a private hatchery for other fish.

The production ponds yielded 384,052 fingerlings with a return ranging from 25.1% to 103.4% of fry stocked. The overall return was 55.0%. The return from the fry harvested from the nests was 103.4%, which means we underestimated the number stocked. Table 19 details bass fingerling production and cost.

BLUEGILL PRODUCTION

Production Techniques

Table 19. *Largemouth bass fingerling production and cost.*

Fry produced at Fairport	770,297
Fry produced per female	4,500
Fry stocked	473,350
Fingerlings produced	384,052
% return	69.7
Average # per lb.	660
Total pounds produced	581.8
Total production cost	$23,509.65
Cost per 1,000	$61.21

Adult bluegills from 2006 ponds were held over winter in pond 38. Bluegill ponds were filled as ponds became available after walleye and bass production. All ponds were started between May 30 and June 27. Seven ponds with a total of 9.36 acres were used for production. The overwintering pond was drained on June 28 and 1003 adults were stocked into the production ponds. This was not enough to satisfy our needs of 70 pairs of fish per acre so more adults were collected from public waters by fish management crews, transported to the hatchery, and stocked into production ponds. All ponds were stocked with the correct number of brood stock by July 15.

Few amurs were available for stocking to control vegetation so herbicides were used in most ponds to control vegetation.

All the ponds were drained in late September and October. Adults were collected and stocked into pond 39 to hold overwinter.

Production Results and Cost

Fall bluegill production was good this season with 1,467,135 produced with an average of 156,745 fish per acre. Table 20 reports production and costs for bluegills.

Table 20. *Bluegill fry production and cost.*

Fry / acre	156,745
Fry / female	2,190
Total Fairport fry	1,467,135
Total pounds produced	785.1
Average #/lb.	1,868
Total production cost	$13,344.61

WHITE AMUR PRODUCTION

Production Techniques

Excess 2006 eight-inch white amur production was overwintered in pond 36. In addition, 321 smaller white amurs had been stocked into pond 37, which was the LMB overwintering pond. On March 28, pond 36 was drained and 99 white amurs were removed. There were no amurs in pond 37 when it was drained in April 2007. There were no requests for white amur in 2007 so the fish overwintered were euthanized and buried.

On July 17, 5,000 white amur fry were obtained from Arkansas and stocked into pond 26. Plankton production was poor so very few survived. Pond 26 was drained on September 6 and only 19 fingerlings were removed. They were stocked into the bluegill pond 27.

Pond 27 was drained on October 16 and 17 white Amur were harvested. All 17 were used in state stocking.

Production Results and Cost

Production of 8 inch or larger white amurs was 116 fish. Requests for white amur has steadily declined over the years, therefore we will continue to raise fewer fish than in the past. Table 21 lists results and costs for white amur production.

Table 21. *White Amur production and cost.*	
Overwinter	99
Number fry stocked in rearing pond	5000
Number fingerlings returned	19
% returned	0.4
Number fingerlings stocked in rearing ponds	19
Number returned	17
% return	89.7
Total 8 inch + fish produced	116
Total pounds	38.7
# overwintering	0
Total production cost	$346.82
Cost per 1000	$2989.83

NORTHERN PIKE PRODUCTION

Production Techniques

The Illinois DNR at the Jake Wolf Fish Hatchery notified us in late May that they may have up to 25,000 northern pike available.

Production Results and Cost

On May 31, 25,550 northern pike at 46 per pound were picked up at the Jake Wolf Fish Hatchery and delivered to the waters of the State of Iowa. Table 22 lists production and costs associated with northern pike.

Table 22. *Northern Pike production and cost.*	
Fingerlings received from IL	25,550
Number / lb.	46
Total pounds	555
Total delivery cost	$1,219.87
Cost per 1,000	$47.77

GOLDFISH PRODUCTION

Production Techniques

The cost of buying minnows has been going up every year. In the past, Fairport has raised goldfish as food for largemouth broodstock. This was successful in 2006 with 855 lbs of goldfish raised using only one pond and with very little effort.

On March 28, pond 36 was drained and 318 goldfish were removed. These were stocked into ponds 25 (.5 acres) and 29 (.31 acres). Pond 25 received 256 adults and pond 29 received 62. They were fed old catfish feed ad libitum. When small goldfish were observed smaller feed was mixed in with larger feed when the fish were fed.

Pond 25 was partially drained on July 16 & 27 and August 17 and some of the young goldfish were removed. The pond was completely drained on August 22. Pond 29 was partially drained on July 9 and August 7 and completely drained on September 6. All but a few larger fingerlings, which were kept as future brood stock, were fed to the broodstock largemouth bass.

One hundred and fifty large goldfish and fifty smaller ones were stocked into pond 38 to hold over winter.

Production Results and Cost

Raising goldfish this year was even more successful than in 2006. We were able to raise 1470 lbs of goldfish to feed to our bass. This was almost double

what we raised last year. Cost per lb was only $0.63 compared to about $1.19 per pound for minnows. We will continue this in 2008. Table 23 details goldfish production.

Table 23. *Goldfish production and cost.*

Total lbs. produced	1,470
Total production cost	927.83
Cost per lb.	$0.63

KOI CARP PRODUCTION

Production Techniques

At the 2007 Warmwater Fish Culture Workshop in Kansas City, we had a discussion with the staff from the A.E. Wood Fish Hatchery in Texas about forage for largemouth bass. They said they have had good results using koi carp. They spawn koi several times each summer and said that they would gladly send us some.

We requested that they send us 100,000 fry in June. On June 19, they sent us 100,000 fry in two boxes. On June 20, we received one box containing 50,000 fry and they were stocked into pond 39, 1.08 acres. The second box of fry was never found. The fish were monitored and when they were large enough to take catfish feed they were given a supplemental feeding each day.

The pond was drained on July 27 and the koi removed. At this time, it was discovered that there were 21 young of the year largemouth bass in the pond. They were in excellent condition. Thirty-eight of the koi were stocked into pond 38 to be held overwinter. We will be using these fish as broodstock to try to raise our own koi in the future. The rest of production was fed to the largemouth bass.

Production Results and Cost

We did not have very good production of koi this year, with only 93 lbs. raised. We will try again in 2008 by either trying to spawn fish that we kept back or obtaining more fry from Texas. Table 24 details koi production.

Table 24. *Koi carp production and cost.*

Fry received from Texas	50,000
Total lbs. produced	93
Total production cost	$487.57
Cost per lb.	$5.24

FARM POND STOCKING

Fairport Fish Hatchery administers the statewide farm pond-stocking program. The program was changed in 2005. Pond owners are now charged a fee of $25.00 per acre and the owners must apply through one of the four fisheries district offices. Each pond must still meet the same guidelines: at least 8 feet deep, at least .5 acres, must be fenced to exclude livestock or no livestock present, must have a buffer strip planted around pond and must be free of fish. All applications must also be approved by an Iowa DNR official. All farm pond data is entered by secretaries at the district offices and then forwarded to Fairport.

Each applicant is sent a notice at least 10 days before delivery of fish explaining when and where fish may be picked up. Farm pond numbers were up about one hundred twenty applicants over 2006, which is still down from the average for years before a fee was charged. Results of the farm pond stocking are listed in Table 25.

Table 25. *Farm pond stocking.*

	Pond applications	No shows &cancels	Postponements to next year	Counties	Total acres stocked	Average pond size
Summer 2007 Bass stocking	263	7	1	72	606.9	2.38
Fall 2007 Bluegill & catfish	381	2	3	78	819.7	2.18

2007

PRODUCTION REPORT

GUTTENBERG HATCHERY

Scott Gritters	**Natural Resource Biologist**
Kevin Hanson	**Natural Resource Technician 2**
Tina Bodensteiner	**Natural Resource Aide**
Patrick Henry	**Natural Resource Aide**

Scott Gritters, Project Leader
Guttenberg, Iowa

INTRODUCTION

The 2007 season marked the 33rd year of the Iowa Department of Natural Resources (Iowa DNR) northern pike (*Esox lucius*) netting operations at Guttenberg, Iowa. The netting season seemed typical with operations beginning in late March to early April, as soon as the ice began to break up in the backwater lakes. In early spring, pike naturally begin seeking the submerged vegetation upon which to lay their eggs. Fisheries staff from Guttenberg, Bellevue, Decorah, Manchester and Fairport partner to collect brood northern pike using fyke nets set in shallow backwater habitat of pools 10 and 11 of the Mississippi River. Netting begins when main river water temperatures reach 40° F and backwaters are mostly free of ice. Crews transport collected pike to the Guttenberg hatchery where the culture takes place. Statewide stocking requests from fisheries management biologists have decreased in recent years to less than one million fry.

METHODS

The hatchery contains four broodstock holding-tanks and two incubators. A 100 ft. deep cased well provides water to the incubators at 240 gpm via a 5-hp submersible pump. The dissolved oxygen (DO) in the subterranean water ranges from three to four mg/liter and maintains constant temperature of 53° F. DO concentrations are artificially maintained between seven and ten mg/liter using liquid oxygen injection.

Ripe male and female pike are individually anesthetized using electronarcosis before the spawning begins. Electro-narcosis was adapted for anesthesia in 1993. Previously, Iowa DNR staff used tricaine methanesulfonate (MS 222), but this was discontinued in 1993. A battery powered Coffelt Model BP-4 electro-fishing unit emits 200 watts (two amperages and 100 volts) at a 60% duty cycle. Pike are shocked for five to seven seconds. Both male and female northern pike remain under electro-narcosis for up to five minutes, which is an ideal time to allow for stripping operations. Aluminum cathodes and anodes are installed at each end of a 1.5 by 0.5 by 0.5-meter fiberglass tub. Pike are shielded from direct contact of the electrodes with Plexiglas shields. Narcosis takes place instantly with little or no thrashing about to injure the fish. Zero instantaneous mortality of pike was observed due to electronarcosis.

Eggs from 1 to 4 female pike are stripped into a liter pan. Sperm from 3 to 5 males fertilizes the 0.5 to 1.0 liters of eggs. Finally, 10% saltwater is poured on the eggs and fertilization progresses. Semen extender was successfully tested on northern pike eggs for the first time in 2003 but was not utilized in 2007.

The hatchery adopted a modified dry pan fertilizing method in 1993, developed by Richard Schact, Hatchery Biologist, U.S.F.W.S., National Fish Hatchery, Genoa, Wisconsin. Essentially, the method eliminates the water hardening process. Previously, a wet pan method was utilized at Guttenberg and average sac fry survival has since increased from 15-25 percent to 85-95 percent.

Approximately, 60 females and 180 males produce one million fertile eggs. In some years, unripe females are injected with a solution of distilled water and common carp pituitary (CCP) at a rate of five mg/kg of body weight to induce ovulation. The solution is a mixture of one gram of finely ground carp pituitary per one liter of distilled water. CCP injections at times

have helped to induce sperm releases, however, in 2006; no pituitary was needed on pike as spawning quotas were reached. The use of carp pituitary will be discontinued at the Guttenberg Hatchery.

After the eggs and sperm are mixed together, the sperm are activated with about 50 ml of ten-percent salt solution. Then 53° F well water is added to the egg mass and they are gently stirred. The eggs sit motionless for about two minutes while fertilization occurs. A hatchery jar is half-filled with well water, and then several pans of eggs are combined into hatching jars to capacities of 2 liters of eggs per jar, or approximately 130,000 eggs per jar. Egg counts range from 65,000 to 70,000 northern pike eggs per liter.

The Schacht method greatly improves egg-handling efficiency. The old water hardening process involving many pans of eggs and much time spent cleaning the eggs of foreign material. With the Schacht method, the egg mass is not cleaned of blood, slime, excess sperm or fecal materials. Immediately following fertilization, the eggs are placed into hatching jars. They are transferred to the incubator where a shad tube is inserted to provide constant water flows. Individual water valves calibrate water flow rapidly at three gpm, breaking tissues apart and ridding the eggs of foreign materials and dead sperm. The first day the eggs begin to absorb water and mitosis begins the incubation process. Water flows then are reduced to 2-gpm. Eggs gently rotate in the water column and are undisturbed until day four and five when eye-up occurs. Siphoning of dead eggs and cleaning dead sperm begins, and it continues daily until the eggs have hatched on the eighth and ninth day. Siphoning also removes the hatched eggshells from the emerging fry. If sac fry survival rates are high, fry are divided into empty jars to prevent overflow of fry as they attempt to swim up and fill their air bladders.

In 2002, verification of the virus carp viremia was documented in the Mississippi River. This raised concern over the remote possibility of spreading the disease with hatchery stocked northern pike (Susan Marquenkski, Wisconsin DNR pers. com). Carp viremia affects many cyprinid and catostomid species and may potentially affect northern pike. In 2003, crews collected brood northern pike for testing of the virus. Staff also conducted egg disinfection tests to monitor our ability to contain diseases, if needed. The Food and Drug Administration, allows the use of iodine as a fish egg disinfectant at rates of 50 mg/L A.I. for thirty minutes during water hardening and 100-mg/L A.I. solutions for ten minutes after water hardening. Treatment within five days of hatching is not recommended as premature hatch can increase mortality. Egg disinfection was experimented on 15,000 eggs using Argentyne, a buffered iodine solution. Argentyne contains 1.0 percent (10,000 ppm) available iodine. A 1:100 dilution of Argentyne was administered by adding (38 milliliters) 1.28 fluid ounces to one gallon of water. The eggs were removed from the incubator battery and circulated in the solution with a small air-stone for ten minutes. The eggs were then returned to the incubator battery and flushed with clean water. In 2003, collected brood stock pike were found to not carry carp viremia and the disinfections of eggs was not again tested in 2007.

Hatchery personnel stock the sac fry to receiving waters before the 14th day to prevent the absorption of the egg sac. Combining multiple lots when possible, fry

are distributed from the 11th through 13th day, packaged into water and oxygen filled plastic bags and placed in 14-inch square cardboard boxes. The bags are of durable 12-mil plastic and constructed with square bottoms. Each bag holds about twelve liters of water and eighteen liters of oxygen. The fry are measured by a water displacement method to approximate 50,000 sac fry per bag.

RESULTS

Six test nets were set out on 22 March, 2007 when the water temperature reached 42° F. Additional nets were set the following days with 12 to 20 nets run daily. Water levels and temperatures rose steadily throughout the spawning period. Final nets were pulled on 29 March 2007. Water temperature on the last day was 50° F.

Catch per unit of effort (CPUE) was 4.83 pike per net day, well above the 32-year average CPUE of 2.4-fish/net day (Figure 1). All fish netted came from Goetz Lake, Swift and Dead Slough in Pool 11 and Johnson Lake in Pool 10.

From the netting effort, 210 females and 287 males were brought to the hatchery for spawning. Eighty-two females produced thirty-six liters (2,340,000) of eggs. Around 128 additional females captured in nets were held in the hatchery and checked daily for "ripeness" (flowing eggs) with little success. These fish were released back to the River without ever spawning in the hatchery.

Although initial fertilization of eggs seemed successful, the hatching success was well below recent averages. The hatching percentage for 2007 was a meager 10.5% whereas typical hatching rates are near 65%.

Guttenberg staff distributed the sac fry to waters statewide. On 5 April 2007, the first shipment of 50,000 fry to Worth County was completed. All pike shipments were delivered in two days (Table 26).

Table 26. *Waters receiving northern pike fry from the Guttenberg Fish Hatchery in 2007.*

Receiving water	**County**	**No. of Fry**
Cedar River Pond	Mitchell	10,000
Green Island	Jackson	42,000
Guttenberg Ponds	Clayton	4,000
Pool 11 at Guttenberg	Clayton	5,000
Pool 13 at Browns Lake	Jackson	34,000
Rock Creek Wetlands	Clinton	15,000
Salyorville Pond	Polk	85,000
Worth County	Worth	50,000
Total		**245,000**

DISCUSSION

The Guttenberg hatchery has experienced a decline in the egg hatching success in the past few years, which may be cause for concern. As stated before, the hatching percentage for 2007 was 10.5 %. Hatching success for the previous six years, going back to 2002, have been: 12%, 53%, 65%, 32% and 72%. Specific problems at Guttenberg, which could have affected survival, include oxygen level fluctuations and nitrogen super saturation. This facility has a 100 ft deep well and oxygen is injected into the water line above the pump. In 2006 and 2007, oxygen fluctuations occurred daily and ranged from two mg/l to as high as 20 mg/l. It is not known if this was due to problems with the oxygen injection system or due to problems with gas super saturation related to nitrogen from the well water. Saturometer readings were not taken in 2007. Past years averaged 105% nitrogen

saturation. Higher readings occurred if DO levels dropped below eight mg/l. Gas bubbles were observed on fry in 2007 but it is not known whether these were nitrogen or oxygen or whether they affected mortality.

Some possible items to address to attempt to once again reach historic hatching success are:

1. Measure saturometer readings daily to determine if gas saturation is affecting fry survival.
2. Run entire water system on separate pump, which is used to supply water to our public aquarium system. This pump is smaller, may use less oxygen pumped and may be more controllable.
3. Have oxygen system with stones delivered directly into the head tank above to directly inject oxygen in the head box and not in the well lines.
4. Securing a new oxygen regulator and determine if oxygen flow is being delivered to the wellhead in correct amount.

Over the past thirty-three years, Iowa DNR crews have been inventive and adaptable in improving the spawning of northern pike. In 1993, the hatchery adopted a modified dry pan, developed by Richard Schact, Hatchery Biologist, U.S.F.W.S., National Fish Hatchery, Genoa, Wisconsin. This adaptation improved the average sac fry survival from 15-25 percent to 85-95 percent. Around the same time period, hatchery personnel began to successfully utilize electronarcosis as a method for anesthesia greatly aiding in the proper safe handling of northern pike. In 2000 through 2002, Saturometers were used to determine that levels of trapped air gasses in well water were excessive. In 2003, crews tested the use of Argentyne, an iodine based chemical to disinfect eggs. The disinfectant appeared to be successful but did lower hatch success rates. Also netting crews assisted personnel with the Wisconsin DNR, USFWS Fish Health Lab and others in the testing of brood northern pike for carp viremia. Fortunately, the viremia was not found in wild northern pike stocks. Finally, in 2003, Iowa DNR personnel successfully tested the use of extenders in holding pike seamen for extended periods.

Despite our best efforts to pinpoint the cause of poor hatch success and implement measures to prevent mortality, the problems may stem from environmental factors, which are beyond our control. Many hatcheries in the upper Midwest region have documented that northern pike hatching success can fluctuate dramatically from year to year and the reasons are not quite clear. The Spirit Lake Hatchery in Iowa also struggled with hatch success for pike in 2007. The Genoa National Fish Hatchery in Wisconsin (which also hatches northern pike taken from the Mississippi River) has traditionally had low hatch success even in years when Guttenberg has had high hatch rates. There may be climatic or water quality changes or factors about northern pike physiology or unknown habitat requirements which are important for spawning success.

Spawning behavior in northern pike appears to be triggered almost solely by water temperature. In mid March of 2007 water temperatures rose quickly to nearly 40 degrees, which is near the temperatures where northern pike spawn in the Mississippi River. The 2007 netting of broodstock began on March 23, which is near the average start date for the 33- year hatchery history. Water temperatures and water levels rose rapidly throughout the spawning season making for a relatively short netting period. Unseasonable early warm temperatures in the past have triggered spawning events as early as March 1. The

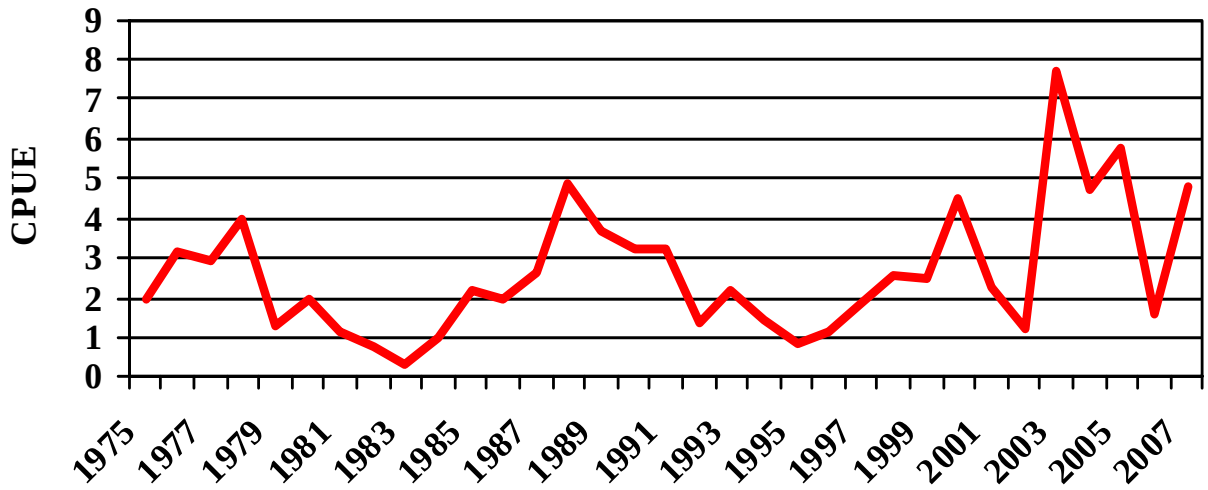
latest pike spawns have been in the second week of April.

The 33-years of Guttenberg pike culture gives management staff a rare long-term data set of northern pike populations in the Mississippi River. Trends in CPUE tend to cycle having peaks and valleys occurring at ten-year intervals. Catch rates ranged from a low of 0.3 in 1983 to a high of 7.8 in 2003 (Figure 2). An above normal catch rate of 4.8 fish per net was experienced in 2007. Usually high catch rate corresponds with higher water levels in the Mississippi River. Conversely, low catch rates usually correspond with years of low water levels.

Loss of critical backwater habitat on the Mississippi is still occurring and netting crews have altered netting locations as the habitat has degraded. The present day netting sites remain only in a few high quality backwaters. These include the Swift Slough and Goetz Lake complex in Pool 11 and the Sny Magill complex and Bussey Lake in Pool 10. Numerous backwaters have reduced pike populations due to loss of habitat. These include the Bluff Slough and Spring Lake complex in Pool 11 and the Frenchtown complex in Pool 10.

The need for habitat rehabilitation and enhancement projects (HREP) along the Mississippi River to enhance pike populations is evident. Many projects are compatible with moist soil waterfowl management and could accomplish both interests. Conservation practices such as wetlands development and buffer strips could maintain pike populations in interior Iowa Rivers. If wetlands have connectivity to streams, natural pike spawning is possible, reducing our need for cultured pike.

Figure 2. Catch per net of northern pike at Guttenberg from 1975 to 2007.



2007

PRODUCTION REPORT

MOUNT AYR HATCHERY

Gary Sobotka — **Natural Resource Biologist**
Dray Walter — **Natural Resource Technician 2**

Gary Sobotka, Hatchery Manager
Mount Ayr, Iowa

INTRODUCTION

The Mount Ayr Fish Hatchery is a warm water rearing facility consisting of 6.35 acres of water in eight earthen ponds. The city owned lake, Loch Ayr, is the sole water source for the hatchery. Only the largest six ponds were used for fish production during the 2007 season. The smallest two ponds were used as an area to propagate desirable native aquatic plants for transplanting into area lakes.

Fish production in 2007 consisted of overwintering bluegill, redear, channel catfish, and largemouth bass as part of 2006 production, rearing hybrid striped bass (wipers), from fry to fingerlings, and rearing largemouth bass from fingerlings to advanced fingerlings. Production assignments and percent attained are listed in Table 27.

Table 27. *2007 production, assignments, and percent attained.*

SPECIES	SIZE	REQUESTED PRODUCTION	PERCENT ATTAINED
Over-winter 2006 BLG	50 mm	270,472	100
Over-winter 2006 CCF	200 mm	1,186	100
Over-winter 2006 RES	50 mm	12,000	100
Over-winter 2006 LMB	100 mm	3,302	100
Wipers	60 mm	12,475	18
Largemouth Bass	100 mm	12,010	100

Fisheries Management personnel at the Mount Ayr facility operated the hatchery. Staff from the Cold Springs Fisheries Office, Rathbun Hatchery, and Spirit Lake Hatchery assisted with fish harvest and or transportation activities.

BLUEGILL OVERWINTERING

Production Techniques

Hatchery Ponds 1 and 3, consisting of 2.55 acres were filled on June 23, 2006. Two cages 4' wide by 4' tall by 6' long were placed in water 3.5 feet deep and stocked with 6 bluegill pairs each. All brood stock were 8 inches or greater in length. Two, 18-inch diameter spawning pans filled with pea gravel were placed in each cage. Bluegill fry were detected 41 days later. Cages and breeding pairs were then removed. No additional fertilizers were added but ¼ acre spot treatments of copper sulfate were made to control filamentous algae. Water levels during the winter months were maintained within one foot of full. No other inputs were given to the project.

Production Results and Cost

The ponds were drained on March 21, 2007 and 270,472 fish averaging 1.5 inches long were harvested and stocked into Blue Lake (Monona County) and Viking Lake (Fremont County). A summary of production and cost is given in Table 28.

Table 28. *Bluegill overwintering production and cost.*

Number spring harvested	270,472
Mean harvested length (mm)	27
Percent request filled	100
$2690.00 (total production cost)	
270,472 (total number produced) = $9.96/1,000 fish	

LARGEMOUTH BASS OVERWINTERING

Production Techniques

Hatchery Ponds 6 and 8, consisting of 1.64 acres were filled on June 23, 2006. Eight pairs of adult bluegills were allowed to spawn freely in the ponds. Six thousand largemouth bass fingerlings measuring 1.5 inches were added on June 27. No additional fertilizers were added but ¼ acre spot treatments of copper sulfate were made to control filamentous algae. Water levels during the winter months were maintained within one foot of full. No other inputs were given to the project.

Production Results and Cost

The ponds were drained on March 23, 2007 and 3,302 largemouth bass at 52/pound were stocked into Badger Creek Lake (Madison County), Viking Lake (Fremont County), Cold Springs Lake (Cass County), Thayer Lake (Union County), Nine Eagles Lake (Decatur County), and the Zimmerman Wetland above Lake Icaria (Adams County). A summary of production and cost is given in Table 29.

Table 29. *Largemouth bass overwintering production and cost.*

Number spring harvested	3,302
Mean harvested length (mm)	95
Percent request filled	100
$1860.00 (total production cost)	
3,302 (total number produced) = $563.20/1,000 fish	

CHANNEL CATFISH OVERWINTERING

The Rathbun Fish Hatchery delivered and stocked 1200 channel catfish averaging 8 inches in length into Pond 8 on October 27, 2006. The largemouth bass and bluegill produced during the 06 production season were to be held over-wintered and stocked into Viking Lake (Fremont County) during the spring of 2007. Water levels were maintained within one foot of full during the winter. No other inputs were given to the project.

Production Results and Cost

The pond was drained on March 23, 2007 and all fish were inventoried. The catfish numbered 1186 and were transported to the lake. A summary of production and cost is given in Table 30.

Table 30. *Channel catfish overwintering production and cost.*

Number stocked	1,200
Number spring harvested	1,186
Mean harvested length (mm)	210
Percent request filled	100
$250.00 (total production cost)	
1,186 (total number produced) = $211.00/1,000 fish	

HYBRID STRIPED BASS

Production Techniques

Oklahoma personnel produced Hybrid striped bass (wiper) fry by crossing female striped bass with male white bass. The resulting fry were flown to the Creston, Iowa airport on May 11, 2007. The fry were then transported by vehicle to the Mount Ayr Fish Hatchery, and tempered prior to stocking into the largest six hatchery ponds totaling 6.02 acres at 80,000 fry per acre. The fry were tempered with pond water at a rate of 1 gallon/minute at five minute intervals. After 30 minutes the fry were released into the production ponds. The fry appeared lively during the tempering process and when released. Weekly seining yielded some insight prior to harvest about growth and relative survival. Some of the ponds were spot treated with copper sulfate to control algae. No other inputs were given to the wiper production.

Production Results and Cost

A total of 12,475 wipers were harvested from all six ponds on June 18, 2007. They averaged 65 mm total length and 325 per pound. A production and harvest summary is listed as Table 31.

Table 31. *Hybrid striped bass production and cost.*

Number stocked	500,000
Number spring harvested	12,475
Mean number per acre	2,075
Percent harvested	2.5
Length at harvest (mm)	65
Percent request filled	18
$3,075 (total production cost)	
12,475 (total number produced) = $246.00/1,000 fish	

ADVANCE LARGEMOUTH BASS FINGERLING PRODUCTION

Production Techniques

Ponds 1, 2, 3, 6, 7 and 8 consisting of 6.02 acres were filled on June 21 and from 2 to 20

pairs of adult bluegills per acre stocked and allowed to freely nest spawn. Pond 3 received only 2 pair of adult bluegill. Fingerling largemouth bass from the Fairport Hatchery were stocked at a rate of 4000/acre on June 27. No fertilizer was added to any pond but copper sulfate was used to spot treat developing filamentous algae.

Production Results and Cost

All ponds were drained and harvested on October 31 and November 1. All ponds produced fish averaging 30/pound. Pond 3 produced the greatest number of fish with no loss of size. The low numbers of adult bluegill pairs did not hamper growth and may have increased largemouth bass survival. Table 32 contains the production results and cost for the Advanced Fingerling Largemouth bass.

Table 32. *Advance fingerling largemouth bass production and cost summary.*

Number of breeding bluegill pairs	2 to 20
Number of bluegill harvested	0
Number of largemouth bass stocked	24,000
Number harvested	12,730
Harvest per pound	30
Percent harvested	53
$2,150 (total production cost)	
12,730 (total number produced) = $169.00/1,000 fish	

COMMENTS

Overwinter survival was very good and the water levels maintained themselves quite easily. Filamentous algae did survive through the winter and was actively growing when the ponds were harvested in March. Filamentous algae was present during but did not hamper the wiper production. It did not completely die during the drained period between the wiper production and the refilling for the largemouth production. It did reappear extensively during the largemouth bass production and densities hampered harvest. Areas of algae were actively growing when the ponds were drained in late October. Ponds 3 and 6 are starting to produce large areas of rooted vegetation. This vegetation may help with insect production and therefore improve largemouth bass growth. It also stays in place when ponds are drained and does not trap fish as easily as algae. All pond edges were not mowed and the mature terrestrial vegetation may consume enough nutrients to help suppress algae growth. Pond 2 contains by far the worst infestation of filamentous algae. Spot treating with copper sulfate seems to be effective at limiting the algae that did appear but is labor intensive and corrosive to the sprayer pump.

2007

PRODUCTION REPORT

RATHBUN HATCHERY

Andy Moore	**Public Service Executive 2**
Chris Clouse	**Natural Resources Biologist**
Dave Walljasper	**Natural Resources Biologist**
Randy Esser	**Natural Resources Technician 2**
Dean Roush	**Natural Resources Technician 2**
Paula Surber	**Natural Resources Technician 2**
Mark Zavacki	**Facilities Maintenance Coordinator**
Gene Daniels	**Natural Resources Technician 1**
Elaine Spencer	**Secretary 2**
Nikki Schlittter	**Natural Resources Aide**
Jordan Augspurger	**Natural Resources Aide**
Andy Sease	**Natural Resources Aide**
Gene Huff	**Natural Resources Aide**

Chris Clouse, Hatchery Co-Manager
Dave Walljasper, Hatchery Co-Manager

Moravia, Iowa

INTRODUCTION

Rathbun Hatchery is an intensive/extensive warm water/cool water fish hatchery located nine miles north of Centerville, Iowa in Appanoose County. The hatchery is situated on 375 acres of land, leased from the Army Corps of Engineers, directly below Rathbun Lake dam.

Fish production efforts in 2007 were directed toward the propagation of channel catfish, walleye and muskellunge. Fish production assigned and percentage of production accomplished are given in Table 33.

CHANNEL CATFISH PRODUCTION

Channel Catfish Fingerling Production Techniques

The Missouri Department of Conservation supplied the catfish for 2007 production. Fry from Missouri's early spawned catfish were received on May 30th and the pond-spawned catfish were received on July 2nd. Table 34 details 2007 catfish indoor tank production from the catfish received from Missouri.

A total of 139,940 early spawn fish weighing 226.6 lbs and ranging from 591.4/lb to 647.6/lb were placed into the ten one-acre lined ponds (Table 35). Circulating Ponds 1 and 2 were stocked on July 16th and 18th with 96,352 pond spawned fish from start tanks for 2007 cage catfish. On July 18, 100,068 fish were moved from the start tanks and stocked into Circulating Pond 6 for farm pond stocking.

The ESC vaccine, AQUA-VAC-ESC was again purchased and the channel catfish fry were vaccinated by Missouri personnel prior to arrival at the hatchery.

Channel Catfish Fingerling Production Results and Cost

This was the first year of a multi-year study funded by Federal Aid to Sport Fish Restoration Project No. F-106-R, Study #7029. Hatchery and research personnel worked together to increase catfish feeding efficiency in order to achieve larger fingerlings for fall stocking. The study involved two types of satiation feeding regimes (Apparent and 15 Minute) and an automatic feeder regime in order to achieve the best stocking size catfish from the lined ponds. Apparent Satiation fish were fed all the feed they could eat once per day. 15-Minute Satiation fish were fed a benchmark

Table 33. *2007 Fish production assignments and percent attained.*

SPECIES	SIZE	ASSIGNED PRODUCTION	% ATTAINED
Channel catfish	2"	128,900	80.8
Channel catfish	4"	1,800	561.2
Channel catfish	Cage	65,860	103.8
Channel catfish	8"	91,511	99.7
Channel catfish	10"	4,100	100.4
Muskellunge	10"	3,590	94.9
Walleye	Fry	56,480,000	70.5
Walleye	2"	313,600	182.1
Walleye	8"	197,425	97.6

Table 34. *Channel Catfish Fry Production at Rathbun Hatchery May 2007, Missouri Trip 1*.

Total In		Total Out		Stocked To
Number	Weight (lb)	Number	Weight (lb)	
162,090	182.5	139,940	226.6	Lined Ponds
		8,400	15.4	Research Ponds
		3,630	14.2	Farm Pond Program
		9,728	38.0	Blue Lake
Sum		**161,699**	**294.2**	
Survival (%)		**99.8**		
FC		**1.1**		

July 2007, Missouri Trip 2.

Total In		Total Out		Stocked To
Number	Weight (lb)	Number	Weight (lb)	
207,177	120.5	196,420	664.8	Circulating Ponds
		10,750	50.0	Surplus
Sum		**207,170**	**714.8**	
Survival (%)		**94.4**		
FC		**1.2**		

amount they could eat in 15 minutes twice/day. If the feed was cleaned up, the amount was increased for the next feeding.

Dissolved oxygen and ammonia readings were taken before dawn multiple times per week as pond loadings increased. Paddlewheel aerators were utilized when the dissolved oxygen levels began to decline and proved beneficial in maintaining adequate dissolved oxygen levels in the ponds in August and September. Pond

Table 35. *2007 Channel catfish fingerling production in lined ponds.*

Pond	Date In	No. In	#/lb	No. Out	#/lb	Date Out	% Survival
21	6/5	13,981	635.50	7,551	5.32	9/20, 9/21, & 9/24	54.0
22	6/5	13,988	647.60	8,370	8.47	9/24	60.0
23	6/5	13,980	600.00	9,152	5.80	9/17	65.0
24	6/5	13,981	635.50	9,345	5.04	9/18	67.0
25	6/5	13,987	597.74	9,727	7.59	9/25 & 9/27	70.0
26	6/5	14,016	591.39	10,736	5.22	9/19 & 9/20	77.0
27	6/5	13,988	647.60	9,573	4.67	9/12	68.0
28	6/5	13,980	600.00	8,970	6.40	9/4 & 9/5	64.0
29	6/5	14,016	591.39	8,417	6.18	9/5	60.0
30	6/5	14,023	637.41	9,441	7.33	9/13 & 9/14	67.0
TOTAL		139,940	617.5654	91,281			65.0

flushing up to several hundred gallons per minute was implemented when un-ionized ammonia levels increased above desirable levels.

From the ten lined ponds, 91,511 catfish were harvested beginning 9/4 and ending 9/27. The fish ranged from 4.6/lb. to 8.4/lb with total survival in the ponds ranging from 54-77% with an average survival of 65%. The catfish were harvested from the ponds with the aid of the fish sorting table, hydraulic crane and fish basket. Only 1 extraneous green sunfish was found.

Gull predation during the production season was not as prevalent as during the past production seasons. Reduced mortalities from lower stocking densities attracted fewer gulls. The numbers of blue herons foraging in the ponds were considerably fewer than during the past several years. Cormorant problems were again minimal during the fall migration.

A total of 29,146 seven inch channel catfish were obtained from Missouri's Lost Valley hatchery in mid-June and stocked in several lakes in the SW district.

Farm pond stocking requirements utilized 81,698 three-four inch catfish. These fish were transferred to Fairport on 10/1 and 10/8.

The Rathbun Research Facility received 8,400 catfish from several start tanks for use in the research lined pond study. The research facility also received 32,858 catfish at 1,247/lb to be used for INAD studies.

Table 36 details the 2007 channel catfish small fingerlings production and cost.

Overwintered Channel Catfish Fingerling Production Techniques

Cage Catfish

In February 2007, cage catfish being over-wintered in circulating ponds were brought into the start tanks to help improve survival. They were started on feed in late March and remained in the start tanks until stocking in early June.

In the fall 2007, when water temperatures dropped below 60°F, feeding rates in the cage catfish over winter circulating ponds were reduced to 1%. All feeding was discontinued when the fish refused to feed, which occurred at a water temperature of about 45°F. These catfish, for 2008 cage catfish, were brought inside in December and are being over-wintered in the tank room start tanks to help increase survival. Feed will be offered in late March when water temperatures again reach 45 degrees. These fish will remain in the start tanks until stocking in late May.

Table 36. *2007 Channel catfish small fingerling production results and cost.*

Fry received from Missouri	369,267
Number of channel catfish stocked into lined ponds	139,940
Number of fingerlings stocked into circular ponds	196,420
Number of fry provided to Rathbun Research Facility	41,258
Number 3" fingerlings for farm pond stockings	81,698
Number of 4" catfish stocked	10,101
Number held over-winter in tanks	92,667
Number of 2" catfish stocked	9,728
Total pounds produced	7032.71

$22,241.42 (total production cost)
589,378 (total number produced) = $0.0377371/fish x 1,000 = $37.74/1,000

10 Inch Catfish

Approximately 22,231 seven inch catfish fish weighing 2,615 lbs. were over-wintered in a circulating pond for production of 10 inch fish in July.

Overwintered Channel Catfish Fingerling Production Results and Cost

Cage and seven inch channel catfish production results and cost are presented in Table 37.

Of the 22,231 Age I catfish over-wintered for growth to ten inches, a total of 4,117 fish were graded from the pond and stocked on 6/20 and 7/19 (Table 38). The remaining 11,614 seven inch catfish, weighing 2,431 lbs., were stocked on 7/19 and 7/20 from the concrete circulating pond. The total seven inch stocking from all sources was 146,419 fish weighing 24,034 lbs.

Catfish harvested from the concrete ponds were administered a dosage of 30-50 ppb Antimycin in the pond and were visually inspected on a sorting table in order to eliminate any undesirable scaled species. Two 4" green sunfish were found in a concrete circulating pond when transferring cage catfish to the start tanks for over wintering. Catfish stocked in southwest Iowa were visually inspected at the stocking sites via an inspection trough. No undesirable species were found.

WALLEYE FRY PRODUCTION

Production Techniques

Adult walleye were collected with gill nets (2.5-inch bar mesh, 16 meshes deep x 100 feet long) set on riprapped areas in the lake beginning March 27 and ending April 12. Nets were set around 6:00 p.m., checked for fish at 9:00 p.m. and midnight, and then removed from the lake until the next day.

After the walleyes were removed from the gill nets they were transported to the hatchery and sorted by sex and ripeness. "Ripe" females were spawned immediately. "Green" females were placed in indoor holding tanks until they ripened or until 5 days elapsed, whichever came first. Females were checked during the day and any ripe females spawned.

Sperm was collected from male walleye by hand stripping semen from several fish into a chilled plastic pan. A chilled syringe was then used to collect the semen and a total of 3 cc of sperm was placed into a tissue culture flask. About 6 cc of extender was then slowly added and mixed into the flask for a total of 9 cc of extended semen. The flasks were then stored in a refrigerator until needed.

The "dry" method was used for taking eggs. Eggs from one or two females were stripped into a dry pan. After all the eggs were in the pan, approximately half the semen was added, stirred into the pan by hand, and then water added. After about 30 seconds, the remaining semen in the flask was added as well as rinsate from the flask. The egg and sperm mixture was swirled for another two minutes and then placed into a small plastic dishpan containing a mixture of Fuller's earth and water for another two minutes. The eggs were then moved to hardening trays, rinsed, and allowed to remain for at least 4 hours before being placed into incubator jars.

Production Results and Cost

A total of 493 females and 711 males were captured from Rathbun Lake and

Table 37. *2007 Cage and 7" channel catfish production results and cost.*	
Number on hand January 1, 2007 in the outside ponds	214,796
Number of cage catfish stocked from start tanks	65,061
Pounds of cage catfish stocked from start tanks	3,330
Number of 7" catfish stocked from start tanks & concrete ponds	17,761
Pounds of 7" catfish stocked from start tanks & concrete ponds	3,114
Number of 7" catfish stocked from lined ponds	91,511
Pounds of 7" catfish stocked from lined ponds	15,244
Number of 7" catfish stocked from Lost Valley Hatchery	29,146
Pounds of 7" catfish stocked from Lost Valley Hatchery	4,406
Number of 7" catfish stocked from Research ponds	8,001
Number of 7" catfish produced for 10" grow out	22,231
Pounds produced for 10" grow out	2,615
Total catfish produced and/or stocked	233,711
% Survival (January 1, 2007 to harvest)	83.5
Pounds feed fed[1,2]	21,998.8
Pounds of fish produced[1,2]	24,034
Pounds gained[1,2]	12,115.7
Food conversion[1,2]	1.81
2006 production cost	$56,017.08
2007 Rathbun Hatchery production cost[1,2]	$97,908.26

$153,925.34 (total production cost)
225,140 (total number produced) = $0.68368/fish x 1,000 = $683.68/1,000

[1]Research fish not included.
[2]Lost Valley fish distribution cost only & feeding not included

Table 38. *2007 Ten-inch channel catfish results and cost.*	
Number Stocked	22,231
Pounds Stocked	2,615
Number Harvested by grading	4,117
Pounds Harvested	1,400
Mean size stocked (fish/lb)	2.9
% Survival (including 7" fingerling stocking)	71.0
Pounds Fed	551.5
Pounds Gained	278.64
Food Conversion	1.98

$10,923.82 (total production cost)
4,117 (total number produced) = $2.625545/fish x 1000 = $2,,653.34/1,000

Table 39. *2007 Walleye fry production results and cost.*	
Quarts of "Green" eggs from Rathbun Reservoir	379.5
Quarts of "Green" eggs from Fairport	12.0
Quarts of eyed eggs to Oklahoma	7.5
Number of eggs per quart	135,000
Number of fry hatched	39,069,000
Percent hatch Rathbun eggs	78.6
Percent hatch of Fairport eggs	72.5
Number of fry shipped to Rathbun Research	145,000
Number of fry transferred to Rathbun Hatchery Ponds	600,000
Number of fry shipped statewide	39,069,000
Total number of fry stocked	39,814,000
$54,788.81 (total production cost)	
39,814,000 (total number produced) = $0.001376/fry x 1,000 = $1.38/1,000	

taken into the hatchery (Table 39). Eggs were taken from 376 females or 76.2% of all females captured. Water temperatures at the dam during netting ranged from 45 to 52°F. Fry were stocked from April 25th to May 2nd.

A small number of river strain walleye were hatched this year for Fairport hatchery. Fairport staff spawned the walleye collected from the Mississippi River and then hardened the eggs at their facility. Since they were not equipped to hatch them they were transferred to Rathbun. After the eggs hatched we counted the fry for stocking into various Fairport ponds. Excess river strain fry were stocked into Coralville Reservoir.

WALLEYE FINGERLING PRODUCTION

Production Techniques

Walleye production was divided into three phases. Phase I was the initial rearing

Table 40. *2007 Walleye fingerling Phase I production and cost.*

Pond	Stocking Rate	Length (mm)	Weight (g)	Pounds Harvested	Fish/lb	# Harvested	% Return
21	75,000	42.5	0.506	85.9	858.5	73,745	98
22	50,000	44.77	0.604	62.5	713.2	44,573	89
23	50,000	47.83	0.757	83.5	596.2	49,779	99
24	75,000	42.5	0.494	73.95	938.0	69,365	92
25	50,000	48.31	0.763	84.55	599.9	50,724	101
26	50,000	46.29	0.669	72.7	679.9	49,429	98
27	50,000	46.34	0.675	76.15	653.5	49,764	99
28	75,000	41.68	0.464	76.0	912.0	69,312	92
29	75,000	42.15	0.494	71.1	945.9	67,253	89
30	50,000	44.96	0.603	65.1	721.8	46,973	93
TOTAL	600,000			751.427	762.2	570,917	95

$12,513.54 (total production cost)
570,917 (total number produced) = $0.021918/fish x 1,000 = $21.92/1,000

period when walleye were grown from fry to fingerling in the lined one acre ponds. Phase II was the period when the fingerlings from pond culture were brought indoors and acclimated to manufactured feeds. Phase III was the remaining period when the fish are moved to outdoor concrete ponds for final grow out.

Phase I
Lined Ponds

This was the sixth year of a multi-year study funded by Federal Aid to Sport Fish Restoration Project No. F-106-R, Study 7022. Rathbun Hatchery and Research Station staff are working together to assess walleye production techniques in lined ponds.

Ponds were filled from April 17 to April 20. At this point the ponds were two thirds to three quarters full. We resumed filling on April 23 and ponds were full by 7 p.m. that night. Walleye fry were stocked into the ponds on April 30. The ponds were divided into 2 different stocking rates for research purposes. The stocking rates used were 50,000 and 75,000. Alfalfa pellets were applied on a weekly basis beginning April 20 at an application rate of 100 pounds per week applied as 50 lbs. on Mondays, and 50 lbs. on Thursdays. Ten applications were made for total fertilization of 500 pounds per pond. Inorganic fertilizer was also added to boost P levels to attain a 7:1 NP ratio during the week of filling. Water quality, zooplankton, and fish growth was monitored throughout the culture period. Table 40 details the production from the lined ponds.

Phase II
Indoor Tanks

The tank room was stocked May 29 through May 31 with 303,081 walleye. Rathbun ponds contributed all of these fingerlings. Table 41 details the indoor tank distribution from these sources. Most of the walleye tanks were part of the cooperative project (Project No. F-39-R, Study 7003) with Rathbun Research biologists.

Tank stocking density was set at 12,500. The fish were initially fed Otohime C2 and then transitioned to Nelson and Sons WG 9206 diet for grow-out.

A new grading study was started in 2007. Walleye that were graded off were stocked into Lake Icaria (11,430), Saylorville (40,132), and Rathbun (1,623).

Table 41. *Phase II Walleye Production at Rathbun Hatchery, 2007.*

Total In		Total Out		Stocked To
Number	Weight (lb)	Number	Weight	
303,083	451.2	225,008	2,809.6	Circulating Ponds
		11,430	149.8	Icaria
		40,132	466.8	Saylorville
		1,623	31.0	Cannibals to Lake Rathbun
Sum		**278,193**	**3,457.2**	
Survival (%)		**91.8**		
FC		**1.22**		

Phase III
Outdoor Ponds

Walleye from indoor start tanks were moved to ten outdoor circulating ponds beginning June 25th and continuing through July 2nd. A total of 225,008 walleyes were stocked into the concrete ponds.

Production Results and Cost

The ten ponds of walleye were stocked out beginning on October 9th due to the warm fall weather delaying the water cool-down to 65 degrees. On Tuesday, October 23rd a boat at the marina was found to have zebra mussels in the engine cooling water strainer. This discovery prompted a temporary halt to walleye fingerling stocking until further investigation and a plan for veliger eradication in the distribution units was implemented. Further investigation of the boat after removal from the lake revealed numerous adult zebra mussels in the stern trim tab area and also around the cooling water intake in the hull. Research and conversation with Ken Snyder at the Fairport Fish Hatchery indicated that a pretreatment of 750 ppm KCL for one hour followed by a treatment of 25 ppm Formalin for two hours would eliminate any veligers in the distribution units. This treatment procedure was followed for the remainder of the walleye fingerlings that were stocked in late October and early November. All walleye stocking was completed by November 9th. A total of 192,357 walleyes averaging 3.33/lb for a total weight of 57,699 pounds were stocked statewide.

The Rathbun Research Facility provided an additional 16,458 walleye for stocking into Rathbun and Sugema ranging from 6.5-10.5/lb.

Table 42 details the 2007 Phase III pond production. Table 43 lists Phase II and III walleye production cost.

MUSKELLUNGE PRODUCTION

The muskellunge were over-wintered during 2006-2007 for spring stocking and did not have Furunculosis problems as they have in previous years. Spring stocking of the muskellunge started on 5/15 and was completed on 5/16.

Minnows were purchased from private dealers for over-winter forage. In addition, Manchester Trout Hatchery provided approximately 875 lbs of rainbow and brook trout for musky forage from March through early May.

Muskellunge were again transferred from Spirit Lake to Rathbun in October 2007. These fish are being held in a concrete circulating pond.

Table 42. *2007 Walleye Phase III circular pond production.*

Pond	No. In	Lbs. In	Fish/lb	No. Out	Lbs Out	Fish/lb	% Survival
3	22,652	261.3	86.7	19,289	5784.5	3.33	85.2
5	22,502	332.3	67.7	21,270	7090.0	3.00	94.6
7	22,532	255.2	88.3	18,209	5466.0	3.30	80.8
11	22,499	247.5	90.9	18,784	5091.1	3.69	83.5
13	22,330	329.8	67.7	21,286	6254.5	3.40	95.3
15	22,502	252.0	89.3	19,340	5158.0	3.75	85.9
16	22,444	268.5	83.6	18,178	5645.6	3.22	81.0
17	22,500	341.9	65.8	21,041	6090.0	3.46	93.5
19	22,559	254.6	88.6	15,873	4884.0	3.25	70.4
20	22,488	266.4	84.4	19,077	6235.2	3.06	84.8
Total	225,008	2809.5	80.1	192,347	57698.9	3.33	85.5

Table 43. *2007 Phase III walleye production results and cost.*	
Number of walleyes stocked into concrete ponds	225,008
Pounds of walleyes stocked into concrete ponds	2,809.5
Total number of walleyes stocked statewide from concrete ponds	192,347
Total pounds of walleyes stocked statewide from concrete ponds	57,698.9
% Survival	85.5
Pounds fed	92,415
Pounds gained	54,889.4
Food conversion	1.68

$182,865.25 (Phase II and III total production cost)
192,347 (total number produced) = $0.950705/fish x 1,000 = $950.71/1,000

Tables 44 and 45 detail the 2006/2007 and 2007/2008 muskellunge production results and cost at Rathbun.

EVENTS AND IMPROVEMENTS

The conference room at the hatchery was used for a variety of meetings in 2007. These meetings included Law Enforcement Bureau (14), Hunter Education class (1) and miscellaneous meetings were held 22 times. The dorm area was also used by various groups (in association with meetings) a total of 10 times. The shooting range was utilized 2 times by DNR staff and 7 additional times by other law enforcement agencies.

One-half of the concrete garage floors in Residences #1 & #2 were replaced to eliminate water drainage into the house wall footing along the common wall. Floor drains were also installed in the replacement concrete slabs to allow drainage water to flow into a French drain installed in the back yard of the residences.

Treated lumber decks were constructed over the original sunken concrete stoops at Residences #1 and #2 to eliminate excess step height when exiting the residences. A similar deck will be constructed at Residence #3 in 2008.

A 1,500 gallon liquid oxygen tank was purchased in order to provide sufficient volume during peak demand periods in August and September. The original 900 gallon tank was delivered to Manchester Hatchery.

A major ice storm hit Appanoose County on December 11th resulting in tree damage and related power outages. The power at the hatchery and residences was out for approximately 44 hours. The hatchery generator performed as expected and the over wintering catfish and musky were not affected.

Aluminum hand railings were installed on both hatchery and research lined ponds towers in order to provide increased worker safety. Repairs to the pond liners and associated hardware will be made before the ponds are utilized for walleye production in April.

Table 44. *Muskellunge production results and cost for 2006/2007.*	
Number of muskellunge on hand January 1, 2007	3,975
Total number of muskellunge held until spring of 2007	3,407
Total pounds of muskellunge held until spring of 2007	Counted
Number stocked statewide	3,407
Mean size stocked (fish/lb)	~2.5
% Survival	84.8
Spirit Lake production cost	$10,923.31
Rathbun production cost	$13,902.19
$24,825.50 (total production cost) / 3,407 (total number produced) = $7.286616/fish x 1000 = $7,286.62/1,000	

Table 45. *Muskellunge production results and cost for 2007/2008.*	
Number of muskellunge received October 2007 from Spirit Lake Hatchery	8,242
Number on hand January 1, 2008	8,172
% Survival	99.1
Spirit Lake production cost[1]	$29,176.68
Rathbun production cost to date	$5,408.79
[1]Does not include cost of minnows used as forage at Rathbun	

A record rainfall of 12.5" fell in the area on the night of August 23rd resulting in some minor damage to the hatchery grounds. An earthen berm and rock drainage ditch east of the lined ponds was washed out by the heavy drainage from the hillside. Water from the Chariton River rose to within approximately one foot from overtopping the lined pond dikes. The sewage lagoons and three-quarters of the hatchery pollution pond were inundated by the floodwaters for several days.

2007

PRODUCTION REPORT

SPIRIT LAKE HATCHERY

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Spirit Lake, Iowa

INTRODUCTION

The Spirit Lake Fish Hatchery is a coolwater facility located one mile north of the city of Spirit Lake in Dickinson County. The hatchery complex is situated on an isthmus between Spirit Lake and East Lake Okoboji. During the period of this report, walleye (*Sander vitreum*), northern pike (*Esox lucius*), and muskellunge (*Esox masquinongy*) were hatched and reared at this location.

Production facilities at Spirit Lake consist of seven egg incubators with a total capacity of 435 jars, 29 indoor holding/rearing tanks with a total volume of 3,454 cubic feet, nine non-drainable ponds, two drainable ponds, and two natural lakes. Hatchery water gravity flows through a twenty-inch line from Spirit Lake into a filtration pond. It is then pumped from the pond through a coarse gravel crib filter into a headbox located at the main hatchery building. Water is then gravity fed into the indoor production facility.

Production quotas for 2007 are presented in Table 46.

Table 46. *2007 production quotas*.

Species	Size	Number Requested	Percent Attained
Walleye	Fry	49,760,500	98.45%
Walleye	Fingerling 2”	307,850	197.49%
Walleye	Fingerling 6-8”	111,000	156.61%
Northern Pike	Fingerling 2-3”	123,025	46.28%**
Muskellunge	Green eggs	100,000	561.00%
	Swim-up fry	30,000	106.13%
	Fingerling 2”	65,000	184.70%
	Fingerling 4-6”	12,000	101.94%
	Fingerling 10”	6,029	136.70%

**25,536 fish obtained from Illinois contributed to this percentage

WALLEYE FRY

Production Techniques

Walleye brood fish were collected from Spirit, East, and West Okoboji Lakes by crews composed of fisheries personnel from various state locations. Six crews consist of two- to three- person teams using gill nets to capture target species. Since gillnetting material was not available in the standard size from traditional sources, protocols were altered for some lakes. Upon consulting with management and research staff, the following changes were made: East Okoboji Lake was fished with gillnet measuring three-inch bar, 6-inch stretch, since many large walleye and muskellunge are captured in this lake; Storm Lake was fished with two-inch bar, four-inch stretch netting since this lake collects only walleye and there are abundant fish of smaller sizes; Spirit Lake was fished with the traditional 2.5-inch bar, five inch stretch mesh since data has been collected in this manner for many consecutive years; West Okoboji was fished with a combination of 3-inch bar, six inch stretch mesh; and Clear Lake started the season using 2.5-inch bar, five inch stretch web but replaced these nets with three-inch bar, six-inch stretch when the original nets became too worn to fish properly. It was noted that those nets of three-inch bar were hung too tightly, with too few meshes per tie. If this size mesh is used in the future this will be corrected. Netting began on April 9 and 10, but was suspended until April 13th due to blizzard and extreme cold conditions. The second session began April 13 and was completed April 20, 2007 totaling 10.0 netting days or 1300 netting hours. Nets were set about 6:30 p.m., lifted at 10:00 p.m. and again at 1:00 a.m. Following the final lift, nets were removed from the water. All walleye captured were transported via live truck to the hatchery, where they were sorted by sex and gonadal development. Fish which were “ripe” or ready to spawn immediately were either stripped after the last net lift or by the day crew. Fish considered “green” or not ready to spawn were placed in tank compartments segregated by lake and date of capture and checked for readiness every 24 hours. Those found to have become ready to spawn were stripped during the morning shift. After spawning, each fish was weighed, measured,

and checked for implanted visual tags by fisheries research crews. If no tags were found, they were implanted before any fish were returned to the lake from which they were captured.

Milt from male walleye was collected and pooled by hand stripping semen from several fish into a chilled plastic pan and extending it with a saline solution for later use. To extend milt, a sterile serological pipette was used to add extender and milt to standard tissue culture flasks. A total of three milliliters of milt was placed into each flask, six milliliters of extender was slowly added, and the solution was gently mixed. Flasks were capped and stored in a standard refrigerator until needed.

The dry method was used to take eggs from adult walleye. Females were toweled dry after being netted and eggs were stripped into a dry pan. Depending upon the size of the female, eggs would be taken from one to several fish per pan. When all eggs needed were stripped into each pan, approximately four to five milliliters of extended semen was added and stirred in. After approximately 30 seconds, the remaining contents as well as rinsate from the flask were added to the pan. The egg and sperm mixture was swirled for two minutes and then placed into plastic pans containing a mixture of water and Fuller's earth. Eggs were stirred in this mixture for an additional two minutes before being poured into hardening trays. In these trays they were rinsed and allowed to remain for a minimum of four hours before being transferred to incubator jars.

Spirit Lake and Rathbun Hatcheries were unable to capture sufficient walleye brood fish to meet fry stocking requirements. Therefore, fisheries management and research personnel were employed to net brood fish and collect eggs at Storm Lake, located in Buena Vista County, and Clear Lake, located in Cerro Gordo County. The Storm Lake crews began netting on March 30 and concluded on April 2, 2007, then began again on April 13 and concluded on April 15, 2007. Clear Lake began netting April 9 and continued through April 18, 2007. Netting, handling, and spawning techniques were similar to those used at Spirit Lake. Eggs and water from these satellite stations were placed in plastic bags to which oxygen was added, sealed, and packed into Styrofoam containers for transport to the Spirit Lake Hatchery. Upon arriving at the hatchery, egg bags were floated in hatching troughs until temperature equilibrium was reached. Each bag was emptied into a wooden-framed 1/8-inch round nylon mesh keep set within a tub filled with water. Eggs were gently washed and passed through the screen to break up any clumps that had begun to form in the transportation bags. After washing and sieving, these eggs were placed in incubator jars. In order to avoid massive clumping, eggs taken in the hatchery were also screened in this manner.

For the second consecutive year, water levels in the Iowa Great Lakes were above crest, and water was flowing through the spillway from Spirit Lake into East Lake Okoboji. Catch rates in East Okoboji were only about 60% of those seen in past years, whether due to net changes or some other factor is unknown. Catch rates on West Okoboji were increased nearly three-fold over the previous year, which was possibly due to increased netting effort on this lake. Spirit Lake catch also more than doubled over the past year, bringing it back to more normal rates.

Egg take was 290.1 quarts in the Iowa Great Lakes or 2.6 times that taken in 2006, but hatch was significantly reduced at 40.7%. This was due to several complicating factors. First, eggs received from Storm Lake were tempered down ten degrees and then suffered a prolonged incubation phase. Clear Lake used a sand point filter for water used to harden eggs in an effort to exclude zebra mussel veligers and the first five days' egg take were lost due to extreme temperature fluctuations. Day six eggs had the highest percent hatch, but rates never reached the usual high percentage seen from this lake. It was generally a poor year for incubation as

water temperatures were consistently low and only began warming at the end of the cycle. At lower incubation temperatures, eggs develop slowly, leaving the door open for many potential sources of loss.

Total walleye brood fish capture information is found in Table 47. Egg viability data is found in Table 48. The Iowa Great Lakes region cultured 290.10 quarts of eggs with an average viability of 83.0%. Fertility percentages were observed at four days post-spawn. Eggs taken from Clear and Storm Lakes still contributed very significantly to the total numbers of fry produced.

Table 47. *Walleye brood fish capture data.*

Lake	No. Female	No. Male	Total
Storm	473	661	1134
Clear	461	882	1343
East Okoboji	62	9	71
West Okoboji	115	60	175
Spirit	230	218	448
Total Great Lakes	407	287	694
Total All Lakes	**1341**	**1830**	**3171**

Table 48. *Egg viability by lake.*

Lake	Quarts	Percent Viable
Storm	126.65	77.5%
Clear	362.75	70.6%
Great Lakes	290.10	83.0%
TOTAL	**779.50**	**MEAN = 76.34%**

Production Results and Cost

Walleye fry production and costs are given in Table 49. A total of 779.50 quarts of eggs were placed on battery incubators at the Spirit Lake Hatchery. These eggs were the combined take from Storm Lake, Clear Lake, and the Great Lakes region.

Table 49. *Walleye fry production and cost.*

Total eggs taken	120,431,970
Total fry produced	48,990,000
Percent hatch	40.7%
Total cost	$116,380.32
Cost per 1,000	$2.38
Expenses from Clear Lake and Storm Lake **ARE included in these figures*	

WALLEYE FINGERLING

Extensive Production Techniques

2" Fingerlings

Extensive culture of two-inch walleye fingerlings was conducted in two natural lakes. Welch Lake (57 surface acres) and Sunken Lake (12.5 surface acres) are both located north and west of the hatchery complex in Dickinson County. These lakes were treated with rotenone in 2006 to eliminate carry-over fish from the previous rearing season.

Early in April, water quality testing was begun to determine whether fertilization would be necessary in Sunken Lake. In addition to total nitrogen and total phosphorus, the dissolved oxygen, pH, alkalinity, hardness, temperature, and zooplankton levels were monitored. At all times, the ratio of total nitrogen to total phosphorus was 20:1 or greater, and it was determined that no fertilization was necessary. All fry were tempered to equilibrate the pH difference between the 8.7 level in the hatchery and the 8.9 of the nursery lake. A total of 1,500,000 fry were stocked into Sunken Lake on May 4, 2007. When fish had grown to the desired size, they were harvested using drag seines of ¼ inch mesh size and stocked as requested.

Welch Lake water quality was also monitored during the same period. Total nitrogen and total phosphorus levels were also observed to be 20:1 or greater. Fry were tempered to equilibrate any water quality differences. On May 4, 2007 a total of 1,900,000 fry were stocked into Welch Lake. In an effort to more accurately enumerate numbers of fry stocked into nursery lakes, jars containing correct amounts of sized eyed eggs were moved to individual dedicated hatching batteries and allowed to hatch.

Fry quality was good despite poor incubation conditions. Fortunately, a warming trend began shortly after stocking and excellent

primary production was observed in both nursery lakes.

Production Results and Cost

Extensive culture results and costs for two-inch walleye production are reported in Table 50. A total of 96,000 two-inch fingerlings were brought into the hatchery from Welch Lake for intensive finishing to six inches.

Table 50. *2" Walleye fingerling production and cost.*	
Welch Lake – 57 acres	
Stocked fry	1,900,000
Number removed	344,376
Pounds removed	1,256.93
Sunken Lake – 12 acres	
Stocked fry	1,500,000
Number removed	192,698
Pounds removed	738.68
Total 2" fish produced	**537,074**
Total cost	$11,886.00
Cost per 1,000 fish	$22.13

WALLEYE FINGERLING

Extensive Production Techniques

6" Fingerlings

Upon removal of sufficient numbers of walleye to provide hatchery stock for production of intensively-reared six-inch fish, fathead minnow forage was introduced into Welch Lake. In feeding minnows, our goal was to produce five to six inch walleye fingerlings by October. Approximately 407.0 pounds per acre of fathead minnow forage was stocked into Welch Lake. A total of 23,198 pounds of minnow forage was stocked into Welch Lake during the production season. Of this number, 21,090 were purchased, 0 were trapped, and 2,108 were seined for a total of 254 gallons obtained by hatchery personnel. Water levels in lakes used as minnow sources were generally good this season, but Twelve Mile Lake minnow production had still not returned to an acceptable level. In general, minnow production from various area lakes was highly variable depending upon level of winterkill.

Despite the removal of 344,376 two-inch fingerlings from Welch Lake, survival was so good that it shortly became evident that Welch Lake was still somewhat overcrowded. A seine haul was conducted on August 2, 2007 in an effort to reduce density. A total of 22,416 fish were removed and stocked into the Little Sioux River in Clay County. In spite of this effort, fingerling size remained highly variable.

In anticipation of returning migrating double crested cormorants, a depredation permit was acquired from the United States Fish and Wildlife Service. This permit allows up to 50 birds to be destroyed annually. These fifty birds were sacrificed early in the fall when migration was just beginning, and this successfully discouraged additional birds from locating here. As a result, depredation was negligible. All cormorant carcasses were brought back to the hatchery grounds and buried.

Production Results and Cost

Table 51 lists the results and costs of extensive production of six-inch walleye fingerlings.

Table 51. *6" extensive walleye production and cost.*	
Number removed	156,799
Pounds removed	7,111.86
Total cost	$63,098.28
Cost per 1,000 fish	$402.42

Intensive Production Techniques

6" fingerlings

To accommodate requests for grow-out fish and to provide additional six-inch fingerlings for stocking, two-inch fish are traditionally brought in from nursery lakes for feed training. In 2007, a research proposal was submitted that provided a protocol to determine growth potential by modifying environment and feed type. This trial is two-part, covering both habituation and grow-out. The habituation phase compares two environments, covered raceways with submerged light (abbreviated CSL) and the control standard uncovered raceway with overhead light. It was proposed

that smaller fish (approximately 880/lb.) be compared to 200 – 400/lb. fish, but due to tank space restriction and difficulty in harvesting smaller fish this portion was abandoned. Two diets were compared. These include Otohime, a new Japanese formulation from Reed Mariculture discovered by Rathbun Research, and Bio-Oregon's INVE EPAC CW, the previously best-performing diet for walleye growth and on-feed percentage. This was a 2 by 2 factorial comparison of diet and environment, with growth rates and survival the primary variables of concern. The grow-out trial continued the habituation experiment, with growth rate becoming the most important variable. In all cases, feed was dispensed every 5 minutes for 22.5 hours per day. The remaining 1.5 hours were dedicated to tank cleaning and maintenance.

The experimental protocol included the following categories:

1. Raceway stocking – fish were stocked in two rounds into concrete raceways with a total volume of 1173.4 gallons per tank with 4000 fish per tank per round. Treatments were assigned to raceways as listed in Table. 52.

Table 52. *Experimental treatment tank assignment.*

TANK #	Environment	Diet
5	Uncovered	Otohime
6	Uncovered	EPAC
14	Uncovered	Otohime
11	CSL	Otohime
12	CSL	Otohime
13	CSL	EPAC
15	Uncovered	EPAC
16	Uncovered	Otohime
17	Uncovered	EPAC
18	CSL	EPAC
19	CSL	EPAC
20	CSL	Otohime

2. An initial length and weight of 100 fish per tank was taken, and an initial three to four check weights were also taken with outliers eliminated. An intermediate check weight was done on Day 14 of the habituation phase. Final check weights were taken to determine biomass, and final lengths and weights of 100 fish per raceway were taken at the end of the habituation phase. Feed rates were kept the same between all treatments and feeders required calibration when possible. The amount of feed fed weekly was based on a length-weight regression for prediction of future weight from future length. Future lengths were determined from "standard" growth rates (mm/day/degree) from previous years for the initial fourteen-day period; thereafter growth rates determined for each individual treatment were used. Water quality measures taken daily included temperature and dissolved oxygen, twice-weekly measures included pH, ammonia, and turbidity, and alkalinity and hardness were measured twice during each test phase. Fish averaged 2.12 inches in length with a mean relative weight of 77.38 at the start of the habituation phase. Results of the habituation phase are listed in Table 53.

Table 53. *Results of walleye intensive culture habituation phase.*

	Oto/CSL	EPAC/CSL	OTO/UNC	EPAC/UNC*
Growth rate (in/day)	0.063	0.053	0.046	0.013
Percent survival	100.5	96.6	93.8	92.3
Relative weight	97.87	95.55	91.24	N/D

**as of Day 6; fish stocked out*

Fingerlings were stocked into new tanks for the grow-out phase and divided into three study groups, with an additional group that was not technically part of the study but was included for observational purposes only. This additional group was reared in dimmed lighting. Study groups included fish reared in a dark environment with submerged lighting and fish reared in overhead lighting. Fish that were fed Otohime and reared in a dark environment during the habituation phase were not included in the statistical analysis since they were much larger at the end of the habituation phase than the other two groups. They were tagged "best case scenario" (BCS) fish.

All fish were fed Walleye Grower 9206 during the grow-out phase. Relative weight was

determined at fourteen day intervals. On August 14 the optional group reared in dim lighting was stocked out to make room for muskellunge production. The grow-out phase was ended on September 20 with stock-out of all walleye. Grow-out phase results are listed in Table 54.

On September 20, 12,579 fish averaging 7.3 inches in length were stocked into West Okoboji Lake.

Table 54. *Grow-out phase results of intensively reared walleye fingerlings.*

	DSL	OL	BCS	P value
Final Length	7.37"	6.89"	7.51"	0.0259
Percent Survival	82.3%	89.3%	90.9%	0.1974
Relative Weight	110.89	102.57	107.36	0.0117

Production Results and Cost

Production results and costs of intensively-reared fish are listed in Table 55.

Table 55. *Production results and cost of intensively-reared six-inch walleye fingerlings.*

Received from Welch	96,031
Pounds received	273.30
Number stocked at end of habituation	70,888
Pounds stocked at end of habituation	472.13
Number stocked at end of grow-out	17,038
Pounds stocked at end of grow-out	1,696.9
Mean size (fish/lb.)	10.04
Percent survival – habituation	95.5%
Percent survival – grow-out	76.1%
Pounds fed – habituation	414.15
Pounds fed – grow-out	2,137.57
Pounds gained – habituation	306.73
Pounds gained – grow-out	1,511.95
Food conversion – habituation	0.88:1
Food conversion – grow-out	1.41:1
Total cost	$25,522.18
Cost per 1,000 fish	$2,777.51

NORTHERN PIKE FRY/FINGERLINGS

Intensive Production Techniques

Fyke netting for northern pike began on March 27, 2007 by setting four fyke nets in Hale's Slough. Nets were re-set on March 28 and 29. The three-day set produced 79 males and 74 females. An additional three females were captured with a seine across the slough trap. Two gillnets were set at the mouth of the slough on March 29, 2007, which produced an additional five females. Total adult fish captured over this initial netting period were 79 males and 82 females for a total of 161 fish.

The method of restraint devised in 2005 to allow handling of northern pike without anesthesia was again successfully employed in 2007. Of the 161 adults captured, 61 females and 75 males were stripped on March 30, 2007. Females were hand stripped into a dry pan, and milt was added using similar methods. At this time, a 10% saline solution was not added to the mixture of eggs and milt, and time constraints did not allow experimentation of this parameter in 2007. This will be examined more thoroughly in the 2008 production season if time permits. Fertilized eggs were rinsed with fresh water until rinsate was clear and allowed to water harden for three to four hours. Eggs were placed in hatching jars and placed on the heated water battery at 53° F and gradually warmed to 63° F overnight to accelerate hatch. A total of 19.15 quarts or 1,242,885 eggs were incubated which produced virtually no swim-ups. On April 3, fry began rapidly hatching and swimming into the catch tank. Most fry had completely hatched by 10:00 p.m. this date. Over the next few days, fry did not exhibit any indication that they were ready to swim-up, and by April 6, 2007 were in obvious distress and struggling to remain upright. Diquat treatments had been administered since their hatching was completed, but three days of 30 miles per hour wind from the northwest had made incoming water quality very poor. All fish were transferred to production tanks and those that were capable of swimming were flushed into East Okoboji Lake. The entire incubator and catch tank system was cleaned, disinfected, and allowed to dry to eliminate possible carry-over of any bacterial contamination.

Two gillnets were set on April 2, 2007 to supplement northern pike capture, since most of the females stripped from earlier runs were very small and did not produce a surplus of eggs. Nets were set on Buffalo Run, which produced five green and one spent female for a total of six fish. Fyke nets were also set in Hale's slough, which produced four spent females and two males. Nets were set again on April 10, 2007 in Hale's Slough (two nets) and Garlock Slough (two nets). A total of 22 fish were captured at Hale's Slough, seventeen of which were males and five of which were females. Garlock Slough produced one male northern pike. An additional male was received from Clear Lake. These nets were reset on April 11 and run on April 12, which produced seven males and three spent females, all from Hale's Slough. All males collected were anesthetized and injected with carp pituitary on April 12, 2007 at a concentration of 3 mg/0.5 ml since these fish were small, but dosage remained at 6 mg/kg. Nets were again set in Hale's Slough and East Hottes Lake on April 14, 2007. An additional two spent females and four males were collected. On April 15, 2007 all males were stripped using vacuum aspiration and the milt was extended and placed in a refrigerator overnight. The four uninjected and 31 injected males produced 9.0 ml of unextended milt, which was diluted at a ratio of one to six to cover more eggs. These males were placed in pond #2 after recovery to comply with the withdrawal period required by anesthetic protocol. Females were stripped on April 16, 2007 using standard methods. A total of fourteen fish produced 16.25 quarts of eggs, which were incubated at 63 degrees. By April 20, 2007 most eggs were non-viable. A total of approximately 25,000 swim-up fry were produced from this effort, which were stocked in Hale's Slough.

On April 24, 2007 512,000 eyed eggs were received from Garrison Dam National Fish Hatchery (Lot #1). The eggs were tempered and placed into jars on incubator number 6. Since eggs had started hatching upon arrival, we consulted with Craig Lemon, New Jersey Department of Environmental Protection, Division of Fish and Wildlife to discuss his method of force hatching northern pike fry using bowls. This method successfully separates hatching fry from egg shells and results in a cleaner environment for the young fish. His method requires the addition of water which is approximately twelve degrees warmer than incubator temperatures, which was not available to us. Therefore, this method did not work well and we were forced to continue using our catch tank swim-off method. These fry exhibited the unusual behavior of remaining in the jar long after hatching. On April 30, 2007 a total of 426,603 fry achieved swim-up. Of these, 109,998 surplus fry were stocked into Ventura Marsh, 29,073 were released into East Okoboji Lake, and 287,532 fish were transferred to the rear two-thirds of six concrete raceways. This was done so that plankton-excluding screens could be installed in the front one-third, and so that fish could remain in this area longer before requiring handling. This provides a rearing space measuring 112 inches by 51 inches with an average depth of 20 inches and a total volume of 494.5 gallons. Screens made of 150 micron nylon mesh were suspended under the inflowing water to capture as much plankton as possible. Exclusion of plankton is necessary to convert fish to an artificial only diet, as those which feed on plankton exclusively are not feed habituated once the plankton is no longer available. This results in a subpopulation of much smaller fish which are easy targets for cannibalization. Once cannibalism is widespread, numbers of fish in the tank are greatly reduced on a daily basis. An effective transition phase diet reduces the incidence of cannibalism by providing a diet with comparable palatability. Feed was dispensed every five minutes for 22.5 hours per day. The remaining 1.5 hours were dedicated to tank cleaning and maintenance.

Northern pike fry have traditionally been started on an artificial diet using Biokyowa series B and C feeds with good results. Due to import restrictions, Biokyowa feeds are no longer available. A new diet was discovered in

2006 by Rathbun Research that more closely approximates the formulation of this Biokyowa diet and is produced by Reed Mariculture under the Otohime label. In order to compare this new diet with BioOregon's BioVita, the previously best performing diet for northern pike, a feed trial was devised to compare two diet regimes in the habituation phase and three regimes in the grow-out phase. Habituation started half of the fry on BioOregon's BioVita size #0, then gradually transitioned them through size #1 and #2. The remaining half were started on Otohime B1, then transitioned through sizes B2, C1, and C2. Grow-out diets included Walleye Grower 9206 1.0 mm and 2.0 mm, INVE 8/12 and 12/20, and Otohime EP1 and EP2.

On May 1, 2007 mortality in all production tanks suddenly escalated despite routine prophylactic treatments and best therapeutic efforts. Mortality decreased over the next few days but total loss was severe. No parasites were found on any moribund or dead fish, and due to the sudden onset a bacterial pathogen was suspected. Several factors may have contributed, including extended incubation, poor water quality, or a combination of other variables.

On May 7, 2007 the habituation phase concluded and total biomass was determined. Habituation phase results are listed in Table 56.

Table 56. *Habituation phase results for northern pike diet study.*

	DIET	
	OTOHIME	**BIOVITA**
Percent survival	**13.05%**	**14.38%**
Fish per pound	**8160/lb.**	**14,297/lb.**

On May 10, 2007 an additional 450,000 northern pike sac fry were received from Garrison Dam National Fish Hatchery (Lot #2). These were tempered and poured into floating trays to await swim-up. Many fry were dead at this point and many more were in poor condition. They were then siphoned into jars and placed on incubator number 6. Swim-up was concluded by May 14, but the health of those fish remaining was not good. Therefore, those fish that were actively swimming were moved into a production tank without enumeration and fed Otohime in an attempt to cause as little stress as possible. Initial numbers were back-calculated at the conclusion of the habituation phase. These fish were not included in the northern pike diet study.

On May 24, 2007 all Lot #1 northern pike fingerlings were stocked out. Grow-out phase results are listed in Table 12. A total of 20,113 fish were stocked for an overall percent survival of 7.0%.

The final ten days of rearing northern pike fingerlings encompass what has traditionally been considered the transition phase. During this period, fish transition from a diet of zooplankton and small invertebrates to a fish diet. This period is of great concern for fish culturists since it offers the greatest opportunity for cannibalism. The Biokyowa diet was highly successful in carrying this species through this phase with limited cannibal activity, but no other diet has enjoyed such success. In this study, Otohime's effect on this phase was similar to that observed with Biokyowa. Comparison of the two diets during the transition phase is shown in Table 57.

Table 57. *Transition phase results of northern pike by diet type.*

DIET	PERCENT SURVIVAL
OTOHIME	87.1%
BIOVITA	46.4%

On June 4, 2007 Lot #2 northern pike were stocked. A total of 11,283 fish were produced for an overall survival rate of 73.8%. This is an average of two tanks, one of which was 88.4% and the other was 59.2%. The tank with lower survival had many feeder malfunctions and an outbreak of Chilodonella which caused much of the loss. Due to the decreased density, these fish actually attained a greater total length than the tank with higher survival.

Production Results and Cost

Production results and costs of intensively-reared northern pike fry and three-inch fingerlings are listed in Table 58.

Table 58. *Production results and cost of intensively-reared fry & three-inch northern pike fingerlings.*			
FRY			
Total eggs taken / sac fry (all sources) 3,098,635			
Total fry produced			483,151
Percent hatch			15.59%
Total Cost			$9,298.57
Cost per 1,000			$19.25
FINGERLINGS			
	LOT #1 OTOHIME	LOT #1 BIOVITA	LOT #2
Swim-ups begun	143,272	144,220	19,048
Pounds begun	4.924	4.962	0.655
Number stocked	12,272	7,841	11,283
Pounds stocked	39.475	25.375	25.71
Percent survival	8.57%	5.44%	74.3%
Pounds fed	34.95	28.35	18.5
Pounds gained	34.551	20.413	25.055
Food conversion	1.01:1	1.39:1	0.74:1
Total cost	$10,119.73	$6,618.30	$3,501.43
Cost / 1,000 fish	$822.33	$329.06	$310.33

MUSKELLUNGE FRY

Production Techniques

Adult muskellunge were captured during normal walleye gillnetting operations. Upon capture, adults were transported to the hatchery via live truck and sorted for sex and gonadal development. Of these, 45 males and 16 females were used for egg production. All females spawned were from Spirit Lake and the five females which served as controls for the carp pituitary injection protocol were from East Okoboji. Twenty-five males were from West Okoboji and twenty were from East Okoboji Lake. Weather conditions and water temperatures were generally cold, thus necessitating the injection of female muskies with carp pituitary extract. Injections were administered on April 25, 2007 at a dosage of 6.60 to 6.89 mg/kg. The five female controls were injected with sterile water in the same volume they would have received if injected with carp pituitary.

Both sexes were anesthetized prior to spawning with Aqui-S, an investigational new animal anesthetic with the potential for zero-withdrawal upon approval. Females were hand-stripped using the "dry" method on April 27, 2007. Males were stripped on April 26, 2007 using a vacuum aspirator. In this method, milt is aspirated through microbore tubing into a chilled test tube, then extended at a 2:1 ratio of extender to milt. This extended sperm is stored in capped tissue flasks and refrigerated until needed.

After stripping the female, extended semen previously examined for motility was added as needed for the quantity of eggs extracted. Eggs were rinsed thoroughly and allowed to water harden for two to three hours after fertilization. Eggs were then placed in hatching jars for incubation. Jars were placed on a heated water battery in which the temperature was set at 57° to 60°F for incubation.

A total of 56.05 quarts or approximately 2,305,728 eggs were placed in incubation. A total of 45.85 quarts of eggs were placed on the heated water incubator and 10.2 quarts or 561,000 green eggs were placed on incubator #4 and subsequently transferred to Virginia. The catch basin method of swimming off fry was again used with great success. Muskellunge fry were of extremely high quality in the 2007 production season. The correct number of eyed eggs were placed in jars to be hatched, while excess production of fry were stocked into one hatchery pond used to hold fish for fishing clinics. A total of 590,950 were transferred to Pond #9 and were intended as forage for resident fish.

Production Results and Cost

Muskellunge fry production data and costs are listed in Table 59.

Table 59. *Production results and cost of muskellunge fry.*	
Total eggs	2,305,728
Total fry (viable)	894,230
Percent survival	38.8%
Total cost	$19,400.79
Cost per 1,000	$21.70

MUSKELLUNGE FINGERLINGS

Production Techniques

On May 14, 101,059 muskellunge fry were placed into the middle 1/3 of four concrete tanks, and on May 15 an additional 50,534 fish were moved into a fifth tank. This provides a rearing space measuring 56 inches by 51 inches with an average depth of 20 inches and a total volume of 247.26 gallons. Each tank was fitted with a 150 micron bag over the intake to exclude plankton. A total of 31,838 swim-up fry were transferred to Minnesota Musky Farms in exchange for minnow forage.

As with northern pike, Biokyowa B400 has been used as a training diet in the past, but unavailability of BioKyowa feeds required a change in feeding regime. The 2005 muskellunge diet study showed that BioOregon's BioVita had the greatest on-feed percentage and its use was recommended for future culture. However, Rathbun Research identified a diet made to closely resemble Biokyowa which is marketed by Reed Mariculture as Otohime. In order to determine whether this diet is superior to BioVita, a habituation phase trial was be conducted which compared Otohime sizes B1, B2, C1, and C2 with BioVita mash, #0, #1, and #2. During the grow-out phase, all fish were transitioned to Walleye Grower 9206. Previously, the smallest available size of BioVita was #0, but the mash size was again offered in 2007 and eliminated the need for re-sizing. On day 8 of the habituation phase, tanks were evaluated for growth and percent survival. At this time, fish were split into the rear 2/3 of six different tanks. Feed was dispensed every five minutes for 22.5 hours per day. The remaining 1.5 hours were dedicated to tank cleaning and maintenance. Training phase comparison by diet is listed in Table 60.

Table 60. *Habituation phase results by diet type in muskellunge*.

	OTOHIME	BIOVITA
Percent survival	96.55%	97.85%
Fish per pound	13,654	16,550

Transition phase does not seem as critical to muskellunge fingerlings as it does to the more aggressive northern pike. There were no significant differences in percent survival during this phase for either diet, and in fact in the early phase of transition the BioVita diet outperformed Otohime in percent survival. Otohime-fed fish exhibit faster growth during the habituation phase, but there does not appear to be any reason to feed it for extended periods. When fish reached 4.5 inches in length they were introduced to fathead minnow forage. Fathead minnows were fed for the remainder of the growing season. Minnows were obtained from the seining and trapping efforts of Spirit Lake Hatchery personnel and were purchased from Oswald Fisheries, Inc., Ellendale, Minnesota. Fathead forage was provided daily and in constant supply. Muskellunge were fed dry diet for 59 days and a minnow diet for 96 days. Total growing season for muskellunge was 165 days. A total of 120,056 fish were transferred as two-inch fish, 12,233 were transferred at four inches, and 8,242 ten-inch fish were transferred to Rathbun Hatchery for over winter.

Production Results and Cost

Table 61 shows the distribution and sizes of fish stocked, while Tables 62 and 63 demonstrate production results and costs.

Table 61. *Distribution of muskellunge fry and fingerlings.*

Virginia	Green eggs	561,000
Minnesota Musky Farms	Swim-up fry	31,838
Michigan	2" fingerlings	75,232
Illinois	2" fingerlings	39,466
Rathbun Research	2" fingerlings	5,358
Missouri	4" fingerlings	7,655
Nebraska	4" fingerlings	4,578
Iowa	10" fingerlings	8,242

Table 62. *Production results and cost of intensively-reared muskellunge fingerlings fed a dry diet and finished on minnows*.

Number started swim-up fry	151,593
Pounds started	8.1445
Number removed (11.00 inch)	8,242
Pounds removed	1,630.85
Mean size (fish/lb.) (10 inches)	5.054
Percent survival	45.9%
Days fed dry diet	59
Days fed minnows	96
Pounds minnows fed	8,009.50
Pounds gained on minnows	1,532.46
Food conversion (on minnows)	5.23:1
Cost of minnows	$11,012.76
Total cost	$38,163.39
Cost per 1,000 fish	$3,539.65

For the third consecutive year, a class of Aquatic Animal Medicine from Iowa State University was conducted at the Spirit Lake Hatchery.

Approximately six high school students participated in job shadow opportunities at the hatchery throughout the year.

All shrubbery around the gazebo was replaced.

Two memorial benches were placed for fishing along the north shore of East Okoboji to provide fishing access for the general public.

Table 63. *Cost of all intensively-reared muskellunge.*

	Distribution						**Total**
	Over wintered at Rathbun Hatchery to be Stocked in Iowa Lakes (11.00")	**Illinois (1.48")**	**Michigan (1.15")**	**Rathbun Research (1.59")**	**Missouri (4.01")**	**Nebraska (4.09")**	
Total cost	$29,173.81	$1,497.70	$2,855.21	$498.32	$2,589.49	$1,548.96	**$38,163.48**
Number of fish	8,242	39,466	75,232	5,358	7,655	4,678	**140,631**
Cost/1000	$3,538.65	$29.29	$37.95	$81.57	$323.32	$316.49	
Cost per fish	$3.54	$0.03	$0.04	$0.08	$0.32	$0.32	
Cost of Iowa fish							**$29,173.81**
Cost of fish for others							**$8,989.67**

EVENTS AND IMPROVEMENTS

For the fourth consecutive year, a fish day for the entire Spirit Lake Elementary School was provided over a two-day period which allowed every student the opportunity to fish in pond 8 and learn about fish identification and casting.

For the eighth consecutive year, hatchery personnel taught basic aquatic ecology to an area high school in preparation for their competition in the Canon Envirothon.

MINNOW TRADING ACTIVITY

All musky/other species trades were completed in 2007 as listed in Table 64.

Table 64. *Fish trades for minnows with private producers*.

PRODUCER	**FISH TRADED**	**MINNOW EQUIVALENT**	**BALANCE**
Minnesota Musky Farms	31,838 swim-up muskellunge at $0.03 each for a total of $955.14	$955.14 at $10.00 per gallon = 96.0 gallons	96.0 gallons to be delivered to Rathbun Hatchery
BALANCE			**96.0 gallons**

2007
WEIGHT OR VOLUME OR COUNT OF FISH/TURTLES SOLD IN IOWA FROM LICENSED AQUACULTURE UNITS

In 2007, there were 65 aquaculture units licensed by the DNR to produce and sell fish and turtles in Iowa. Of these, all but 13 were located in Iowa. The thirteen out-of-state producers were from the states of Arkansas (2), Minnesota (3), Missouri (4), Nebraska (2), Oklahoma (1) and Wisconsin (1).

Producers are required to report the weight, volume or count of fish or turtles sold in Iowa. All three of these units combined give the total of reported fish or turtles sold in Iowa. These totals may include fish or turtles sold from one aquaculture unit to another and therefore not always the total stocked into Iowa waters. An aquaculture unit license may also be used for fee fishing areas and therefore no sales are reported for these types of operations.

One out-of-state and nine in-state producers or a total of 17%, failed to send in an annual report as required by Iowa Code. Of the 54 producers who did report, 23 producers or 43% of those reporting, indicated they did not sell in Iowa in 2007. Therefore, Table 65 is based on the 31 producers who reported sales.

Table 65. *Report of fish and turtles sold in Iowa from licensed aquaculture units in 2007.*

SPECIES	SIZE inches or pounds	WEIGHT Pounds	VOLUME gallons	COUNT	NUMBER OF PRODUCERS
Black crappie	2”-10”			156,498	8
Bluegill	2”-10”			343,404	10
Bluegill hybrid	2” - 6”			262,297	10
Brook trout	0.75 - 1 lb	927			1
Bullhead	10” - 12”	13,000			1
Channel catfish	4” - 16”	5,300		130,803	14
Fathead minnow	1” - 3”	8,419	4,833	60,000	14
Goldfish	1”- 8”	1,550	15	325,000	2
Koi	6” - 8”	450		145	3
Largemouth bass	2” - 15”			126,904	11
Muskellunge hybrid	12”			27	2
Northern pike	3” - 10”			523	2
Rainbow trout	10” - 24”	883		2,214	6
Redear sunfish	2” - 4”			112,450	5
Smallmouth bass	3” - 13”			9,509	2
Striped bass hybrid	3” - 5”			405	1
Tilapia	$1^1/_4 - 1^1/_2$ lb	40,871			2
Walleye	2” - 10”			643,702	8
White amur	6” - 12”			23,468	12
White sucker	4” - 6”		179		2
Yellow perch	3” - 6”			43,390	6
Common snapping turtle	Hatchling-?	810		174,047	9
Softshell turtle	Hatchling			32	1
Western painted turtle	Hatchling-?	14		25,808	5

Of the 52 in-state producers, 21 reported no sales and nine failed to send in a report for 2007. Therefore, Table 66 reports the production summary for the 22 Iowa resident aquaculture units reporting sales.

Table 66. *Report of fish sold in Iowa from in-state licensed aquaculture units in 2007.*

SPECIES	SIZE inches or pounds	WEIGHT Pounds	VOLUME Gallons	COUNT	NUMBER OF INSTATE PRODUCERS
Black crappie	2" - 10"			144,145	6
Bluegill	2" - 10"			220,392	7
Bluegill hybrid	2" - 6"			186,619	6
Channel catfish	4" - 16"			96,980	9
Fathead minnow	1" - 3"	7,490	1,743	60,000	9
Goldfish	1" - 8"	1,550		325,000	1
Koi	6" - 8"	450		145	3
Largemouth bass	2" - 15"			103,180	7
Muskellunge hybrid	12"			27	2
Northern pike	3" - 10"			523	2
Rainbow trout	10" - 24"			1,495	2
Redear sunfish	2" - 4"			93,935	3
Smallmouth bass	3" - 13"			9,509	2
Striped bass hybrid	3" – 5"			405	1
Tilapia	$1^1/_4 - 1^1/_2$ lb	40,871			2
Walleye	2" - 10"			639,402	7
White amur	6" - 12"			19,915	8
White sucker	4" - 6"		63		1
Yellow perch	3" - 6"			42,990	5
Common snapping turtle	Hatchling-?	810		174,047	9
Softshell turtle	Hatchling			32	1
Western painted turtle	Hatchling-?	14		25,808	5

Table 67. *2007 Fish stocking report.*

2007

IOWA
FISH STOCKING REPORT

SPECIES ABBREVIATION	SPECIES
BBH	BLACK BULLHEAD
BKT	BROOK TROUT
BKT (WI)	BROOK TROUT, ASH CREEK WISCONSIN
BLC	BLACK CRAPPIE
BLG	BLUEGILL
BRT	BROWN TROUT
BRT (FC)	BROWN TROUT, FRENCH CREEK
CCF	CHANNEL CATFISH
LMB	LARGEMOUTH BASS
MUK	MUSKELLUNGE
NOP	NORTHERN PIKE
RAT	RAINBOW TROUT
RES	REDEAR SUNFISH
SXW	SAUGEYE (SAUGER X WALLEYE)
WAE	WALLEYE
WAE-R	WALLEYE, MISSISSIPPI RIVER
WHA	WHITE AMUR
WXS	WIPER (STRIPED BASS x WHITE BASS)
YEP	YELLOW PERCH

Table 67. *2007 Fish stocking report. (Continued)*

SUMMARY OF FISH STOCKED INTO IOWA PUBLIC WATERS IN 2007		
SPECIES	**SIZE**	**NUMBER**
BBH	8.0”	2,000
BKT	3.7”-6.0”	32,965
BKT	2-3/lb	3,500
BLC	2.7”	3,000
BLG	1.0”-2.0”	357,472
BRT (FC)	2.0”-2.5”	161,250
CCF	2.4”-6.5”	99,723
CCF	7.0-10.0”	148,720
LMB	1.1”-4.2”	303,230
MUK	13.2”	3,335
NOP	Fry	354,998
NOP	2.2”-4.8”	56,943
RAT	2.8”-4.0”	65,000
RAT	2-3/lb	320,751
RES	1.5”	12,000
WAE	Fry	84,861,500
WAE	1.5:-3.5”	767,709
WAE	4.0”-6.0”	213,334
WAE	9.6”-10.0”	195,621
WAE-R	1.2”-1.6”	568,590
WHA	8.0”	17
WXS	Fry	1,000,000
WXS	2.0”-3.0”	12,475
YEP	3.5”	21,163

Table 67. *2007 Fish stocking report. (Continued)*

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Adair	Greenfield Lake	CCF	1,400	1,400	5.7"	5/29/2007	Rathbun
Adair	Meadow Lake	CCF	1,100	1,100	4.9"	5/29/2007	Rathbun
Adair	Mormon Trial Lake	CCF	1,100	1,100	5.7"	5/29/2007	Rathbun
Adair	Nodaway	CCF		400	8.5"	9/19/2007	Rathbun
Adair	Orient Lake	CCF	400	400	4.9"	5/29/2007	Rathbun
Adams	Binder	CCF		1,260	8.3"	9/17/2007	Rathbun
Adams	Corning Reservoir	CCF	250	234	8.3"	9/17/2007	Rathbun
Adams	Corning Reservoir	LMB	800	800	1.3"	6/13/2007	Fairport
Adams	Icaria	CCF	4,600	4,000	8.3"	9/17/2007	Rathbun
Adams	Icaria	LMB	25,000	25,000	1.3"	6/13/2007	Fairport
Adams	Icaria	LMB		3,900	4.2"	10/31/2007	Mount Ayr
Adams	Icaria	WAE	20,000	22,473	3.5"	6/29/2007	Rathbun
Adams	Icaria	WAE	6,500	5,856	10"	11/7/2007	Rathbun
Adams	Icaria Wetland (Zimmerman Area)	LMB		2,500	1.1"	6/13/2007	Fairport
Adams	Icaria Wetland (Zimmerman Area)	LMB		600	3.5"	3/22/2007	Mount Ayr
Allamakee	Clear Creek	BKT	200	140	2-3/lb	April - October	Big Spring
Allamakee	Clear Creek	BRT (FC)	4,000	4,000	2.1"	5/24/2007	Manchester
Allamakee	Clear Creek	RAT	2,600	2,326	2-3/lb	April - October	Big Spring
Allamakee	Hickory Creek	BKT	100	100	2-3/lb	April - October	Big Spring
Allamakee	Hickory Creek	RAT	1,300	1,378	2-3/lb	April - October	Big Spring
Allamakee	Little Paint Creek	BKT	1,760	1,581	2-3/lb	April - October	Big Spring
Allamakee	Little Paint Creek	RAT	13,740	13,079	2-3/lb	April - October	Big Spring
Allamakee	Paint Creek	BKT	480	782	2-3/lb	April-October	Big Spring
Allamakee	Paint Creek	RAT	7,620	7,094	2-3/lb	April-October	Big Spring
Allamakee	Patterson Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Allamakee	Patterson Creek	RAT	3,795	4,631	2-3/lb	AMJSO	Decorah
Allamakee	Pine Creek	BKT(WIS)	1,000	0			
Allamakee	Pine Creek	BRT (FC)	5,000	5,000	2.1"	5/24/2007	Manchester
Allamakee	Silver Creek	BRT (FC)	8,000	8,000	2.1"	5/24/2007	Manchester
Allamakee	Silver Creek	RAT	3,490	4,243	2-3/lb	AMJSO	Decorah
Allamakee	Teeple Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Allamakee	Waterloo Creek	BKT	510	374	2-3/lb	April-October	Decorah
Allamakee	Waterloo Creek	RAT	9,825	9,929	2-3/lb	April-October	Decorah
Allamakee	Wexford Creek	BKT	220	140	2-3/lb	April - October	Big Spring

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Allamakee	Wexford Creek	RAT	2,880	1,946	2-3/lb	April - October	Big Spring
Allamakee	Williams Creek	BRT (FC)	1,000	1,000	2.1"	5/24/2007	Manchester
Allamakee	Yellow River	BRT (FC)	50,000	50,000	2.0"	5/10/2007	Manchester
Allamakee	Yellow River	RAT	50,000	50,000	2.8"	5/30/2007	Manchester
Appanoose	Chariton River Wetland	BLG	40,000	40,000	1"	10/17/2007	Fairport
Appanoose	Chariton River Wetland	LMB	6,000	6,000	1.6"	6/19/2007	Fairport
Appanoose	CCB Ponds	LMB		1,200	4.2"	10/31/2007	Mount Ayr
Appanoose	Rathbun Reservoir	WAE	33,000,000	26,721,500	Fry	4/25-5/22/2007	Rathbun
Appanoose	Rathbun Reservoir	WAE		1,151	2.0"	6/15/2007	Rathbun
Appanoose	Rathbun Reservoir	WAE		533	4.0"	6/29/2007	Rathbun
Appanoose	Rathbun Reservoir	WAE	80,000	81,455	10"	9/7-11/1/2007	Rathbun
Audubon	Littlefield Lake	CCF	2,000	1,260	8.6"	9/19/2007	Rathbun
Benton	Cedar River	NOP	5,000	2,800	4.7"	6/1/2007	IL/Fairport
Benton	Hannen Lake	CCF	2,280	2,280	5.7"	6/6/2007	Rathbun
Benton	Rogers	CCF	2,000	2,000	5.7"	6/6/2007	Rathbun
Benton	Cedar River - Vinton	WAE-R	30,000	20,000	1.4"	5/24/2007	Fairport
Benton	Cedar River - Vinton	WAE-R		17,000	1.6"	6/7 - 6/13/2007	Genoa NFH
Black Hawk	Big Woods	CCF		1,210	8.0"	9/4/2007	Rathbun
Black Hawk	Cedar River	WAE-R	47,250	47,250	1.2"	5/24/2007	Fairport
Black Hawk	George Wyth	CCF		1,012	8.0"	9/4/2007	Rathbun
Black Hawk	George Wyth	NOP	500	280	4.8"	6/1/2007	IL/Fairport
Black Hawk	Greenbelt	CCF		396	8.0"	9/4/2007	Rathbun
Black Hawk	Meyers	CCF	730	468	8.0"	9/4/2007	Rathbun
Black Hawk	Mitchell	CCF	420	684	8.0"	9/4/2007	Rathbun
Black Hawk	North Prairie	CCF	280	180	8.0"	9/4/2007	Rathbun
Black Hawk	North Prairie	RAT	4,000	5,250	2-3/lb	NDJ	Big Spring
Black Hawk	South Prairie	CCF	620	533	8.0"	9/4/2007	Rathbun
Black Hawk	Wapsipinicon River	WAE-R	5,000	5,300	1.4"	5/23/2007	Fairport
Black Hawk	West Fork Cedar River	WAE-R	1,400	1,400	1.3"	5/24/2007	Fairport
Boone	Dickcissel Pond	CCF	300	122	8.3"	9/17/2007	Rathbun
Boone	Don Williams Lake	CCF	2,500	2,297	8.3"	9/17/2007	Rathbun
Boone	Jay Carlson Wildlife Area	CCF	1,200	998	8.3"	9/17/2007	Rathbun
Bremer	3-Rivers Pond	CCF	280	90	9.0"	9/25/2007	Rathbun
Bremer	Cedar River	WAE-R	31,500	31,500	1.5"	5/23/2007	Fairport

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Bremer	Plainfield Borrow	CCF	840	450	8.0"	9/4/2007	Rathbun
Bremer	Saints Lake	CCF	820	738	8.0"	9/4/2007	Rathbun
Bremer	Shell Rock River	WAE-R	4,720	4,720	1.3"	5/24/2007	Fairport
Bremer	Wilson Grove	CCF	280	90	9.0"	9/25/2007	Rathbun
Buchanan	Fontana Mill	CCF		762	8.0"	9/4/2007	Rathbun
Buchanan	Koutny	CCF		216	8.0"	9/4/2007	Rathbun
Buchanan	Wapsipinicon River	WAE-R	36,000	36,000	1.3"	5/24/2007	Fairport
Buena Vista	Gustafson	CCF	280	0			
Buena Vista	Little Sioux River	WAE	11,200	14,375	2.2"	6/14/2007	Spirit Lake
Buena Vista	Newell Pit	CCF	400	0			
Buena Vista	Storm Lake	CCF	9,000	2,698	7.5"-9.0"	9/27/2007	Rathbun
Buena Vista	Storm Lake	WAE		19,449	2.4"	6/27/2007	Spirit Lake
Buena Vista	Storm Lake	WAE	15,000	15,000	10"	10/22-11/8/2007	Rathbun
Buena Vista	Storm Lake	WAE	15,000	31,155	4"-6"	9/25+10/17/2007	Spirit Lake
Butler	Big Marsh	CCF		58	8.0"	9/4/2007	Rathbun
Butler	Shell Rock River	WAE-R	17,110	17,500	1.5"	5/23/2007	Fairport
Butler	Sportsmen's Pond	CCF	250	72	8.0"	9/4/2007	Rathbun
Butler	West Fork Cedar River	WAE-R	9,520	9,500	1.5"	5/23/2007	Fairport
Calhoun	Highway 4 Recreation Area	CCF	224	0			
Calhoun	North Twin	CCF	3,150	0			
Calhoun	North Twin	NOP	2,265	0			
Calhoun	North Twin	WAE		14,955	2.4"	6/29/2007	Spirit Lake
Calhoun	North Twin	WAE	8,000	8,472	5.0"	10/12/2007	Rathbun
Calhoun	Rainbow Bend	WAE	~~5,200~~				
Carroll	Four Corners	CCF	340	0			
Carroll	Hobbs Access	WAE	~~6,000~~				
Carroll	Swan Lake	BLC	500	550	Adult	5/1/2007	Management
Carroll	Swan Lake	CCF	2,000	1,901	9.0"	9/26/2007	Rathbun
Cass	Anita	CCF	2,000	2,000	5.9"	5/29/2007	Rathbun
Cass	Atlantic Quarry Ponds	CCF	500	0			
Cass	Cocklin Fish Farm	CCF	240	240	5.9"	5/29/2007	Rathbun
Cass	Cold Springs Lake	CCF	800	800	5.9"	5/29/2007	Rathbun
Cass	Cold Springs Lake	LMB	1,200	1,200	1.6"	6/19/2007	Fairport
Cass	Cold Springs Lake	LMB		80	3.5"	3/22/2007	Mount Ayr

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Cass	Cold Springs Lake	LMB		400	4.2"	10/31/2007	Mount Ayr
Cass	West Nodaway Pond	CCF	100	100	5.9"	5/29/2007	Rathbun
Cerro Gordo	Blue Pit	CCF	420	0			
Cerro Gordo	Blue Pit	RAT	4,500	7,035	2-3/lb	NDJ	Decorah
Cerro Gordo	Bluebill Lake (Ave Saints Pit)	CCF	1,120	0			
Cerro Gordo	Clark Lake (Zack Wildlife Area)	CCF	250	0			
Cerro Gordo	Clear Lake	CCF	11,000	9,805	7.5"	9/24+25/2007	Rathbun
Cerro Gordo	Clear Lake	MUK	600	600	13.2"	5/16/2007	Rathbun
Cerro Gordo	Clear Lake	WAE	16,000,000	15,900,000	Fry	5/1+2/2007	Spirit Lake
Cerro Gordo	Clear Lake	WAE	18,000	37,034	4.5"	9/27+10/17/2007	Spirit Lake
Cerro Gordo	Clear Lake	WAE	18,000	20,913	9.7"	10/17-26/2007	Rathbun
Cerro Gordo	Fin & Feather (Zack Wildlife Area)	CCF	280	0			
Cerro Gordo	Shell Rock River	NOP	2,600	2,602	2.2"	6/4/2007	Spirit Lake
Cerro Gordo	Shell Rock River	WAE		4,942	2.3"	6/22/2007	Spirit Lake
Cerro Gordo	Ventura Marsh	NOP	400,000	109,998	Fry	4/30/2007	Spirit Lake
Cerro Gordo	Winnebago River	NOP	6,800	6,822	2.2"	6/4/2007	Spirit Lake
Cerro Gordo	Winnebago River	WAE	2,000	2,080	2.2"	6/14/2007	Spirit Lake
Cherokee	Larson Lake	CCF	300	0			
Cherokee	Little Sioux River	WAE	7,600	7,722	2.2"	6/14/2007	Spirit Lake
Cherokee	Spring Lake	CCF	500	0			
Chickasaw	Airport Lake	CCF	280	144	8.6"	9/18/2007	Rathbun
Chickasaw	New Hampton Pond	CCF	140	36	8.6"	9/18/2007	Rathbun
Chickasaw	Ringneck Haven	CCF	336	72	8.6"	9/18/2007	Rathbun
Chickasaw	Split Rock Pond	CCF	280	126	8.6"	9/18/2007	Rathbun
Clarke	East Lake Osceola	CCF		252	8.0"	9/5/2007	Rathbun
Clarke	Q Pond	CCF		248	7.7"	9/14/2007	Rathbun
Clarke	West Lake Osceola	CCF	2,250	5,508	7.6"	6/7/2007	Rathbun
Clarke	West Lake Osceola	CCF		2,010	7.7"	9/14/2007	Rathbun
Clay	Little Sioux River	WAE	29,500	29,687	2.2"	6/12+14/2007	Spirit Lake
Clay	Little Sioux River	WAE	30,000	22,416	3.2"	8/2/2007	Spirit Lake
Clay	Sharnberg	LMB	500	500	4.2"	10/31/2007	Mount Ayr
Clay	Trumbull	NOP	5,000	5,024	2.5"	6/24/2007	Spirit Lake
Clayton	Bear Creek	BRT (FC)	1,000	1,000	2.1"	5/29/2007	Manchester
Clayton	Big Spring Hatchery Kid's Pond	BKT		469	2-3/lb	April - October	Big Spring

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Clayton	Big Spring Hatchery Kid's Pond	RAT		632	2-3/lb	April - October	Big Spring
Clayton	Big Spring Pond	BKT		95	2-3/lb	April - October	Big Spring
Clayton	Big Spring Pond	RAT		970	2-3/lb	April - October	Big Spring
Clayton	Bloody Run	BKT	1,140	1,320	2-3/lb	April - October	Big Spring
Clayton	Bloody Run	BRT (FC)	12,000	12,000	2.1"	5/24/2007	Manchester
Clayton	Bloody Run	RAT	5,000	5,000	4.0"	6/28/2007	Manchester
Clayton	Bloody Run	RAT	8,985	8,898	2-3/lb	April - October	Big Spring
Clayton	Buck Creek	BKT	390	520	2-3/lb	AMJSO	Big Spring
Clayton	Buck Creek	RAT	5,110	3,930	2-3/lb	AMJSO	Big Spring
Clayton	Bussey Lake, Mississippi River Pool 10	BLC		2,000	2.7"	10/25/2007	Genoa NFH
Clayton	Bussey Lake, Mississippi River Pool 10	YEP		7,348	3.5"	10/25/2007	Genoa NFH
Clayton	Guttenberg Ponds	NOP		4,000	Fry	4/5/2007	Guttenberg
Clayton	Hewitt Creek	BRT (FC)	3,000	3,000	2.1"	5/21/2007	Manchester
Clayton	Hewitt Creek	RAT	1,000	1,000	3.0"	5/30/2007	Manchester
Clayton	Joy Springs	BKT	1,000	955	2-3/lb	April-November	Manchester
Clayton	Joy Springs	RAT	8,500	7,889	2-3/lb	April-November	Manchester
Clayton	Maquoketa River	BKT	500	400	2-3/lb	April-November	Manchester
Clayton	Maquoketa River	BRT (FC)	4,000	2,000	2.1"	5/21/2007	Manchester
Clayton	Maquoketa River	RAT	3,500	3,125	2-3/lb	April-November	Manchester
Clayton	Miner's Creek	BRT (FC)	3,000	3,000	2.1"	5/24/2007	Manchester
Clayton	Mossey Glenn	BRT (FC)	1,000	1,000	2.1"	5/29/2007	Manchester
Clayton	North Cedar	BKT(WIS)	1,000	0			
Clayton	North Cedar	BRT (FC)	4,000	4,000	2.1"	5/24/2007	Manchester
Clayton	Osborne Pond	CCF	120	36	8.6"	9/18/2007	Rathbun
Clayton	Plum Creek	BRT (FC)	1,000	1,000	2.5"	6/28/2007	Manchester
Clayton	Sny Magill	BKT	1,140	1,370	2-3/lb	April - October	Big Spring
Clayton	Sny Magill	BRT (FC)	5,000	5,000	2.1"	5/24/2007	Manchester
Clayton	Sny Magill	RAT	10,110	10,324	2-3/lb	April - October	Big Spring
Clayton	South Cedar	BKT	130	110	2-3/lb	AMJSO	Big Spring
Clayton	South Cedar	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Clayton	South Cedar	RAT	2,070	1,590	2-3/lb	AMJSO	Big Spring
Clayton	St Olaf Spring	RAT	1,000	1,000	4.0"	6/28/2007	Manchester
Clayton	Swift Slough	NOP		5,000	Fry	4/6/2007	Guttenberg
Clayton	Big Spring Hatchery Kid's Pond	BKT		469	2-3/lb	April - October	Big Spring

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Clayton	Turkey River	RAT	12,740	7,777	2-3/lb	April - October	Big Spring
Clayton	Turkey River	WAE-R	9,600	9,500	1.4"	5/21/2007	Fairport
Clayton	Willow Creek	BRT (FC)	500	1,000	2.1"	6/8/2007	Manchester
Clinton	Hagenson Pond	CCF	200	0			
Clinton	Killdeer	CCF	180	0			
Clinton	Mississippi River	WAE	200,000				
Clinton	Rock Creek Wetlands	NOP		15,000	Fry	4/6/2007	Guttenberg
Crawford	Nelson Park	CCF	1,100	1,100	5.2"	5/24/2007	Rathbun
Crawford	Yellow Smoke	CCF	1,120	0			
Dallas	Beaver Lake	CCF	700	400	8.6"	9/20/2007	Rathbun
Dallas	Raccoon River - Dallas	WAE	8,000	5,332	1.5"	6/1/2007	Rathbun
Dallas	S. Raccoon River	WAE		2,666	1.5"	6/4/2007	Rathbun
Davis	Fisher Lake	LMB		5,000	1.7"	6/27/2007	Fairport
Decatur	Little River Lake	CCF	5,500	5,508	7.6"	6/7/2007	Rathbun
Decatur	Little River Lake	CCF		2,010	7.7"	9/14/2007	Rathbun
Decatur	Little River Lake	WAE	18,000	18,666	1.5"	6/1/2007	Rathbun
Decatur	Little River Lake	WAE	8,000	7,778	10"	10/18/2007	Rathbun
Decatur	Nine Eagles	LMB		300	3.5"	3/22/2007	Mount Ayr
Decatur	Slip Bluff	CCF		288	8.1"	9/5/2007	Rathbun
Delaware	Backbone	CCF		720	9.0"	9/25/2007	Rathbun
Delaware	Bailey's Ford	BKT	1,000	1,125	2-3/lb	April-November	Manchester
Delaware	Bailey's Ford	RAT	13,200	13,639	2-3/lb	April-November	Manchester
Delaware	Elk Creek	BRT (FC)	1,000	1,000	2.1"	5/29/2007	Manchester
Delaware	Fountain Springs	BKT	1,725	900	2-3/lb	April-November	Manchester
Delaware	Fountain Springs	RAT	13,875	12,868	2-3/lb	April-November	Manchester
Delaware	Grimes Hollow	BRT (FC)	500	500	2.1"	6/5/2007	Manchester
Delaware	Little Turkey	BKT		350	2-3/lb	April-November	Manchester
Delaware	Little Turkey	BRT (FC)	3,500	3,500	2.1"	6/5/2007	Manchester
Delaware	Little Turkey	RAT	2,000	1,900	2-3/lb	April-November	Manchester
Delaware	Maquoketa River	NOP	7,500	4,200	4.8"	6/1/2007	IL/Fairport
Delaware	Maquoketa River	WAE-R	23,560	23,500	1.3"	5/24/2007	Fairport
Delaware	Richmond Springs	BKT	1,725	1,790	2-3/lb	April-November	Manchester
Delaware	Richmond Springs	RAT	16,725	16,904	2-3/lb	April-November	Manchester
Delaware	Silver Lake	CCF		720	9.3"	9/25/2007	Rathbun

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Delaware	Spring Branch	BKT	2,000	2,000	3.7"	5/30/2007	Manchester
Delaware	Spring Branch	BRT (FC)	2,000	1,000	2.0"	5/21/2007	Manchester
Delaware	Spring Branch	RAT	2,000	2,000	3.0"	5/30/2007	Manchester
Delaware	Twin Bridges	BKT	100	500	2-3/lb	AMJSO	Manchester
Delaware	Twin Bridges	RAT	3,450	3,770	2-3/lb	AMJSO	Manchester
Des Moines	Big Hollow Ponds (5)	CCF	400	0			
Des Moines	Gahn Pond	CCF	75	0			
Des Moines	Gorge Pond	CCF	350	0			
Des Moines	Linder Pond	CCF	150	0			
Dickinson	Center Lake	CCF	2,700	0			
Dickinson	Center Lake	WAE	5,000	9,326	5.2"	8/14-10/18/2007	Spirit Lake
Dickinson	East Okoboji	CCF	5,500	0			
Dickinson	East Okoboji	WAE	6,500,000	6,450,000	Fry	5/3+4/2007	Spirit Lake
Dickinson	Little Swan	NOP	1,900	0			
Dickinson	Silver Lake	CCF	3,600	0			
Dickinson	Silver Lake	WAE	1,560,500	1,475,000	Fry	5/4/2007	Spirit Lake
Dickinson	Spirit Lake	MUK	850	852	13.2"	5/15/2007	Rathbun
Dickinson	Spirit Lake	MUK	1,700	0			
Dickinson	Spirit Lake	WAE	21,000,000	20,815,000	Fry	4/30-5/4/2007	Spirit Lake
Dickinson	West Okoboji	MUK	850	852	13.2"	5/15/2007	Rathbun
Dickinson	West Okoboji	MUK	850	0			
Dickinson	West Okoboji	WAE	20,000	18,294	10"	10/16-11/8/2007	Rathbun
Dickinson	West Okoboji	WAE	20,000	41,365	5.8"	9/20-10/12/2007	Spirit Lake
Dubuque	Bankston Creek - Lower	BKT	1,000	850	2-3/lb	April-November	Manchester
Dubuque	Bankston Creek - Lower	RAT	7,650	6,884	2-3/lb	April-November	Manchester
Dubuque	Bergfeld East	CCF		180	8.0"	9/4/2007	Rathbun
Dubuque	Bergfeld West	CCF		72	8.0"	9/4/2007	Rathbun
Dubuque	Heritage Pond	RAT	4,000	5,220	2-3/lb	NDJ	Big Spring
Dubuque	Hogan's Branch	BRT (FC)	500	500	2.1"	5/29/2007	Manchester
Dubuque	Little Maquoketa-So Fork	BRT (FC)	750	750	2.1"	5/29/2007	Manchester
Dubuque	Monastery Creek	BRT (FC)	1,000	1,000	2.1"	5/30/2007	Manchester
Dubuque	Mud Lake, Mississippi River Pool 11	BLC		1,000	2.7"	10/25/2007	Genoa NFH
Dubuque	Mud Lake, Mississippi River Pool 11	YEP		14,265	3.5"	10/25/2007	Genoa NFH
Dubuque	Swiss Valley	BKT	750	650	2-3/lb	AMJSON	Manchester

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Dubuque	Swiss Valley	RAT	9,500	8,832	2-3/lb	AMJSON	Manchester
Dubuque	White Pine Hollow	BRT (FC)	500	500	2.1"	6/5/2007	Manchester
Emmet	High Lake	NOP	2,300	0			
Emmet	West Fork DMR	WAE	25,500	47,649	2.3"	6/13+18/2007	Spirit Lake
Emmet	West Swan Lake	NOP	5,000	5,022	2.5"	5/24/2007	Spirit Lake
Fayette	Bass Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Fayette	Bear Creek	BKT	120	100	2-3/lb	AMJSO	Big Spring
Fayette	Bear Creek	RAT	1,380	1,220	2-3/lb	AMJSO	Big Spring
Fayette	Glover's Creek	BKT	1,140	1,250	2-3/lb	April - October	Big Spring
Fayette	Glover's Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Fayette	Glover's Creek	RAT	6,735	7,049	2-3/lb	April - October	Big Spring
Fayette	Grannis Creek	BKT	1,140	1,375	2-3/lb	April - October	Big Spring
Fayette	Grannis Creek	RAT	10,110	10,348	2-3/lb	April - October	Big Spring
Fayette	Mink Creek	BKT	60	123	2-3/lb	AMJSO	Big Spring
Fayette	Mink Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Fayette	Mink Creek	RAT	1,190	1,545	2-3/lb	AMJSO	Big Spring
Fayette	Otter Creek	BKT	390	670	2-3/lb	AMJSO	Big Spring
Fayette	Otter Creek	BRT (FC)	4,000	4,000	2.1"	5/24/2007	Manchester
Fayette	Otter Creek	RAT	2,000	2,000	4.0"	6/28/2007	Manchester
Fayette	Otter Creek	RAT	5,660	5,205	2-3/lb	AMJSO	Big Spring
Fayette	Turkey River	WAE-R	19,700	20,320	1.4"	5/23/2007	Fairport
Fayette	Volga Lake	CCF	2,700	1,890	8.6"	9/18/2007	Rathbun
Fayette	Brush Creek	BRT (FC)	2,000	2,000	2.3"	6/18/2007	Manchester
Fayette	Gilbertson Pond	CCF	280	54	8.6"	9/18/2007	Rathbun
Fayette	Lake Oelwein	CCF	650	422	8.0"	9/4/2007	Rathbun
Floyd	Cedar River	WAE-R	28,400	28,400	1.5"	5/21/2007	Fairport
Floyd	Fossil Rock	CCF	280	90	8.6"	9/18/2007	Rathbun
Floyd	Rudd Lake	CCF	336	0			
Floyd	Shell Rock River	WAE-R	15,400	15,400	1.5"	5/21/2007	Fairport
Franklin	Beeds Lake	CCF	2,000	0			
Franklin	Beeds Lake	NOP	1,000	0			
Franklin	I-35 Park Pond	CCF	700	0			
Franklin	I-35 Park Pond	LMB	750	750	4.2"	10/31/2007	Mount Ayr
Franklin	Maynes Grove	CCF	300	0			

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Franklin	Prairie Bridges	CCF	300	0			
Fremont	Bartlett	CCF	600	400	8.9"	9/12/2007	Rathbun
Fremont	Lake Virginia	CCF	250	180	8.9"	9/12/2007	Rathbun
Fremont	McPaul-North	CCF	200	180	8.9"	9/12/2007	Rathbun
Fremont	Percival	CCF	500	360	8.9"	9/12/2007	Rathbun
Fremont	Scott-South	CCF	300	180	8.9"	9/12/2007	Rathbun
Greene	Spring Lake	CCF	1,800	1,800	5.2"	5/22/2007	Rathbun
Grundy	Grundy County Lake	CCF	840	0			
Guthrie	Garst Ponds	LMB	350	350	1.6"	6/21/2007	Fairport
Guthrie	Middle Raccoon River	WAE	4,000	5,598	1.5"	6/1/2007	Rathbun
Guthrie	Springbrook Lake	CCF	700	252	8.6"	9/19/2007	Rathbun
Hamilton	Briggs Woods	CCF	1,650	0			
Hamilton	Little Wall	CCF	1,800	0			
Hamilton	Little Wall	LMB	2,560	2,100	4.2"	10/31/2007	Mount Ayr
Hamilton	Little Wall	NOP	1,290	0			
Hancock	Crystal Lake Sediment Pond	CCF	280	0			
Hancock	Eldred Sherwood (Indian Lake)	CCF	2,100	2,100	5.4"	5/23/2007	Rathbun
Hancock	Winnebago River	NOP	2,400	0			
Hardin	Iowa River - Iowa Falls/Steamboat	WAE	12,600	12,604	2.2"	6/14/2007	Spirit Lake
Hardin	Iowa River- Alden/Iowa Falls	WAE	3,000	3,005	2.2"	6/14/2007	Spirit Lake
Hardin	Pine Lake - Lower	CCF	1,400	0	.		
Hardin	Pine Lake - Lower	NOP	500	0			
Hardin	Pine Lake - Upper	CCF	1,930	0			
Hardin	Pine Lake - Upper	NOP	690	0			
Harrison	DeSoto Bend	CCF	6,000	0			
Harrison	DeSoto Bend	WAE	4,000	4,201	10"	10/16/2007	Rathbun
Harrison	Dunlap City Pond	BLG	5,000	0			
Harrison	Dunlap City Pond	CCF	200	180	8.6"	9/19/2007	Rathbun
Harrison	Saw Mill	CCF	150	150	4.9"	5/29/2007	Rathbun
Harrison	Schaben Pond	CCF	100	100	4.9"	5/29/2007	Rathbun
Harrison	Willow Lake	CCF	900	800	4.9"	5/29/2007	Rathbun
Henry	Geode	CCF	3,740	0			
Henry	Skunk River - Oakland Mills	WAE-R	4,000	0			
Howard	Bigalk Creek	BKT	200	168	2-3/lb	April-October	Decorah

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Howard	Bigalk Creek	RAT	2,000	2,000	4.0"	6/28/2007	Manchester
Howard	Bigalk Creek	RAT	4,495	4,823	2-3/lb	April-October	Decorah
Howard	Hendricks Lake	CCF	1,400	900	8.6"	9/18/2007	Rathbun
Howard	Taylor Pond	CCF	225	36	8.6"	9/18/2007	Rathbun
Howard	Turkey River	NOP	1,400	784	4.7"	6/1/2007	IL/Fairport
Howard	Turkey River	WAE-R	3,500	3,500	1.4"	5/21/2007	Fairport
Howard	Upper Iowa River	WAE-R	5,600	5,400	1.5"	5/21/2007	Fairport
Humboldt	Rearing Ponds	WAE	100,000	100,000	Fry	5/4/2007	Spirit Lake
Humboldt	W. Fork Des Moines River - Bradgate	WAE	12,000	14,525	2.3"	6/13+20/2007	Spirit Lake
Ida	Crawford Creek	CCF	1,725	0			
Ida	Moorehead	CCF	1,000	1,000	5.2"	5/24/2007	Rathbun
Iowa	Iowa River	NOP	5,000	2,800	4.7"	6/1/2007	IL/Fairport
Iowa	Iowa River - Belle Plaine	WAE-R	30,000	40,000	1.6"	6/7-6/13/2007	Genoa NFH
Iowa	Lake Iowa	CCF	4,500	4,500	5.7"	6/6/2007	Rathbun
Jackson	Big Mill Creek	BKT	500	850	2-3/lb	April-November	Manchester
Jackson	Big Mill Creek	RAT	7,900	6,859	2-3/lb	April-November	Manchester
Jackson	Brown's Lake	NOP		34,000	Fry	4/6/2007	Guttenberg
Jackson	Brush Creek	BKT	1,000	375	2-3/lb	AMJSON	Manchester
Jackson	Brush Creek	RAT	5,000	5,059	2-3/lb	AMJSON	Manchester
Jackson	Dalton Lake	BKT	500	225	2-3/lb	AMSO	Manchester
Jackson	Dalton Lake	RAT	3,250	3,649	2-3/lb	AMSO	Manchester
Jackson	Green Island Wildlife Area	NOP		42,000	Fry	4/6/2007	Guttenberg
Jackson	Little Mill Creek	BKT	200	350	2-3/lb	April-November	Manchester
Jackson	Little Mill Creek	BRT (FC)	1,000	1,000	2.1"	6/6/2007	Manchester
Jackson	Little Mill Creek	RAT	2,100	2,474	2-3/lb	April-November	Manchester
Jackson	Maquoketa River	WAE-R	12,400	12,500	1.3"	5/24/2007	Fairport
Jackson	Ozark Springs	BRT (FC)	500	1,000	2.3"	6/12/2007	Manchester
Jackson	Tete des Morts	BRT (FC)	1,500	3,000	2.3"	6/18/2007	Manchester
Jasper	Rock Creek	CCF	3,200	3,318	7.2"	9/24/2007	Rathbun
Jasper	Rock Creek	WAE	12,000	12,710	1.5"	6/1/2007	Rathbun
Jefferson	County Park Ponds (4)	CCF	100	0			
Jefferson	New Pond	CCF	125	0			
Jefferson	Round Prairie Ponds (2)	CCF	100	0			
Jefferson	Whitham Woods Pond	CCF	50	0			

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Jefferson	Zillman's Hickory Hills Pond	CCF	50	0			
Jefferson	Coralville Reservoir	LMB		21,800	1.1"	6/15/2007	Fairport
Johnson	Coralville Reservoir	SXW	30,000	0			
Johnson	Coralville Reservoir	WAE	5,430,000	2,000,000	Fry	5/1/2007	Rathbun
Johnson	Coralville Reservoir	WAE	79,500	122,359	1.5"	5/31+6/1/2007	Rathbun
Johnson	Coralville Reservoir/Macbride	WXS	50,000	0			
Johnson	Coralville Reservoir/Macbride	WXS	300,000	1,000,000	Fry	5/11/2007	Oklahoma/Byron
Johnson	Iowa River - Hills	NOP	5,000	2,800	4.7"	6/1/2007	IL/Fairport
Johnson	Kent Park Lake	CCF	3,900	3,900	5.7"	6/6/2007	Rathbun
Johnson	Macbride	CCF	9,400	4,095	7.0"	6/20/2007	Rathbun
Johnson	Macbride	CCF		5,312	8.5"	7/19+20/2007	Rathbun
Johnson	Macbride	MUK	940	681	13.2"	5/15/2007	Rathbun
Johnson	Macbride	MUK	259	0			
Johnson	Macbride	WAE	1,000,000	0			
Johnson	Macbride	WAE	28,000	57,171	1.5"	5/31+6/1/2007	Rathbun
Jones	Central Lake	CCF	1,600	1,600	5.0"	6/6/2007	Rathbun
Jones	Maquoketa River	WAE-R	22,320	22,000	1.6"	6/7-6/13/2007	Genoa NFH
Jones	Wapsipinicon River - Anamosa	NOP	5,000	2,800	4.7"	6/1/2007	IL/Fairport
Keokuk	Belva Deer Lake	CCF	2,600	0			
Keokuk	Belva Deer Ponds (4)	CCF	1,880	1,880	5.2"	5/21/2007	Rathbun
Kossuth	Algona Fishing Club	WAE	50,000	50,000	Fry	5/4/2007	Spirit Lake
Kossuth	E. Fork Des Moines River	WAE	16,000	16,506	2.3"	6/13/2007	Spirit Lake
Kossuth	Plum Creek Pits	CCF	170	0			
Kossuth	Siems Park	CCF	280	0			
Kossuth	Smith	CCF	2,950	2,950	5.4"	5/23/2007	Rathbun
Kossuth	Smith	LMB		6,000	1.8"	6/27/2007	Fairport
Kossuth	Smith	LMB	1,800	1,980	4.2"	10/31/2007	Mount Ayr
Kossuth	St. Benedict Pond	CCF	140	0			
Lee	Chatfield Pond	CCF	360	0			
Lee	Pollmiller	CCF	460	0			
Lee	Shimek Forest Ponds (5)	CCF	930	0			
Lee	Wilson Ponds (3)	CCF	500	0			
Linn	Cedar Bend Lake	CCF	1,200	0			
Linn	Cedar Lake	CCF	1,000	0			

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Linn	Cedar River - Mohawk Park	LMB		10,000	1.8"	6/29/2007	Fairport
Linn	Cedar River - Mohawk Park	WAE-R	30,000	30,000	1.6"	6/7-6/13/2007	Genoa NFH
Linn	Cedar River - Palo	NOP	5,000	2,800	4.7"	6/1/2007	IL/Fairport
Linn	Hwy 13 Pond	CCF	200	0			
Linn	McCloud Run	BKT	1,000	1,000	4.5"	6/11/2007	Manchester
Linn	McCloud Run	BRT	3,000	3,000	2.3"	6/11/2007	Manchester
Linn	McCloud Run	RAT	2,000	2,000	3.0"	6/11/2007	Manchester
Linn	Pleasant Creek	CCF	4,100	755	9.5"	6/20/2007	Rathbun
Linn	Pleasant Creek	CCF		3,362	10"	7/19/2007	Rathbun
Linn	Pleasant Creek	MUK	820	0			
Linn	Rock Quarry	LMB		5,000	1.7"	6/29/2007	Fairport
Linn	Wapsipicicon River - Troy Mills	WAE-R	10,000	10,000	1.4"	5/24/2007	Fairport
Linn	Wapsipinicon River - Pinicon Ridge	NOP	5,000	2,800	4.7"	6/1/2007	IL/Fairport
Linn	Wapsipinicon River - Pinicon Ridge	WAE-R	10,000	10,000	1.4"	5/24/2007	Fairport
Linn	Wapsipinicon River - Pinicon Ridge	WAE-R		17,000	1.6"	6/7/-6/13/2007	Genoa NFH
Linn	Wapsipinicon River - Stone City	WAE-R	10,000	10,000	1.4"	5/24/2007	Fairport
Linn	Wapsipinicon River - Stone City	WAE-R		18,000	1.6"	6/7/--6/13/2007	Genoa NFH
Louisa	Big Timber - Mississippi River	LMB		20,000	1.7"	6/29/2007	Fairport
Louisa	Iowa River - Fredonia	WAE-R	5,000	0			
Louisa	Langwood Park Lake	CCF	550	0			
Louisa	Odessa	CCF	19,048	0			
Louisa	Virginia Grove	CCF	220	0			
Lucas	Red Haw	CCF	720	722	9.0"	7/20/2007	Rathbun
Lucas	Williamson Pond	CCF	500	538	9.0"	7/20/2007	Rathbun
Lyon	Big Sioux River	WAE	47,760	98,076	2.1-3.0"	6/12+29/2007	Spirit Lake
Lyon	Lake Pahoja	LMB	1,500	1,500	4.2"	10/31/2007	Mount Ayr
Madison	Badger Creek	CCF	1,900	3,780	8.0"	9/5/2007	Rathbun
Madison	Badger Creek	LMB	1,200	0			
Madison	Criss Cove	CCF		180	8.0"	9/5/2007	Rathbun
Madison	Cedar Lake (Winterset City Res)	CCF	900	0			
Mahaska	Keomah	CCF	2,100	1,840	7.5"-9.0"	7/20+9/14/2007	Rathbun
Mahaska	Russel Pits	CCF	3,000	3,000	6.2"	5/24/2007	Rathbun
Mahaska	White Oak	CCF	450	0			
Marion	Marion CCB Lake	CCF	2,000	2,000	5.2"	5/22/2007	Rathbun

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Marion	Red Rock	WAE	10,000,000	6,000,000	Fry	4/30/2007	Rathbun
Marion	Roberts Creek	CCF	2,100	2,100	8.6"	9/18+19/2007	Rathbun
Marshall	Iowa River - Three Bridges	WAE-R	30,000	35,000	1.6"	6/7-6/13/2007	Genoa NFH
Mills	Fulsom	CCF	1,000	800	8.9"	9/12/2007	Rathbun
Mills	Glenwood	CCF	200	150	8.6"	9/19/2007	Rathbun
Mills	Keg Creek	CCF	1,000	900	8.9"	9/12/2007	Rathbun
Mills	Malvern City Pond	CCF	100	100	8.9"	9/12/2007	Rathbun
Mills	Mile Hill	CCF	300	250	8.9"	9/12/2007	Rathbun
Mitchell	Burr Oak Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Mitchell	Cedar River	WAE-R	32,550	33,200	1.4"	5/21/2007	Fairport
Mitchell	Cedar River (Pond)	NOP	10,000	10,000	Fry	4/6/2007	Guttenberg
Mitchell	Spring Creek	BKT	220	162	2-3/lb	April-October	Decorah
Mitchell	Spring Creek	RAT	3,765	4,164	2-3/lb	April-October	Decorah
Mitchell	Turtle Creek	BKT	260	200	2-3/lb	April-October	Decorah
Mitchell	Turtle Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Mitchell	Turtle Creek	RAT	5,785	6,210	2-3/lb	April-October	Decorah
Mitchell	Wapsipicicon River	BKT		18	2-3/lb	AMJSO	Decorah
Mitchell	Wapsipinicon River	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Mitchell	Wapsipinicon River	RAT	2,465	2,816	2-3/lb	AMJSO	Decorah
Monona	Blue Lake	BLG	270,000	247,472	1.5"	3/21/2007	Mount Ayr
Monona	Blue Lake	CCF	27,000	27,073	2.4"-6.5"	6/19/2007	Rathbun
Monona	Blue Lake	CCF		7,242	6.5"	6/19/2007	Rathbun
Monona	Blue Lake	LMB	27,000	30,710	1.2"	6/14/2007	Fairport
Monona	Blue Lake	NOP	2,700	0			
Monona	Johnston Pit	CCF	330	0			
Monona	Oldham	CCF	500	0			
Monona	Peters Pit	CCF	590	0			
Monona	Savery Pond	CCF	600	0			
Monroe	Albia (lower)	CCF	550	546	9.0"	7/20/2007	Rathbun
Monroe	Albia (upper)	CCF	875	874	9.0"	7/20/2007	Rathbun
Monroe	Miami Lake	CCF	3,500	3,498	5.3"	5/24/2007	Rathbun
Montgomery	Anderson Area Pond	CCF	200	270	8.9"	9/12/2007	Rathbun
Montgomery	Hacklebarney - East	CCF	200	270	8.9"	9/12/2007	Rathbun
Montgomery	Hacklebarney-West	CCF	100	90	8.9"	9/12/2007	Rathbun

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Montgomery	Pilot Grove	CCF	100	0			
Montgomery	Viking Lake	CCF	2,500	2,000	8.9"	9/12/2007	Rathbun
Montgomery	Viking Lake	LMB	9,500	9,500	1.2"	6/13/2007	Fairport
Montgomery	Viking Lake	LMB		300	3.5"	3/22/2007	Mount Ayr
Montgomery	Viking Lake	BLG		50,000	1.5"	3/21/2007	Mount Ayr
Montgomery	Viking Lake	RES		12,000	1.5"	3/21/2007	Mount Ayr
Montgomery	Viking Lake Watershed Ponds	LMB	1,000	1,000	1.6"	6/19/2007	Fairport
Muscatine	Kent Stein Park Pond	CCF	550	0			
Muscatine	Nature Center Ponds (2)	CCF	100	0			
O'Brien	Mill Creek Lake	CCF	1,000	1,000	5.3"	5/24/2007	Rathbun
O'Brien	Mill Creek Lake	LMB	2,500	2,500	1.6"	6/21/2007	Fairport
Osceola	Ocheyedan Pond	LMB	200	200	4.2"	10/31/2007	Mount Ayr
Osceola	Willow Creek Pond	CCF	1,000	1,000	5.3"	5/24/2007	Rathbun
Page	Pierce Creek Pond	CCF	1,000	594	8.9"	9/12/2007	Rathbun
Page	Pierce Creek Pond	LMB	3,300	3,300	1.3"	6/13/2007	Fairport
Page	Pioneer	CCF		36	8.9"	9/12/2007	Rathbun
Page	Ross Area East	CCF		216	8.9"	9/12/2007	Rathbun
Page	Ross Area West	LMB	500	500	1"	6/13/2007	Fairport
Page	Ross Area West	CCF		36	8.9"	9/12/2007	Rathbun
Page	Shennandoah	CCF	2,500	0			
Palo Alto	Five Island	WAE	15,000	15,103	5.4"	10/4+12/2007	Spirit Lake
Palo Alto	Lost Island	CCF	3,500	0			
Palo Alto	Lost Island	NOP	5,500	0			
Palo Alto	Lost Island	WAE	1,150,000	1,100,000	Fry	5/4/2007	Spirit Lake
Palo Alto	Silver Lake	NOP	3,000	1,859	2.5"	6/4/2007	Spirit Lake
Palo Alto	Sportsman Pond	CCF	1,000	0			
Palo Alto	Virgin Lake	NOP	1,000	0			
Pocahontas	Cooper's Cove	CCF	200	0			
Pocahontas	Plover Pit	CCF	200	0			
Polk	Ankeny City Ponds	CCF	450	450	8.6"	9/20/2007	Rathbun
Polk	Ankeny Lake	CCF	450	450	8.6"	9/20/2007	Rathbun
Polk	Big Creek	CCF	5,000	4,928	8.0"	5/20/2007	Rathbun
Polk	Big Creek	MUK	900	0			
Polk	Big Creek	WAE	6,000	6,033	9.7"	10/15/2007	Rathbun

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Polk	Blue Heron Lake	CCF	4,600	3,502	8.2"	9/5+20/2007	Rathbun
Polk	Blue Heron Lake	WXS	5,000	0			
Polk	Easter Lake	CCF	3,000	3,000	5.2"	5/22/2007	Rathbun
Polk	Easter Pond	LMB	4,000	4,000	1.1"	6/15/2007	Fairport
Polk	Easter Pond	WAE	50,000	50,000	Fry	4/30/2007	Rathbun
Polk	Fort Des Moines Pond	CCF	400	0			
Polk	Petoka	CCF	1,200	489	8.6"	9/20/2007	Rathbun
Polk	Saylorville Lake	LMB	10,000	25,000	1.1"	6/15/2007	Fairport
Polk	Saylorville Lake	NOP	75,000	85,000	Fry	4/5/2007	Guttenberg
Polk	Saylorville Lake	WAE	7,000,000	4,200,000	Fry	4/30/2007	Rathbun
Polk	Saylorville Lake	WAE		82,273	2.2"	6/20/2007	Spirit Lake
Polk	Saylorville Lake	WAE		40,128	4.0"	7/2/2007	Rathbun
Polk	Saylorville Lake	WXS	45,000	0			
Pottawatamie	Arrowhead	CCF	400	400	4.9"	5/29/2007	Rathbun
Pottawatamie	Big Lake Pond	BBH	500	500	8.0"	5/22/2007	MN/Carlson
Pottawatamie	Big Lake Pond	RAT	2,400	2,300	2-3/lb	Nov/Jan/Mar	Big Spring
Pottawatamie	Carter Lake	CCF	2,000	0			
Pottawatamie	Farm Creek Lake	CCF	300	0			
Pottawatamie	Manawa	CCF	5,400	8,000	8.6"	9/18+19/2007	Rathbun
Pottawatamie	Manawa	WAE	8,000	7,159	10"	11/6/2007	Rathbun
Pottawatamie	Manawa	WXS	8,000	8,643	2"-3"	6/18/2007	Mount Ayr
Pottawatamie	Saganush Pond	BLG	10,000	10,000	1"	10/11/2007	Fairport
Pottawatamie	Saganush Pond	CCF	150	0			
Pottawatamie	Saganush Pond	RAT	700	2,300	2-3/lb	Nov/Jan/Mar	Big Spring
Poweshiek	Arbor	CCF	280	0			
Poweshiek	Diamond Lake	CCF	7,000	3,500	5.5"	5/30/2007	Rathbun
Poweshiek	Diamond Lake	NOP	1,000	560	4.7"	6/1/2007	IL/Fairport
Poweshiek	Miller	CCF	200	0			
Ringgold	Game Area Ponds	CCF	225	324	8.0"	9/5/2007	Rathbun
Ringgold	Old Reservoir	CCF		180	8.0"	9/5/2007	Rathbun
Ringgold	Ringgold CCB Ponds	CCF	100	36	8.0"	9/5/2007	Rathbun
Ringgold	State Ponds	WHA	17	17	8.0"	10/17/2007	Fairport
Ringgold	Walnut Creek	CCF		1,080	8.0"	9/5/2007	Rathbun
Sac	Arrowhead	CCF	850	0			

COUNTY	WATER	SPECIES	2007 REQUEST	NUMBER STOCKED	AVG SIZE STOCKED	DATE STOCKED	HATCHERY
Sac	Black Hawk Lake	CCF	6,650	1,100	9.5"	9/27/2007	Rathbun
Sac	Black Hawk Lake	WAE		18,498	2.4"	6/27/2007	Spirit Lake
Sac	Black Hawk Lake	WAE	5,000	4,507	9.7"	11/7/2007	Rathbun
Sac	Black Hawk Lake	WAE	20,000	20,196	4.9"	10/4/2007	Spirit Lake
Sac	Black Hawk Pits	CCF	600	0			
Sac	Black Hawk Pits	NOP	1,000	0			
Scott	Bluegrass Park Pond	CCF	550	0			
Scott	Crow Creek Pond	CCF	900	0			
Scott	Lake-of-the-Hills	CCF	2,800	0			
Scott	Lake-of-the-Hills	RAT	4,500	4,500	2-3/lb	Nov/Jan/Mar	Big Spring
Scott	Lambach	CCF	450	0			
Scott	Lost Grove Silt Pond	LMB		2,000	1.7"	6/27/2007	Fairport
Scott	Railroad Lake	CCF	1,250	0			
Scott	Railroad Lake	LMB		20,000	1.7"	6/27+29/2007	Fairport
Scott	Wapsipinicon River (N. of Donahue)	WAE-R	3,000	0			
Scott	West Lake	LMB		20,000	1.7"	6/27+29/2007	Fairport
Shelby	George Pond	CCF	50	50	8.6"	9/19/2007	Rathbun
Shelby	George Pond	LMB		200	4.2"	10/31/2007	Mount Ayr
Shelby	Manteno Pond	CCF	300	270	8.6"	9/19/2007	Rathbun
Shelby	Nishnabotna Rec Area	CCF	200	500	8.6"	9/19/2007	Rathbun
Shelby	Pioneer Park Pond	CCF	50	50	8.6"	9/19/2007	Rathbun
Shelby	Prairie Rose Lake	CCF	4,000	0			
Shelby	Spearing Pond	CCF	50	50	8.6"	9/19/2007	Rathbun
Story	Dakins	CCF	300	300	8.6"	9/20/2007	Rathbun
Story	Hickory Grove	CCF	2,200	2,265	8.6"	9/20/2007	Rathbun
Story	McFarland's Pond	CCF	300	300	8.6"	9/20/2007	Rathbun
Story	Peterson Pit-West	CCF	1,400	1,000	8.6"	9/20/2007	Rathbun
Tama	Casey Lake	CCF	1,500	972	8.0"	9/4/2007	Rathbun
Tama	Iowa River	NOP	5,000	2,800	4.7"	6/1/2007	IL/Fairport
Tama	Otter Creek Lake	CCF	3,700	3,700	4.3"	5/30/2007	Rathbun
Tama	Union Grove	CCF	2,360	0			
Taylor	East Lake Lenox	CCF		630	8.9"	9/12/2007	Rathbun
Taylor	West Lake Lenox	CCF		180	8.9"	9/12/2007	Rathbun
Taylor	Three Fires	CCF		1,710	8.7"	9/12+19/2007	Rathbun

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Taylor	Wilson	CCF	500	306	8.9"	9/12/2007	Rathbun
Taylor	Windmill	CCF	700	396	8.9"	9/12/2007	Rathbun
Union	Afton	CCF	1,800	1,803	8.0"	6/12/2007	Rathbun
Union	Afton	CCF		320	7.7"	9/13/2007	Rathbun
Union	Afton	LMB	1,800	1,800	1.3"	6/13/2007	Fairport
Union	CCB Ponds	CCF		72	7.5"	9/13/2007	Rathbun
Union	Thayer	CCF	340	215	7.7"	9/13/2007	Rathbun
Union	Thayer	LMB	1,200	1,200	1.3"	6/13/2007	Fairport
Union	Thayer	LMB		60	3.5"	3/22/2007	Mount Ayr
Union	Three Mile	CCF	6,200	6,229	8.0"	6/12/2007	Rathbun
Union	Three Mile	CCF		5,128	7.5"	9/13+27/2007	Rathbun
Union	Three Mile	LMB		32,000	1.3"	6/13/2007	Fairport
Union	Three Mile	MUK	900	0			
Union	Three Mile	WAE	8,800	7,911	9.8"	10/24-11/5/2007	Rathbun
Union	Three Mile	WXS	5,000	3,832	2"-3"	6/18/2007	Mount Ayr
Union	Twelve Mile	CCF	6,500	6,529	8.0"	6/12/2007	Rathbun
Union	Twelve Mile	CCF		2,000	7.5"	9/13/2007	Rathbun
Union	Twelve Mile	LMB	32,000	30,800	1.6"	6/22/2007	Fairport
Union	Twelve Mile	WAE	6,500	5,852	10"	10/26-11/5/2007	Rathbun
Union	Union CCB Ponds	CCF	200	0			
Van Buren	Lacey Keosauqua State Park	CCF	1,100	0			
Van Buren	Lake Miss (Tug Fork W)	CCF	1,000	0			
Van Buren	Sugema Lake	MUK	600	0			
Van Buren	Sugema Lake	WAE	8,625	7,776	10"	11/1+9/2007	Rathbun
Wapello	Ottumwa Lagoon (proper)	CCF	3,500	0			
Wapello	Ottumwa Lagoon (proper)	LMB	3,500	0			
Wapello	Ottumwa Lagoons	CCF	2,000	2,000	6.0"	5/24/2007	Rathbun
Warren	Ahquabi	CCF	2,000	2,200	8.5"	9/21/2007	Rathbun
Warren	Banner Lakes - North	BLG	10,000	10,000	2.0"	3/29/2007	Fairport
Warren	Banner Lakes - North	CCF	1,800	1,890	8.0"	6/20/2007	Rathbun
Warren	Banner Lakes - North	LMB	1,200	1,200	1.1"	6/15/2007	Fairport
Warren	Banner Lakes - South	BBH	1,500	1,500	8.0"	5/22/2007	MN/Carlson
Warren	Banner Lakes - South	CCF	1,000	0			
Warren	Banner Lakes - South	RAT	5,000	8,640	2-3/lb	Oct/Nov/Jan	Big Spring

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Warren	Hooper Area	CCF	1,000	1,200	8.5"	9/21/2007	Rathbun
Washington	Schmitter Ponds (2)	CCF	200	0			
Washington	Skunk River - Brighton	WAE-R	4,000	0			
Washington	Skunk River - Coppock	WAE-R	4,000	0			
Washington	Washington County Ponds (7)	CCF	1,800	1,800	5.2"	5/21/2007	Rathbun
Wayne	Bob White	CCF	890	887	8.1"	9/19/2007	Rathbun
Wayne	Corydon	CCF	700	701	8.1"	9/19/2007	Rathbun
Wayne	Humeston	CCF	400	0			
Wayne	Pioneer Ridge Ponds	CCF	700	0			
Wayne	Seymour	CCF	750	750	8.1"	9/19/2007	Rathbun
Webster	Badger Lake	CCF	1,250	0			
Webster	Brushy Creek	CCF	4,900	0			
Webster	Brushy Creek	MUK	350	350	13.2"	5/16/2007	Rathbun
Webster	Brushy Creek	WAE		19,929	2.4"	6/29/2007	Spirit Lake
Webster	Brushy Creek	WAE	10,000	10,022	4.8"	10/4/2007	Spirit Lake
Webster	Brushy Creek	WAE	3,000	2,886	9.6"	10/22/2007	Rathbun
Webster	Des Moines River - below Ft. Dodge	WAE	42,000	49,257	1.5"	6/1/2007	Rathbun
Winnebago	Ambroson Pit	CCF	390	0			
Winnebago	Catherine Lake (Thorpe Park)	CCF	450	0			
Winnebago	Rice Lake	NOP	5,000	5,042	2.5"	5/24/2007	Spirit Lake
Winnebago	Rice Lake	WAE		30,131	2.3"	6/22/2007	Spirit Lake
Winnebago	Winnebago River	NOP	13,500	0			
Winneshiek	Bohemian Creek	BKT	200	168	2-3/lb	April-October	Decorah
Winneshiek	Bohemian Creek	BRT (FC)	1,000	1,000	2.1"	5/24/2007	Manchester
Winneshiek	Bohemian Creek	RAT	4,860	5,175	2-3/lb	April-October	Decorah
Winneshiek	Casey Spring	BRT (FC)	1,000	1,000	2.1"	5/24/2007	Manchester
Winneshiek	Coldwater Creek	BKT	380	260	2-3/lb	April-October	Decorah
Winneshiek	Coldwater Creek	RAT	7,240	7,130	2-3/lb	April-October	Decorah
Winneshiek	Coon Creek	RAT	2,605	2,622	2-3/lb	April-October	Decorah
Winneshiek	Dunnings Spring	BKT	500	500	6.0"	8/3/2007	Manchester
Winneshiek	East Pine Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Winneshiek	Lake Meyer	NOP	200	112	4.7"	6/1/2007	IL/Fairport
Winneshiek	Lake Meyer	CCF	1,120	720	8.6"	9/18/2007	Rathbun
Winneshiek	Madison Creek	BRT (FC)	1,000	1,000	2.1"	5/24/2007	Manchester

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Winneshiek	Middle Bear	BKT(WIS)	2,000	0			
Winneshiek	North Bear	BKT	1,450	1,034	2-3/lb	April-October	Decorah
Winneshiek	North Bear	RAT	13,300	13,362	2-3/lb	April-October	Decorah
Winneshiek	North Canoe	BRT (FC)	4,000	4,000	2.1"	5/24/2007	Manchester
Winneshiek	Pine Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Winneshiek	Silver Springs	CCF	120	36	8.6"	9/18/2007	Rathbun
Winneshiek	South Bear	BKT	1,000	792	2-3/lb	April-October	Decorah
Winneshiek	South Bear	RAT	12,595	12,915	2-3/lb	April-October	Decorah
Winneshiek	South Bear	BRT (FC)	5,000	5,000	2.1"	5/24/2007	Manchester
Winneshiek	Ten Mile Creek	BRT (FC)	2,000	2,000	2.1"	5/24/2007	Manchester
Winneshiek	Trout River	BKT	4,815	3,626	2-3/lb	April-October	Decorah
Winneshiek	Trout River	BRT (FC)	1,000	1,500	2.1"	5/24/2007	Manchester
Winneshiek	Trout River	RAT	2,005	3,483	2-3/lb	April-October	Decorah
Winneshiek	Trout Run	BKT	6,450	4,894	2-3/lb	April-October	Decorah
Winneshiek	Trout Run	RAT	6,450	9,420	2-3/lb	April-October	Decorah
Winneshiek	Turkey River	WAE-R	18,200	18,100	1.4"	5/21/2007	Fairport
Winneshiek	Twin Springs	BKT	465	345	2-3/lb	April-October	Decorah
Winneshiek	Twin Springs	RAT	7,025	8,188	2-3/lb	April-October	Decorah
Winneshiek	Upper Iowa River	WAE-R	16,900	16,600	1.5"	5/21/2007	Fairport
Winneshiek	West Canoe	BKT		96	2-3/lb	AMJSO	Decorah
Winneshiek	West Canoe	RAT	1,860	2,232	2-3/lb	AMJSO	Decorah
Woodbury	Bacon Creek Lake	CCF	950	0			
Woodbury	Bacon Creek Lake	RAT	5,000	5,000	2-3/lb	Nov	Big Spring
Woodbury	Brown's Lake	CCF	4,060	0			
Woodbury	Brown's Lake	NOP	2,900	0			
Woodbury	Little Sioux Park	CCF	1,300	1,300	5.3"	5/24/2007	Rathbun
Woodbury	Little Sioux River	WAE	5,000	5,242	2.2"	6/14/2007	Spirit Lake
Woodbury	Snyder Bend	CCF	2,800	0			
Woodbury	Snyder Bend	NOP	5,000	5,026	2.5"	5/24/2007	Spirit Lake
Woodbury	Southwood #1	CCF	525	525	5.3"	5/24/2007	Rathbun
Woodbury	Southwood #2	CCF	525	525	5.3"	5/24/2007	Rathbun
Worth	Kuennen Pit	CCF	330	0			
Worth	Shell Rock River	NOP	4,500	0			
Worth	Silver Lake	NOP	1,580	0			

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Worth	Worth County Lake	CCF	140	0			
Worth	Worth County Rearing Pond	NOP		50,000	Fry	4/5/2007	Guttenberg
Wright	Cornelia	CCF	4,860	4,860	5.4"	5/23/2007	Rathbun
Wright	Cornelia	WAE	7,290	7,413	2.2"	6/14/2007	Spirit Lake
	Illinois	MUK	30,000	39,466	1.5"	6/6/2007	Spirit Lake
	Michigan	MUK	30,000	75,232	1.1"	6/6/2007	Spirit Lake
	Minnesota Musky Farm	MUK	30,000	31,838	Fry	5/15/2007	Spirit Lake
	Missouri	MUK	7,500	7,655	4.0"	7/10/2007	Spirit Lake
	Nebraska	MUK	4,500	4,678	4.0"	7/11/2007	Spirit Lake
	Oklahoma DWC	WAE	1,000,000	1,000,000	Eggs	4/9/2007	Rathbun
	Virginia	MUK	100,000	561,000	Eggs	4/30/2007	Spirit Lake
Appanoose	Rathbun Research	MUK	5,000	5,358	1.6"	6/12/2007	Spirit Lake
Appanoose	Rathbun Research	WAE	200,000	145,000	Fry	5/2/2007	Rathbun
Appanoose	Rathbun Research	WAE	52,500	32,067	1.5"	6/1/2007	Rathbun
Appanoose	Rathbun Research	CCF	10,000	41,258	Fry	June	Rathbun
Appanoose	Rathbun Hatchery	MUK	8,000	8,242	10.9"	10/16/2007	Spirit Lake
Appanoose	Rathbun Hatchery	WAE	800,000	600,000	Fry	4/30/2007	Rathbun
Appanoose	Rathbun Hatchery	WAE	300,000	303,081	1.5"	6/1/2007	Rathbun
Dickinson	Spirit Lake Hatchery (nursery lakes)	WAE	3,400,000	3,100,000	Fry	5/4/2007	Spirit Lake
Dickinson	Spirit Lake Hatchery (intensive)	WAE	50,000	96,000	2.1"	6/12/2007	Spirit Lake
Dickinson	Spirit Lake Hatchery (Pond B)	WAE		2,915	2.7"	6/26/2007	Spirit Lake
Muscatine	Farm Pond	BLG	1,000,000	818,700	1"	10/2-11/2007	Fairport
Muscatine	Farm Pond	CCF	100,000	80,220	4"	10/2-11/2007	Fairport
Muscatine	Farm Pond	LMB	60,000	50,000	1.6"	6/19 + 21/2007	Fairport
Muscatine	Fairport Hatchery	WAE	1,500,000	1,250,000	Eggs	4/20+27/2007	Genoa NFH
Ringgold	Mount Ayr Hatchery	LMB	24,000	24,000	1.7"	6/27/2007	Fairport
Ringgold	Mount Ayr Hatchery	WXS	480,000	500,000	Fry	5/11/2007	Oklahoma/Byron
Worth	Worth County Lake	CCF	140	0			
Worth	Worth County Rearing Pond	NOP		50,000	Fry	4/5/2007	Guttenberg
Wright	Cornelia	CCF	4,860	4,860	5.4"	5/23/2007	Rathbun

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