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The Bird Banding Laboratory: Support for and Collaboration with Research at Patuxent

By John Tautin

Located at Patuxent Research Refuge (PRR) and functionally part of the Patuxent Wildlife Research Center (Patuxent), Laurel, MD, the Bird Banding Laboratory (BBL) is the service and administrative center for bird banding in the United States. Over the years, the BBL has been associated with both the PRR and Patuxent, which collectively are commonly referred to by the public (and in this chapter) as “Patuxent.” The BBL issues permits and bands; supplies banding software, instructional materials, and technical advice; coordinates the use of auxiliary markers such as neck collars and radio transmitters; serves as the repository for banding records and the clearinghouse for reports of banded birds; disseminates data to researchers and managers; and assists in the development and coordination of banding projects. The BBL is a large and complex operation with a long and rich history that predates its transfer to PRR in 1942, when it began a remarkably successful and mutually beneficial collaboration with research and management functions colocated at PRR. Prior to 1961, the BBL was known simply as the “bird banding office.”

Bird Banding Begins: The Bird Banding Laboratory before Patuxent

Scientific bird banding began in 1902, when Smithsonian Institution scientist Dr. Paul Bartsch banded several black-crowned night-herons (*Nycticorax nycticorax*) along the Anacostia River in Washington, D.C. Bartsch used serially numbered bands with a Smithsonian return address on them and, in 1904, he published results from his banding study (Bartsch, 1904). In a prescient statement that began, “There are still many unsolved problems about bird life...” Bartsch suggested that bird banding would become a useful scientific tool.

Indeed, banding caught on quickly in the U.S. and Canada (Cole, 1922; Jackson, 2008). It was managed privately

until 1920, when the Federal bird banding office was established in Washington, D.C. Federal involvement in bird banding was both logical and welcome. The 1916 Convention between the U.S. and Great Britain (for Canada) for the Protection of Migratory Birds had established Federal pre-eminence in migratory bird matters, and the subsequent 1918 Migratory Bird Treaty Act made it law. The banding community actually encouraged the entry of the Federal government into the management of bird banding. World War I was underway, private support for banding had waned, and an entity with sufficient resources and authority to manage bird banding was needed. That entity was determined to be the already well-established U.S. Bureau of Biological Survey (Bureau).

The Bureau had some experience with bird banding (Wetmore, 1915), and Bureau administrators, notably Edward Nelson, Bureau Chief, and Harry Oberholser, head of bird studies, were supportive and recognized the need for a well-organized, central banding office. Therefore, in 1920, in arguably one of the most fortuitous appointments in the history of North American ornithology, they recruited Frederick C. Lincoln to organize the bird banding office (Tautin, 2008).

Lincoln was a remarkably accomplished biologist, writer, and administrator. By the end of the 1920s, he had organized the banding office, developed numbering schemes and record-keeping procedures, established standards, recruited bird banders, and fostered international cooperation. He was also a visionary who tirelessly promoted banding as a tool in scientific research and management. His contributions were significant and included the development of the Lincoln index (Lincoln, 1930; later modified to become the Lincoln-Petersen index), which ultimately proved to be a true population estimator (Nichols and Tautin, 2008), and the flyways concept (Lincoln, 1935), which is still applied in waterfowl management today. As his career progressed, Lincoln took on additional responsibilities, but he remained the primary official of the bird banding office until 1946, overseeing its transfer from Washington, D.C., to Patuxent in 1942. Lincoln retired in 1947, leaving a remarkable legacy. Much has been written about his career and achievements (Terres, 1947; Gabrielson, 1961; Reeves, 1984; Tautin, 2005). Frederick C. Lincoln truly was the founder of the bird banding program as we know it today.

The Bird Banding Office Moves to Patuxent

World War II prompted the move of the bird banding office to PRR. During the summer of 1942, in accordance with a decentralization order by President Roosevelt, the main offices of the U.S. Fish and Wildlife Service (USFWS) were moved temporarily to Chicago. However, the bird banding and other migratory bird files, together with the staff members who worked with those files, were moved to PRR (later Patuxent), where space in Nelson Laboratory was available.

After the war, the USFWS returned to Washington, D.C., but the bird banding office stayed at Patuxent, where it remains today, known as the BBL. The move to Patuxent was most fortunate for bird banding, because Patuxent would eventually become a world-class center for migratory bird research and management. The colocation of the bird banding office with scientists, who developed methods for analyzing banding data, and with management-oriented biologists, who used the data, proved to be mutually beneficial.

Lincoln remained in Washington, D.C., but retained administrative responsibility for the bird banding office through 1946. Management assistance at Patuxent was provided by May Thacher Cooke; two clerks, Marge Stewart and Lois Horn; biologist Chandler Robbins, beginning in 1943; and John Aldrich, who had transitional responsibilities between Lincoln's retirement and the appointment of Seth H. Low as the head of the bird banding office on January 5, 1948 (Steele, 1948; A.J. Duvall, 1968, unpublished letter on file at the U.S. Geological Survey Bird Banding Laboratory, Patuxent Wildlife Research Center, Laurel, MD). Low served in that capacity until 1954, when Allen J. Duvall transferred from the Museum of Natural History to PRR, where he was put in charge of migratory bird work, including the bird banding office. In a 1961 reorganization at Patuxent, the bird banding office was formally designated the Bird Banding Laboratory (BBL), and its leader, Duvall, was designated "Chief." Duvall



Seth Low, second chief of the Bird Banding Laboratory, Laurel, MD, 1951. Photo by Chandler S. Robbins, Patuxent Research Refuge.

remained BBL Chief until 1964, when he assumed a position with the Pesticides Review Board in Washington, D.C. The designations "BBL" and "Chief" remain today.

The internal written record of BBL's support for research during the tenures of Low and Duvall is relatively sparse, but that support was very likely given. Evidence exists in the form of external publications, notably two written by Aldo Leopold proteges Arthur S. Hawkins (1949) and Joseph J. Hickey (1952), who spent time at Patuxent researching the files at BBL.

Post-War Developments Influence Bird Banding

Outside the bird banding office during the late 1940s and 1950s, much was happening that would influence the office for decades to follow. As the Nation returned to "business as usual" after World War II, many young war veterans went to college under the Servicemen's Readjustment Act of 1944 (G.I. Bill), with increasing numbers entering the developing field of wildlife management. Surplus aircraft were made available for waterfowl surveys. Reliable funding from the Wildlife Restoration Act of 1937 (Pittman-Robertson Act) helped the States match the Federal Government's investment in waterfowl management. These efforts were stimulated by the resurgence of waterfowl hunting after G.I.s returned home and sporting ammunition became readily available. The development of cooperative bodies such as the four Flyway Councils furthered growth in waterfowl management. By 1960, State and Federal agencies were implementing cooperative, integrated, large-scale breeding ground surveys, harvest surveys, and banding programs specifically designed to yield data needed for waterfowl management. Martin and others (1979) and Hawkins and others (1984) provide interesting and comprehensive histories of these developments.



Allen J. Duvall, third chief of the Bird Banding Laboratory, Laurel, MD, 1961. Photo by U.S. Fish and Wildlife Service.



Laverne Casteline checking schedules, Bird Banding Laboratory, Laurel, MD, 1951. Photo by U.S. Fish and Wildlife Service.

Waterfowl Concerns Dominate at the Bird Banding Laboratory during the 1950s and 1960s

During the 1950s and 1960s, Patuxent became a leader in developing and managing surveys that supported research on and management of migratory game birds. In a supporting role, the BBL followed suit. The BBL adopted permit and data policies that clearly favored game-bird banding. Operational procedures were developed to accommodate game-bird interests; for example, banding and recovery records were modified to include codes for flyways, and all recovery records contained a “hunting seasons survived” code, even for nongame birds. Large numbers of waterfowl being banded reflected the emphasis on game-bird banding, and soon the mallard (*Anas platyrhynchos*) became the most frequently banded bird in North America, a distinction that it holds to this day.

The BBL modernized data management in the early 1960s, partly to better serve research and management, and partly in response to a disastrous fire that destroyed many paper banding records in 1959. Chan Robbins explains that few records were actually lost in the fire, but all the punch cards were distorted or singed from the heat and had to be replaced (Chandler Robbins, U.S. Fish and Wildlife Service, oral commun., 1983). BBL staff and other Patuxent personnel spent approximately 2 years reconstructing the file after the fire. Entry into the newly emerging field of electronic data management was accelerated in the mid-1960s with the installation of a modern IBM® computer capable of managing the now millions of banding records being used by scientists at Patuxent and other locations. Added impetus to modernization efforts at the BBL arrived in late 1964 with the appointment of the engaging and energetic Earl B. Baysinger as the fourth BBL chief.

By the mid-1960s, the importance of the BBL’s role in supporting research and management programs in the U.S. and Canada was recognized at the highest agency levels in Washington, D.C. In January 1967, the General Services Administration announced plans for the construction of a \$1.1 million Bird Banding Records Center at Patuxent (The Washington Post, 1967). Construction was completed promptly, and in 1968 the BBL was housed in its new, state-of-the-art home named Gabrielson Laboratory (U.S. Fish and Wildlife Service, 1972) in honor of Ira N. Gabrielson, an accomplished ornithologist, conservationist, and former director of the USFWS. Gabrielson Laboratory offered far more space than the BBL needed, and therefore was soon filled by other offices, including the Migratory Bird Populations Station and a burgeoning computer section. The BBL remains housed in Gabrielson Laboratory at Patuxent to this day (2016).

New Analytical Models Begin to Influence Bird Banding

During the 1960s, a quiet, but profound, revolution in banding data analysis had begun outside the BBL and Patuxent with the development of the Jolly-Seber-Cormack models (Nichols and Tautin, 2008). Statistically, these models were vastly superior to the then commonly used life tables. Over the next four decades, these new models would lead to a tremendous expansion of analytical methods that would further validate the importance of banding data, and therefore the BBL, to research. As was historically the case with many developments in bird banding, this one also was driven by game-bird management priorities. Waterfowl management and the setting of annual hunting regulations was becoming more complex, and Federal and State agencies needed more accurate scientific results from banding (Tautin, 1993).



Helen Webster punching return card, Bird Banding Laboratory, Laurel, MD, 1951. Photo by U.S. Fish and Wildlife Service.

The availability of these statistically reliable models, particularly the so-called Seber-Robson-Brownie models for estimating survival and recovery rates from band recovery data (Brownie and Robson, 1976), led to the publication of the eight seminal “Mallard Reports” by Patuxent scientists (for example, Anderson and Burnham, 1976). In the 1970s, two of those scientists, David Anderson and Ken Burnham, moved from Patuxent to Colorado State University and collaborated with Gary White to produce many more reports related to the analysis of bird banding data. In testimony to their enduring contributions to wildlife conservation, all three later received the Aldo Leopold Award, the wildlife field's most prestigious honor.

Nongame-Bird Banding Comes of Age

During the 1970s and 1980s, game-bird considerations continued to dominate the banding program, but several events caused nongame-bird banding to become more prominent. The Endangered Species Act of 1973 formally gave the USFWS responsibility for threatened and endangered birds, most of which were nongame birds. Universities and colleges began to employ more ornithologists and, by the end of the 1980s, nearly one-third of all banders had an academic affiliation. Research centers like Patuxent devoted increasing attention to nongame-bird species. As evidenced by the many published reports cited in the other chapters in this volume, Patuxent in particular became renowned for its work with both endangered and nonendangered birds.

Institutional banders at Patuxent and in the broader ornithological community, having more scientific knowledge than nonprofessional banders, commonly used auxiliary markers such as colored leg bands, neck collars, and radio transmitters that yielded additional and more accurate data. The BBL worked closely with them to ensure that advanced marking techniques were both effective and safe for birds. For some widely studied species, the BBL also worked with banders and other stakeholders to develop cooperative marking protocols. These cooperative efforts led to a great increase in observations of marked birds that supported the use of analytical models, which had moved rapidly beyond game-bird band recovery models to include more versatile mark-recapture models well suited for nongame-bird studies.

Nongame-bird banding received an additional boost during the 1970s and 1980s after George Jonkel became the fifth BBL chief in 1971. Jonkel had been with the USFWS for many years, and had been an active bander of both game and nongame birds. Under Jonkel's leadership, the BBL encouraged and supported nongame-bird research by both professional and amateur banders, and maintained close ties to the amateur regional banding associations.

Furthermore, during this era and into the next millennium, BBL chiefs and staff biologists, themselves licensed bird banders, also lent “hands-on” support to banding projects at Patuxent and other banding places. Some examples were

John Tautin's and B.H. Powell's tours of duty banding ducks in Canada under the cooperative pre hunting-season banding program, Kathy Klimkiewicz's decade-long study of wintering birds, Danny Bystrak's long-term study of fall migrants on the Patuxent powerline right-of-way, Mary Gustaphson's operation of a constant effort banding station under the USFWS continent-wide Monitoring Avian Productivity and Survivorship program, and Bruce Peterjohn's study of hummingbirds.

Science Triumphs over the Challenge of Administrative Changes

In late 1988, John Tautin became the sixth BBL chief. Tautin, a bander and a career employee with the USFWS Office of Migratory Bird Management (MBMO), had worked as a biologist at the BBL during the mid-1970s. During his tenure, which lasted until 2002, the BBL faced difficult administrative challenges following its transfer from the USFWS to the newly created National Biological Survey (later Service; NBS) in 1993 and later to the U.S. Geological Survey in October 1996. Fortunately, during these transfers the BBL remained at Patuxent, where its close ties with research scientists and the MBMO helped ensure that it would continue to receive sufficient resources to remain functional.



John Tautin, sixth chief of the Bird Banding Laboratory, Laurel, MD. 2009. Photo by Tara Dodge, Purple Martin Conservation Association.



Kathy Klimkiewicz capturing white-breasted nuthatch with color-coded band, Patuxent Research Refuge, Laurel, MD, 1977. Photo by Matthew C. Perry, U.S. Fish and Wildlife Service.

The importance of the BBL to research at Patuxent, and indeed to scientists across North America, was underscored in an extensive report (Buckley and others, 1998) by an external review panel commissioned by the NBS.

The review panel's report added impetus to ongoing efforts by the BBL to make the banding program more scientific. These efforts included re-engineering the BBL's database and computer operations, developing software for banders to manage and report banding data, designing a recapture/resighting database, and implementing a toll-free telephone number that people could call to report bird bands.

The internal efforts made by the BBL to improve the management of millions of banding records have typically gone unheralded, but their importance to Patuxent scientists and the broader ornithological community cannot be overstated. For example, banders commonly replace bands on long-lived birds when they recapture them. The bird then has two, if not more, unique band numbers assigned to it, causing

a record-keeping problem. Over the years, without direction or fanfare, BBL biologists, clerks, and computer staff developed ever better procedures for processing replaced bands, enabling scientists to maintain continuous records of the birds. Without these procedures, tracking the remarkable life of 62-year-old Wisdom, an albatross originally banded by Patuxent's Chandler Robbins in 1956 and subsequently rebanded several times, would not have been possible.

Among the BBL's efforts to improve operations, the toll-free number was a particularly important and successful development. In a late 1980s study, Patuxent scientists (Nichols and others, 1991) had determined that only 32 percent of hunters who killed a banded mallard actually reported the band. This low rate was inadequate to supply input to the data-hungry analytical models and adaptive management principles being applied in an effort to develop a more scientific approach to setting hunting regulations. Providing hunters with a convenient toll-free number to call for band reporting was the ideal solution to the need for more and better band-recovery data. The availability of the toll-free number doubled the reporting rate in only a few years.

During all of these operational developments, the BBL directly supported many individual Patuxent research projects (for example, Spendelov and others, 1995) and strengthened ties with Patuxent scientists. Some of these scientists were world leaders in developing ever more sophisticated models for analyzing banding and other data, while also developing new approaches to science-based decision making. Patuxent scientists Byron (Ken) Williams, James Nichols, and Michael Conroy cite many examples of their work in the monumental publication "Analysis and Management of Animal Populations" (Williams and others, 2002). The BBL helped by publicizing the new analytical models, participating in international technical conferences held to advance the models (Tautin, 1993; Tautin and others, 1999), organizing analytical workshops at ornithological meetings, and otherwise encouraging bird banders to use these powerful new tools.

Tautin retired from Federal service in late 2002. Succeeding BBL chiefs Monica Tomosy (2003) and Bruce Peterjohn (2008) and their staff continued the BBL's support of research at Patuxent and across North America. After completing the initial re-engineering effort at the BBL, they expanded Web-based procedures that improved data collection and distribution; developed Bandit software, which improved the efficiency of submitting banding data for both the banders and the BBL; and developed Web-based band reporting procedures that cut costs and facilitated bird-band reporting by the public. The BBL also modernized permit policies and expanded support for bird banding in Latin America. And, as it had always done, during Tomosy and Peterjohn's tenures, the BBL continued to work with scientists from Patuxent and elsewhere to develop and apply advanced technology for bird studies, most notably the use of geolocator data loggers, which revolutionized studies of migratory songbirds in 2007 (Stutchbury and others, 2009).

The Patuxent Wildlife Research Center Looks Ahead

The transfer of the bird banding office to PRR in 1942 marked the beginning of a highly successful and mutually beneficial collaboration with research and management functions colocated there. So long as the BBL and Patuxent remain viable and continue to coordinate work, it is reasonable to assume that this remarkable 70-year legacy will continue. Maintaining this relationship is desirable because, as Paul Bartsch noted when bird banding first began in North America, "There are still many unsolved problems about bird life...."

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G. Michael Haramis banding a male canvasback in Chesapeake Bay, 1978.
Photo by Matthew C. Perry, U.S. Fish and Wildlife Service.