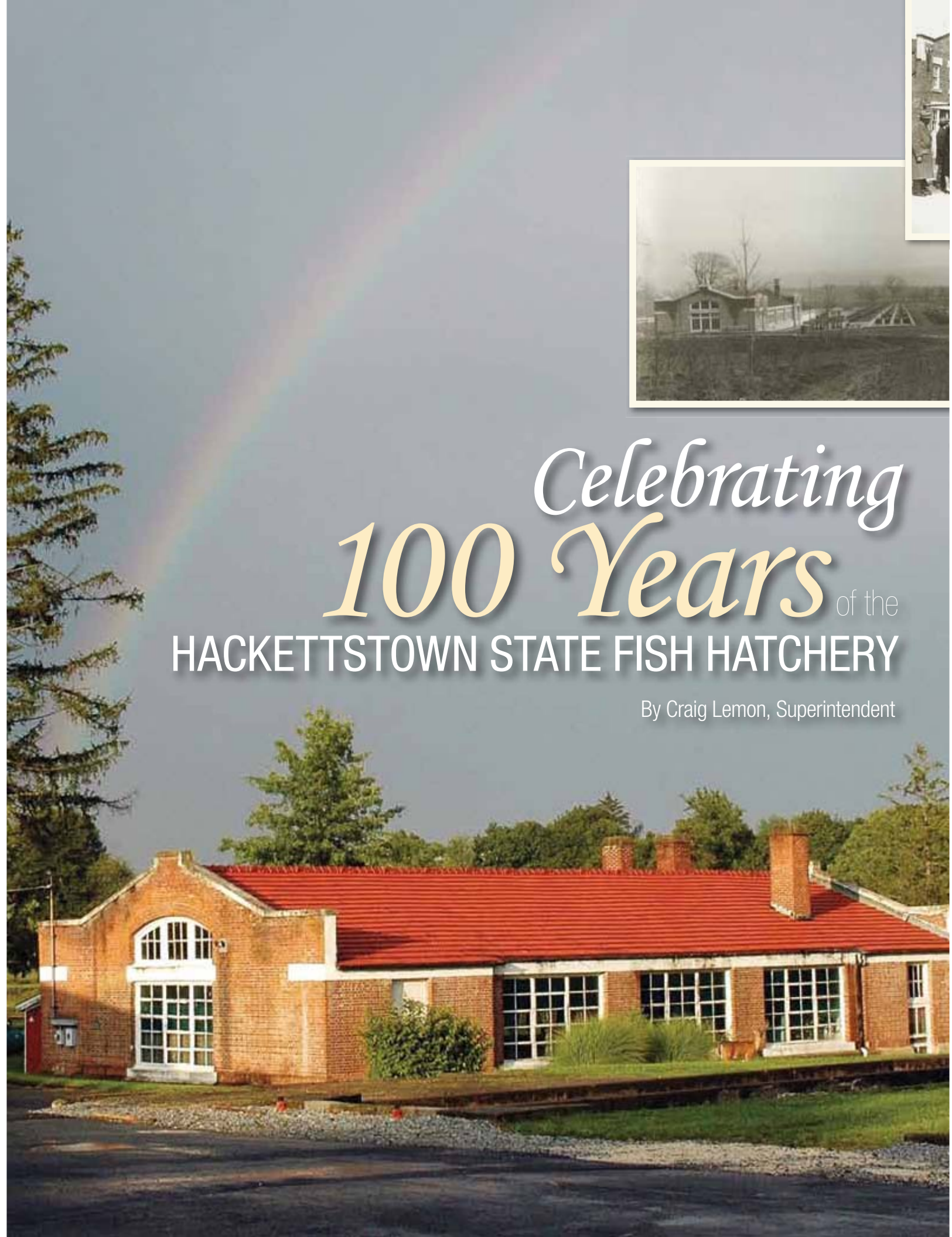


Celebrating 100 Years of the HACKETTSTOWN STATE FISH HATCHERY

By Craig Lemon, Superintendent

Circa 1920s opening day of trout season festivities.

Rows of McDonald hatching jars in the original intensive fish culture building.

Early fish stocking truck. Trout were transported in milk cans and drums kept cool with ice.

HUMBLE BEGINNINGS

While vacationing in Maine during the spring of 1911, Ernest Napier, president of the New Jersey Fish and Game Commission, observed 22-year old Charlie Hayford working at the Rangeley Lake Hatchery. Napier saw potential in Hayford, the newly appointed Superintendent who had *doubled* fish production while *cutting* costs at the New England fish hatchery. That same spring, while Hayford was still employed by the State of Maine, Napier and his colleague, Faunce, requested for Hayford to be on-loan to New Jersey to assist in the site selection for our new hatchery.

The Roberts Farm in Hackettstown was secured for the hatchery location along with several adjoining properties totaling 100 acres. This farm was chosen for its ample supply of pure, cool spring water, a running brook (Trout Brook) and convenient, nearby shipping capabilities. Several weeks later, the Commission appointed Hayford as the Hackettstown hatchery superintendent—at an annual salary of $900. The Charles Hayford reign would continue for forty five years.

Funded by a special appropriation of $30,000, workers using horses and shovels (none of today's heavy equipment) began construction in May of 1912. Initial work progressed slowly—hampered by red tape, required appropriation approvals and difficulty with obtaining the necessary bids from vendors. By July, the Commission drafted letters to *Governor* Woodrow Wilson, Treasurer Daniel Voorhees and State Comptroller Edward Edwards citing reasons for delays and requesting permission to construct the nursery buildings without first securing bids. The letter explained the critical need for the nursery building's timely completion as eggs ordered for a September delivery will take a prescribed time to incubate and hatch in order to meet the 1.5 million young trout needed for the following year. On July 26, just four months prior to being elected president, Governor Wilson approved the request.

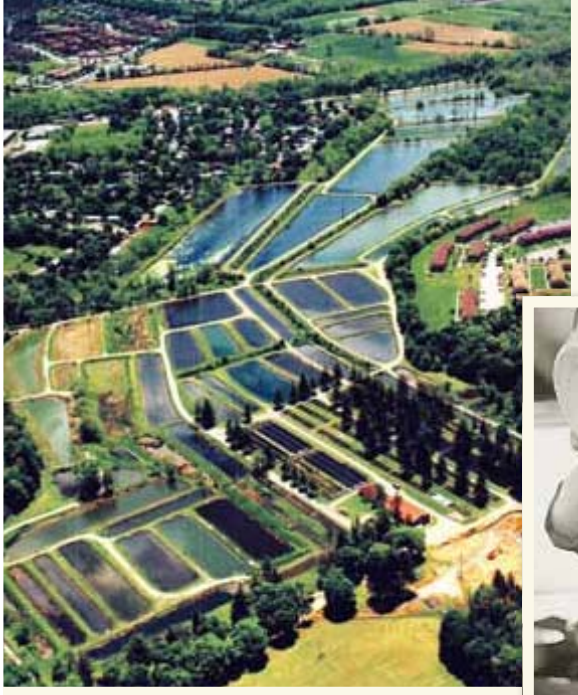
The Commission awarded the contract to I.N. Hoffman of High Bridge in the amount of $6,700 to construct the hatchery buildings. By December, the two main hatchery buildings, main culture building and hatch house were completed—just in time for the arrival of the first 100,000 eyed brook trout eggs from a Weissport, Pennsylvania Hatchery—for fifty cents per thousand. Less than a year later, 86,700 brook trout fingerlings were planted in New Jersey streams. These first fish from the new hatchery were driven by Hayford himself in a newly purchased chain-driven REO truck. The fish were transported in milk cans packed in ice to keep down water temperatures. The original main hatchery building still stands today and was used for the rearing of fish up until 1999.

Hatchery construction continued over several years with these additions: houses for the superintendent and assistant superintendent, a gate house, new spring houses, grinding house, ice house, carpenter shop, second nursery building, raceways and ponds. Hundreds of feet of iron pipe were laid to carry water from the springs and brook to the hatchery nursery buildings, raceways and ponds. Word spread of the hatchery's progress, drawing commissioners from numerous states to view the developing facilities. Vermont Fish and Game's Commissioner John Titcomb said after his visit, "You certainly have the largest trout hatchery I have ever seen. With the trout produced there and the bass which you will be able to produce when the ponds are completed, you will have, I believe, the largest fish cultural station in the country."

TRANSPORTATION

In April of 1914, the first attempt was made at shipping trout on railroad cars to south Jersey. New Jersey's first stocking of rainbow trout, weighing 1 to 2 pounds, were destined for Hammonton and Batsto lakes. The trout, contained within 75 milk cans that filled an entire baggage car along with an ample supply of ice, were loaded at midnight on the Delaware and Lackawanna R.R. Company's tracks in Hackettstown. By special arrangement, the railroad company picked up the car at 5 a.m. The fish car travelled to Phillipsburg, at 6:55 a.m. then to Jersey City at 9:14 a.m. for the final transfer onto the Atlantic City Express. Eight hours later, the rainbows—and accompanying wardens Park, Cudney and Young, who were kept busy aerating and icing the cans—arrived safely in south Jersey about 1 p.m. Only three fish perished during the trip. This early transportation success established this south Jersey rail run as part of the hatchery's annual stocking program.

By 1925, fish distribution methods improved exponentially after the purchase of four pneumatic tired trucks with enclosed cabs and special beds designed to hold two, 200-gallon galvanized iron tanks, each capable of carrying 650 catchable-sized trout. Ten years earlier, such a trip across the state to Bergen, Essex and Middlesex counties took two full days. With the new trucks and better roads, staff made the same trip twice in one day! These increased trucking capabilities marked the end of transporting fish by train in the Garden State. During the spring of 1926, staff distributed 600 truckloads of trout travelling 27,000 miles, completing the task by July. Today's stocking fleet makes 300 runs travelling 34,000 miles; spring stocking is now finished by the end of May.



Aerial view of the main Hackettstown Hatchery.

Hackettstown Hatchery's state-of-the-art intensive fish culture building constructed in the late 1990s.

Eggs are measured prior to placement into hatching jars.

ONLY THE BEST

Superintendent Hayford was the first in the United States to practice selective breeding on trout. From 1921 to 1932, hatchery workers chose for spawning only the best fish in size, shape and color. Selective breeding at Hackettstown resulted in our 16-month-old trout growing in length to 11 inches (compared with the usual 9 inches) and a doubling in weight! The first stocking of these selectively bred trout, reared from egg to adult, were stocked in 1917. In 1922, Ken Lockwood, sports editor for the *Newark Evening News*, questioned, "Is the state's scheme of stocking with fry and small fingerlings worth while?" His plea was for the "sane stocking of larger fish, not quantity but quality...." Around this time discussions surfaced about stocking catchable-sized fish during the open season, a consideration not met without criticism. The Commission was concerned that opening day stocks would be low or gone by the mid or later part of the season.

THE ROARING 20s

In 1918, a lower dam and spillway were constructed at the hatchery to allow the flooding of 20 acres of meadows, creating 5- to 8-foot deep ponds for raising smallmouth bass. Over 12 additional acres were purchased (the Thomas property) including a 4-acre lake and five large springs capable of filling a 12-inch pipe with 52 degree spring water. This additional lake and spring water supply allowed trout and bass production to increase. The hatchery now had seventeen independent chains of trout raceways, 156 pools in total. If placed one after another the raceways would reach 1.5 miles. These raceways required 2.25 million gallons of water to fill them all to a working level. The nursery building contained 100 hatching troughs and four egg batteries consisting of 600 jars.

Throughout the '20s, the Hackettstown hatchery annually stocked about 60 million fish. This huge number was inflated by the millions of yellow perch fry hatched and stocked each year. Hayford stated in 1923, "Every stream which possessed conditions capable of sustaining trout life has been stocked. During recent years the fame of our streams has spread to adjoining states and nonresidents join the tens of thousands of New Jersey sportsmen in trying their luck with rod and reel."

To meet the hatchery's growing needs, game wardens and hatchery personnel collected fish from state reservoirs, working from temporary, overnight summer camps. Using a boat, seine nets and a tank truck, 26 small truckloads of largemouth bass fry were netted and brought to the hatchery for propagation. A second warmwater species, the bluegill, was first propagated at the facility in 1924.

AN ADDITION TO THE EAST

In 1926 the Board of Commissioners approved additional land purchases on the eastern side of Hackettstown. Construction of the "East Hatchery" or "Rearing Pond Station" began in 1927 and by spring of the following year, five ponds were ready for fish. The ultimate goal was to build 28 ponds capable of producing two to three hundred thousand 8- to 10-inch trout annually, doubling current hatchery production. Ponds at the east hatchery, located near the town's Alumni Field, are still in production today.

THE HATCHERY GETS A "NEW DEAL"

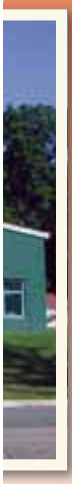
Oddly, the Great Depression brought a new wave of improvements at Hackettstown. President Franklin D. Roosevelt's New Deal created the Civilian Conservation Corp (CCC), a public work-relief program related to the conservation and development of natural resources on lands owned by federal, state and local governments. In October of 1933, CCC Camp #62 was established in Hackettstown. The camps were comprised of young men between the ages of 18 and 25 who enrolled for six-month time segments for a maximum of two years. The men were paid $30 a month and provided room, board and medical care. Over its seven year existence, CCC Camp # 62 built 76 trout and bass ponds, 15 concrete dams and over 50 concrete water control structures (flumes). They also constructed over 7 miles of dirt and gravel road, laid 3 miles of iron pipe and dug more than 3 miles of drainage ditches. This was in addition to clearing 40 acres of brush, laying 2,000 square yards of rip rap wall, seeding 2 miles of pond banks plus cleaning and re-grading 50 existing ponds.

THE END OF AN ERA

On March 31, 1956, after 45 years of serving the needs of New Jersey anglers, Hayford retired. Just three years prior on July 11, 1953, Governor Robert B. Meyner, officially dedicated the hatchery to Charles O. Hayford for his long-standing contributions to fish culture for the State of New Jersey. It must have been bittersweet for Hayford in that it was his son, Robert who replaced him as the hatchery's superintendent a month after the elder Hayford's retirement. Almost sixty years later, the hatchery's front gate still proudly carries his name.

FEEDING

Designing a feed program is an integral part of any fish culture operation and is a science unto



itself. During the hatchery's early years, staff conducted numerous feeding experiments to identify ways to reduce feed costs while still yielding healthy, good-sized trout. Back then, approximately four pounds of feed translated into a pound of trout. Young fry were strictly fed ground beef livers and calf hearts which provided high levels of protein, vitamins and minerals needed to spur growth. Once reaching fingerling size, the trout were switched to a diet of cow "plucks" (soft organs), pork welts (spleen), frozen herring, canned horsemeat and dry fish meal.

These food items were ground on site creating a soupy concoction, loaded each day into numerous five gallon pails and dispersed through the hatchery by staff designated as "feeders." Working the grinding room was not considered the highlight of one's career. Dry feeds comprised more and more of the trout's diet as advances were made in their formulation. By the mid-1970s dry feeds were used exclusively.

Although the dry feeds were easier to prepare and disperse they were not without drawbacks. Ed Washuta, Fish and Wildlife's retired fish pathologist, remembers the feeders "...slinging dry feed for eight hours a day, every day. It was a dirtier job than pond washing. The feed dust got everywhere—on clothing, skin and in every little crevice on the truck. At least once a week, usually more, Harold Gruver, West Hatchery feeder, would hose down his truck to flush out maggots from wherever they were hiding. When things got really bad, Gruver would joke that he had an easy day because the maggots would carry the bucket of feed to the pond for him."

TIME FOR A CHANGE

The late 60s and early 70s were troubling times for trout production at Hackettstown. Diseases such as whirling disease, infectious pancreatic necrosis (IPN) and bacterial gill disease (BGD) caused high trout mortalities. Despite these problems, 1973 saw a record number of trout raise at the hatchery: 660,247 fish. This record production was attributed to consistently high water flows, a mild winter and a strong feeding effort by hatchery personnel.

In 1972, test wells dug at the Pequest Rearing Station created optimism that water sources there would be sufficient to supply a future hatchery. Construction of the new Pequest Trout Hatchery began in 1978. In October of 1983, the *Sunday Register* headlines read "Hackettstown Trucks Make Final Trout Run." Beginning with the spring stocking in 1984, all brown, brook and rainbow trout were reared at the new Pequest Trout Hatchery located just nine miles from Hackettstown. Not only had trout production been discontinued at the older facility, but the Hackettstown hatchery—once a premiere tourist attraction with over 100,000 visitors annually—was officially closed to the public. Today, local residents of various ages fondly recall walking through the extensive grounds, viewing hatchery operations first hand.

The focus of energy at Hackettstown now shifted to rearing coolwater and warmwater species. Advances in culturing large trophy fish such as tiger muskies and northern pike, plus successful crosses that gave rise to hybrid striped bass, provided new fish culture processes to be explored. Newly created reservoirs such as Round Valley (1960), Spruce Run (1963), Monksville (1987), Merrill Creek (1988) and Manasquan (1990) built to meet New Jersey's growing drinking water demands but also provided fisheries biologists with just under 9,000 acres of potential fishing opportunity. To meet the stocking needs of all these new waterbodies, freshwater fisheries biologists Robert Papson, Robert Stewart and Art Lupine presented proposals for new species to be cultured. They knew that the deep waters of Round Valley and Merrill Creek reservoirs would provide excellent opportunities for establishing a lake trout population.

This was another exciting time in New Jersey's fish culture legacy. Our biologists learned new fish-rearing techniques that greatly diverged from those used in the first 65 years of coldwater production. The original shipment of tiger muskellunge eggs arrived from the Pennsylvania Fish and Boat Commission with plans to learn from this early coolwater fish-rearing experience. The goal: to develop suitable coolwater rearing techniques and facilities for future culturing of northern pike and purebred muskellunge. Methods were developed for brood stock collection using trap nets, spawning techniques, egg incubation and hatching procedures, dietary requirements for each species and tank densities to optimize fish growth. Those first few years of coolwater production were the foundation of today's successful northern pike, walleye and muskellunge programs.

The walleye program kicked off in 1989 with eggs received from Canada, Pennsylvania and New York. In all, 3.4 million eggs were incubated and hatched the first year. Over one million fry and fingerlings were stocked in Monksville Reservoir alone. As walleye production improved, additional waters such as Lake Hopatcong, Greenwood Lake and Swartswood Lake were added to the stocking requests. The early successful stockings of walleye in Lake Hopatcong were performed by the Knee Deep Club. Fish and Wildlife continued this stocking in later years.

New Jersey's muskellunge program was launched with the initial stocking of 3,900 5- to six-inch fingerlings procured in 1993 from the Pennsylvania Fish and Boat Commission. Brood stock collection from New Jersey waters for these large, toothy predators began in 1996 with the spawning of adult muskies captured in trap nets set in Monksville Reservoir and Greenwood Lake. Today, muskellunge over 50 inches are caught with increasing frequency by devoted muskie anglers.

At the same time great strides were being made in coolwater production, regional biologists also looked to fill a niche in warmwater fish production. Fry and fingerlings from Delaware, Virginia, South Carolina and Arkansas formed the basis of New Jersey's striped bass and hybrid striped bass programs. These fish were grown using three methods—intensively in fiberglass rearing tanks, extensively in earthen ponds and a combination of the two—until they reached a target stocking size of 4 inches. These bass species were brought to New Jersey's waters to target growing alewife populations in our largest, warmest (80+ degrees in the summer) waters. Today, Lake Hopatcong—along with Manasquan

EARLY DEDICATED FUNDS

On April 9, 1914, two years after the Hackettstown hatchery was constructed, one of the most important laws ever passed on behalf of fish and game species in New Jersey was enacted. **The Hunting and Fishing License Law** required the issuance of a $1.15 license to hunt with firearms and to angle for fish in the fresh waters of the state. All resident females—regardless of age—and resident males under the age of 14, were exempt from purchasing this sporting license which provided a revenue source to manage fish and game resources in New Jersey. At the time, it was the Fish and Game Commission's goal to utilize license revenue for hatchery and game farm maintenance so that not a penny of expense—once the facilities were fully established—would be borne by any other except the anglers and hunters of the state. This still holds true today.

Rows of fish-rearing tanks line the intensive building, capable of raising fish under three different water temperatures.

and Spruce Run reservoirs—support exceptional hybrid striped bass fisheries with specimens nearing ten pounds.

1990s BRING NEW IDEAS

In 1999, the aging Hackettstown facility underwent a major facelift. Actually, the upgrades were more akin to the surgical implantation of new, bionic parts. Following years of demolition and site cleanup, a new 12,500 square foot pre-engineered intensive fish culture building was constructed for the purpose of raising more and larger coolwater and warmwater fish. The $3.2 million building contains a state-of-the-art recirculation system, one of the first of its kind in the country. The system was designed to raise multiple species of fish using three different water temperatures under one roof.

- 52 degrees — lake trout
- 68 degrees — northern pike, muskellunge and walleyes
- 80 degrees — channel catfish, hybrid striped bass

With a recirculation system, heated water can be reused at levels as high as 80-90% efficiency, thereby reducing the number-one expense: *heating cold spring water.* The new system at Hackettstown is made up of 28 fish tanks made from a combination of fiberglass and plastic with a capacity of 30,000 gallons of water. The system flows 500–2,000 gallons-per-minute of water through PVC pipes into the rearing tanks. The used water or outflow then flows through a drum filter, then a biofilter and UV sterilizer where the solids are removed, ammonia is broken down and bacteria levels are reduced. The water is then reheated, aerated and pumped back through the fish tanks. Production at the new intensive building ended 87 years of fish culture within the hatchery's original building, one which still stands and currently serves as a meeting room for the Bureau of Freshwater Fisheries.

These improvements at Hackettstown fostered an impressive increase in coolwater and warmwater fish production. In 1986 the hatchery raised 50,000 fish weighing a total of 5,200 pounds. Contrast that with the first year's fish distribution from the new facility: 2.9 million fish raised totaling 18,300 pounds, representing a total of 15 species.

SWEAT AND LAUGHTER MAKE IT WORK

A common thread throughout the hatchery's 100-year history is the staff's high degree of commitment, performing whatever work was necessary to produce healthy, high-quality fish. Although it's impossible to show recognition for all the dedicated staff who have worked at Hackettstown, a few represent the commitment and importance of each individual employee who has worked the hatchery grounds.

Three amazingly dedicated workers each retired from the hatchery with over 50 years of service: John Wiley (general foreman), Art Skinner (stocking foreman) and Dan Gilroy (feeder). Former superintendent Jim Zamos remembers Wiley well, even fifty years later. "John may not have made it past the eighth grade, but he was one of the smartest persons I knew" said Zamos. Another reliable worker was Walt Wydner who served as the hatchery's night watchmen for over forty years. Wydner's job was to check the fish in each and every pond, throughout his eight-hour shift. According to Jim Zamos, "Wydner and his flashlight saved more fish than you could possibly count."

Ed Washuta, retired fish pathologist, also remembers Wydner well. Washuta marveled that Wydner could do the same thing, hour after hour, day after day, for over 40 years. "Walt had an amazing knack for noticing a change in fish behavior that most people couldn't see," said Washuta. "I always valued Walt's opinion," he added. During the summer months when oxygen levels are most critical, Wydner spent considerable time working each of the hatchery's four water pumps to maintain proper oxygen levels.

Willis Beatty, in charge of trout distribution planning and logistics for many years at Hackettstown, was an expert at crunching numbers. Long before calculators or computers, Beatty churned out numbers using adding machines plus stacks and stacks of yellow legal pads. Rumor had it that Beatty could tell you how many inches of trout were stocked each year by each distribution truck driver.

Unlike today at our hatcheries, historically each worker was responsible for a specific duty performed daily. Job titles included East Hatchery feeder, West Hatchery feeder, pond washer and others. Until 1982, from 25 to 33 workers were assigned full-time to the hatchery. All feeding, pond and raceway cleaning, sorting, netting and stocking was performed while the hatchery's 100,000 annual visitors looked on.

Looking back—and even looking forward—what will be remembered most is the sweat and the laughter. The "against all odds" mantra never held truer. Failure, as evidenced by all who worked at the hatchery, was never an option. Long, hard workdays; countless times retrieving a co-worker stuck in pond muck—pulled out by rope and a hatchery truck; many, many occasions when a hatchery vehicle slid into a pond; all-nighters spent listening to the drone of the back-up generator running after a power failure in order to maintain fish-rearing conditions; drilling through thick ice to feed trout in the winter; pitch-forking thousands of pounds of pond weeds to clear a path for the seine nets used to collect fish—all of this made for good stories and even better camaraderie among staff. And, all of this was all in a day's work.

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SUPERINTENDENTS of the Hackettstown Fish Hatchery

Three hatchery superintendents admire a handsome trout produced at the Hackettstown Fish Hatchery. They are (L to R) Robert Hayford (son), Charles O. Hayford and Jim Zamos.

CHARLES O. HAYFORD

SUPERINTENDENT: *May 1912 – March 1956*

Charles O. Hayford served as the hatchery's first superintendent. On loan from Maine in 1911, he was instrumental in selecting the hatchery's location, becoming it's first superintendent and overseeing the construction of the new hatchery buildings, raceways and ponds. Nicknamed "Fish Daddy," Hayford established a selective breeding program where only the largest and most well-conditioned trout were used for breeding, greatly improving the size of all future stocked trout. Hayford retired on March 31, 1956 after 45 years of service. In 1959 the Fish and Game Council, along with Governor Robert E. Meyner, renamed the hatchery in his honor, the Charles O. Hayford State Fish Hatchery. During his years as Superintendent, Hayford also served as president of the American Fisheries Society (1924) and was elected to be a lifetime honorary member in the society 28 years later.

ROBERT HAYFORD

SUPERINTENDENT: *April 1956 – March 1957*

Robert Hayford took over as hatchery superintendent after his father retired. The younger Hayford's interests were concentrated in fish pathology; he took particular interest in diagnosing why fish died. To this end, Hayford employed a private tutor—Dr. George Embody, a Cornell University professor—who spent many years at the hatchery conducting experiments in fish culture. Hayford also focused on culturing warmwater species such as bass. He remarked, "All species of fish must be utilized in some manner, for there is a place for each species in the program of good fish management." Superintendent for only one year, Hayford moved on to become chief of the Bureau of Freshwater Fisheries.

JAMES ZAMOS

SUPERINTENDENT: *April 1957 – June 1960*

Jim Zamos instituted the practice of taking monthly fish length measurements in each pond, providing accurate information to track