PATRICK JAMES KENNEDY

Project Manager/Environmental Scientist

Mr. Kennedy is an environmental professional and project manager serving the planning, design, and construction needs of utilities, transportation, private/commercial developers, and government agencies throughout North America. Primary areas of expertise include ecological restoration, ecological assessments, habitat evaluations, threatened and endangered species, water quality modeling, statistical analyses of environmental data, hydrographic surveying, dredging, and local, state, and federal permitting.

EDUCATION

- MSc Biological Sciences – Aquatic Ecology, University of Manitoba (2017)
- BS Biological Sciences – Organismal Biology and Ecology, Illinois State University (2013)
- Continuing Education Graduate Student in Water Resources Management, Oregon State University (2020)

PROFESSIONAL MEMBERSHIPS

- National American Fisheries Society & Water Quality Section (2014-Present)

10+ YEARS OF EXPERIENCE

USACE PROJECT MANAGEMENT EXPERIENCE

Lower Green Bay/Fox River AOC Ecosystem Restoration Projects | USEPA/WDNR

Brown County, Wisconsin | 2023-Present

Project Manager for technical planning, design, and construction of multiple projects included in the draft management action list for the Lower Green Bay-Fox River Area of Concern (AOC): De Pere Dam Sturgeon Spawning Habitat and Riverine Wetland Restoration, Duck Creek Delta Wetland Complex Lacustrine Wetland Restoration, and Longtail Point and Dead Horse Bay Coastal and Lacustrine Habitat Restoration. WDNR developed the list in partnership with USEPA and AOC stakeholders over several years which aimed to meet beneficial use impairment removal targets for fish and wildlife habitat and population impairments. These projects aim to restore riverine, coastal, and lacustrine wetland and other aquatic habitats that support diverse native plant assemblages, provide essential fish and wildlife requisites, and protect against erosion. They will improve spawning and nursery habitats for recreationally important species (e.g., Muskellunge, Walleye), Wisconsin state species of concern (i.e., Lake Sturgeon), and potentially federal and state listed species, contributing to substantial biodiversity and functional improvements to Lower Green Bay-Fox River ecosystems.

Upper Des Plaines River and Tributaries Aquatic Ecosystem Restoration | LCFPD

Lake County, Illinois | 2023-Present

Project Manager for the design and construction of the Pollack Lake and Hastings Creek (Raven Glen) project that aims to restore rare and significant aquatic habitats throughout the 429-acre project area. This project will restore habitat for Federal and state listed species, restore natural and beneficial values of the floodplain, reduce/control/eradicate non-native species, and increase high quality habitat, biodiversity, and connectivity. Secondary objectives are to improve water quality for aquatic organisms and increase open space and recreational opportunities.

Dutch Gap Aquatic Ecosystem Restoration | LCFPD

Lake County, Illinois | 2023-Present

Project Manager for the design and construction of the Dutch Gap Aquatic Ecosystem Restoration project that aims to restore marsh, wet meadow, wet prairie, mesic and dry prairie, mesic and dry oak savanna, wet forest, flat woods, and open woodland habitats. It further aims to restore natural hydrology and geomorphology, improve water quality, increase plant

density and diversity, and improve habitat for fish and other fauna throughout the 785-acre site. The project will provide valuable stopover areas for migratory birds using the Mississippi flyway while also increasing connectivity by adding valuable patches of habitat within northern Lake County.

Horlick Dam Root River Restoration | Racine County Board of Public Works
Racine County, Wisconsin | 2023-Present

Project Manager for the feasibility study, design, and construction of the Horlick Dam Root River Restoration project that aims to restore riverine connectivity in the Root River watershed. The project further aims to restore riverine habitat in the area currently impacted by Horlick Dam and its associated impoundment. The removal of Horlick Dam will open access to 160 miles of river and tributary habitat upstream of the dam, as well as 6,176 acres of wetland habitat.

Johnsburg – Dutch Creek Aquatic Ecosystem Restoration | Village of Johnsburg
Lake County, Illinois | 2023-Present

Project Manager for the feasibility phase of the Johnsburg – Dutch Creek Aquatic Ecosystem Restoration project. This plan formulation phase aims to determine costs, benefits, and environmental effects of various restoration alternatives. By restoring hydrology, wetland vegetation, and structural habitat, this project could provide essentials for residential and migratory birds and other wildlife.

Port Washington Harbor North Breakwater Repairs | USACE
Port Washington, Wisconsin | 2023-Present

Project Manager for the design and construction of the Port Washington North Breakwater Repairs project. Port Washington is a deep draft commercial harbor with 4,769 feet of breakwater and pier structures. The work consists of placement of new armor stone and resetting existing armor stone as needed along the north breakwater to protect the integrity of the harbor.

Green Bay Harbor Dredging | USACE
Brown County, Wisconsin | 2023-Present

Project Manager for the annual design and dredging of Green Bay Harbor to maintain the integrity of the deep draft commercial harbor that is a major port on the Great Lakes. Annual surveys were used to determine areas of shoaling within the harbor channel, and these data were used to determine pertinent areas to dredge. Areas to be dredged were sampled to determine the quality of the sediment, and “clean” material was beneficially placed at the Cat Island dredged material management facility that is the site of various ecological restoration projects.

Green Bay Harbor Management of Dredged Material | USACE
Brown County, Wisconsin | 2023-Present

Project Manager for studies and an operations and maintenance manual to best manage placement of dredged material from Green Bay Harbor into the Cat Island dredged material management facility. This project aims to determine the amount of time and material it will take for placement of dredged material to reach desired elevations and characteristics for habitat restoration projects occurring at Cat Island. Further, this project aims to determine the requisite technical methods for placement and management of material to obtain desired outcomes. It will provide a timeline for how long Cat Island may serve as a dredged material management facility for dredged material from Green Bay Harbor.

PATRICK JAMES KENNEDY
(continued)

316(a), 316(b), HYDROGRAPHIC, AND AQUATIC RESOURCES STUDIES

316(b) Impingement Technology Performance Optimization Study | KCBPU
Nearman Creek Power Station, Kansas City, Kansas | 2021-2022

Aquatic ecologist for an impingement technology performance optimization study at the Nearman Creek Power Station along the Missouri River. This 2-year study involved sampling fish and shellfish off the facility's modified traveling intake screens and monitoring fish survival through the fish return system to demonstrate that the operation of the modified traveling screens has been optimized and is functioning properly to minimize impingement mortality of species. Responsibilities included data management, statistical analyses, and reporting.

Richland Creek Stream Surveys | Burns & McDonnell
Owen County, Kentucky | 2022

Aquatic ecologist for stream geomorphic and ecological surveys of Richland Creek and its intermittent and ephemeral tributary streams. Assessments were conducted to characterize the current state of the waterbodies so that natural stream channel restoration can be implemented to promote non-degrading channels and establish functioning aquatic and terrestrial habitats to improve the overall quality of Richland Creek and its distributary, Eagle Creek.

Desalination Plant Feasibility Study | Confidential Client
Victoria County, Texas | 2022

Aquatic scientist for feasibility level investigations to determine the suitability of a waterbody to serve as a water source and discharge location for a potential desalination plant. Efforts included bathymetry mapping of the waterbody, continuous water quality and water level monitoring, water velocity measurements, and desktop analyses to calibrate hydraulic and hydrodynamic models. Efforts included desktop analyses, field data collections, diffuser design, and hydrodynamic modeling of the effluent to evaluate its transport, dilution/fate, impacts to the waterbody, and permitting potential based on regulations.

316(b) 40 CFR 122.21(r) | University of Wisconsin-Milwaukee
Milwaukee County, Wisconsin | 2022

Aquatic ecologist for section 316(b) 40 CFR 122.21(r) reporting for the University of Wisconsin-Milwaukee's Heating and Cooling Plant that uses cooling water from Lake Michigan. The study includes characterizations of Lake Michigan's physical and biological state, an evaluation of the cooling water intake structure and water systems data, and an evaluation of the chosen method of compliance for reducing impingement mortality. Completed data acquisition, management, analyses, and reporting.

316(a) Variance Demonstration Study | Talen Energy
York County, Pennsylvania | 2021-2022

Aquatic ecologist and technical assistance for a thermal variance demonstration study for the Brunner Island Steam Electric Station on the Susquehanna River. The 2-year study includes winter fish sampling, aquatic habitat assessment within the Susquehanna River and discharge canal, water quality monitoring, winter observations of the thermal plume using infrared imagery via drone, and an analysis of risk to cold shock and evaluation of thermal tolerance characteristics of representative important fish species. Responsibilities included data management and analyses, GIS analyses, and reporting.

PATRICK JAMES KENNEDY
(continued)

Mixing Zone Study | NAVFAC NNSY
Portsmouth, Virginia | 2021-2022
Aquatic scientist for a mixing zone study in anticipation of proposed modifications to dry dock discharges at the Norfolk Naval Shipyard. The study includes CORMIX modeling under various design scenarios to establish dilution factors that can be applied for compliance with the facility's NPDES permit water quality criteria. Completed data acquisition, CORMIX modeling, and reporting.

Mixing Zone Study | NAVFAC Hawaii
Pearl Harbor, Hawaii | 2021
Aquatic scientist for a mixing zone study in anticipation of proposed modifications to dry dock discharges at the Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility. The study includes CORMIX modeling under various design scenarios to establish dilution factors that can be applied for compliance with the facility's NPDES permit water quality criteria. Completed data acquisition, CORMIX modeling, and reporting.

316(b) Evaluation Study | Madison Gas and Electric
Dane County, Wisconsin | 2021-2022
Aquatic ecologist and field lead for a comprehensive demonstration study for the Blount Generating Station that uses cooling water from Lake Monona. The study includes characterization of fisheries resources within Lake Monona, ichthyoplankton entrainment sampling at the cooling water intake structure, and evaluation of the engineering and technical feasibility of structural and operational measures and their effects on Lake Monona. Responsibilities included leading fieldwork, data management, analyses, and reporting.

316(b) 40 CFR 122.21(r) | NV Energy
Storey County, Nevada | 2021-2022
Aquatic ecologist for section 316(b) 40 CFR 122.21(r) reporting for NV Energy's Frank A. Tracy Generating Station that uses cooling water from the Truckee River. The study includes characterizations of the Truckee River's physical and biological state, an evaluation of the cooling water intake structure and water systems data, and an evaluation of the chosen method of compliance for reducing impingement mortality. Completed data acquisition, management, analyses, and reporting.

316(b) 40 CFR 122.21(r) | University of Wisconsin-Madison
Dane County, Wisconsin | 2021
Aquatic ecologist for section 316(b) 40 CFR 122.21(r) reporting for the University of Wisconsin-Madison's Charter Street Heating Plant that uses cooling water from Lake Mendota. The study includes characterizations of Lake Mendota's physical and biological state, an evaluation of the cooling water intake structure and water systems data, and an evaluation of the chosen method of compliance for reducing impingement mortality. Completed data acquisition, management, analyses, and reporting.

316(b) Evaluation Study | Talen Energy
Montour County, Pennsylvania | 2021
Aquatic ecologist and technical assistance for a comprehensive demonstration study for the Montour Power Plant that uses cooling water from the West Branch Susquehanna River. The study includes characterization of fisheries resources within the

river, ichthyoplankton and glochidia entrainment sampling at the cooling water intake structure, and evaluation of the engineering and technical feasibility of structural and operational measures and their effects on the West Branch Susquehanna River.

316(b) Evaluation Study | Hines - 300 N. LaSalle

Cook County, Illinois | 2021

Aquatic ecologist and field lead for an entrainment performance study for 300 N. LaSalle Drive that uses cooling water from the Chicago River. The study includes ichthyoplankton entrainment sampling at the cooling water intake structure. Responsibilities included leading fieldwork, data management, analyses, and reporting.

Cedar Lake Sediment and Eco-risk Assessment | Alliant Energy Corporation

Cedar Rapids, Iowa | 2021

Aquatic ecologist and technical assistance for a sediment and ecological risk assessment of Cedar Lake. The study included sediment sampling, spring and fall fish sampling, water quality sampling, fish tissue contaminants analyses, and aquatic habitat assessments within the different sections of Cedar Lake. Responsibilities included field surveys, data management, analyses, and reporting.

NPDES TMDL Study | Archer Daniels Midland

Clinton, Iowa | 2021-2022

Aquatic ecologist and field lead for a total maximum daily load (TMDL) effluent limit study for the Archer Daniels Midland Cogeneration Plant adjacent to Beaver Slough, a side channel to the Mississippi River. A TMDL was established in accordance with section 303(d) of the CWA to address impairment of the waterway for "aesthetically objectionable conditions" and "nuisance aquatic life". The project includes monitoring the presence and amount of *Sphaerotilus natans* upstream of the facility, downstream of the facility's wastewater discharge, and upstream of the City of Clinton wastewater treatment plant discharge along Beaver Slough. Monitoring data is compiled for multivariate analyses to see if plant operations, climate and ambient conditions are contributing to the abundance of slime in Beaver Slough. Responsibilities include leading field work, data management and analyses, and reporting.

Martins Creek NPDES Permit Renewal | Talen Energy

Bucks County, Pennsylvania | 2021

Aquatic ecologist and technical assistance for an NPDES Permit renewal application for Talen Energy's Martins Creek Steam Electric Station. Our team coordinated with the client and sub-contractors to complete required stormwater and wastewater sampling at permitted outfalls, organized pollutant concentration data, reviewed historical 316(b) data, reviewed plant operational history, and created GIS figures to support reporting and a NPDES Permit renewal application to the Pennsylvania Department of Environmental Protection and the Delaware River Basin Commission. Responsibilities included data management, analyses, and reporting.

Mussel Surveys

Stephenson County, Illinois | 2021

Aquatic ecologist and technical assistance for mussel surveys in several streams related to stream modifications for pipeline maintenance. Completed surveying, mussel relocation, data management, and analyses.

PATRICK JAMES KENNEDY
(continued)

Bathymetry Mapping | Kansas City Board of Public Utilities
Kansas City, Missouri | 2021

GIS specialist for bathymetric mapping of the Missouri River near the KCBPU Nearman Creek Power Station. Bottom elevations around the CWIS and the river near the facility were mapped and compared to previous bathymetric efforts using GIS to assess degradation of the river bottom and its potential effects on the CWIS.

Bathymetry Mapping | MidAmerican Energy
Council Bluffs, Iowa | 2021

GIS specialist for bathymetric mapping of the Missouri River near the Walter Scott, Jr. Energy Center. Bottom elevations were surveyed and mapped throughout a four-mile stretch of the river to support hydrologic models to assess potential impacts of scheduled water level changes on the facility's operations.

Bathymetry Mapping | Evergy
Weston, Missouri | 2021

GIS specialist for bathymetric mapping of coal-ash ponds at the Iatan Generating Station. Bottom elevations of coal-ash ponds were surveyed and mapped to determine the thickness of ash sediments and dredging efforts needed. Contour maps showing the elevation of the ash sediment were produced.

Sediment Sampling and Mapping | The Goodyear Tire & Rubber Company
Beaumont, Texas | 2021

Technical assistance for an environmental risk assessment of sediment in ponds at the Goodyear Tire & Rubber Company's facility in Beaumont, Texas. Responsibilities included creating bathymetric maps and figures in ArcGIS.

OTHER ENVIRONMENTAL PLANNING AND PERMITTING STUDIES

BASF McIntosh NPDES Permit | BASF Corp.
Washington County, Alabama | 2021

Technical assistance for a NPDES permit renewal for a chemical manufacturing facility in Washington County, Alabama, that discharges to the Tombigbee River. Responsibilities included creating figures in ArcGIS.

Solar Development Permitting Support | Vistra
Throughout Illinois | 2021-2022

Environmental scientist for planning and permitting support of solar-powered generation facility and battery energy storage system development in several counties throughout Illinois.

CWIS Demolition Permitting Support | Montana-Dakota Utilities
Mandan, North Dakota | 2021

Environmental scientist for permitting support of the demolition of a cooling water intake structure at the R. M. Heskett Station along the Missouri River.

PATRICK JAMES KENNEDY
(continued)

Vermillion Rise Wetland Delineations | Oriden LLC
Vermillion County, Indiana | 2021

Environmental scientist for wetland delineations in support of solar-powered generation facility development throughout Vermillion County, Indiana.

Hut Engineering Study | ComEd
Cook County, Illinois | 2021

Team member for a siting study throughout Illinois investigating potential electrical hut locations and any environmental and zoning regulations pertaining to site locations.

FISHERIES AND AQUATIC ECOLOGY RESEARCH AND MONITORING EXPERIENCE

Continuous Dissolved Oxygen Monitoring | MWRD Chicago
Cook County, Illinois | 2018-2021

Aquatic ecologist and technical assistance/ lead for continuous water quality monitoring of dissolved oxygen, temperature, and conductivity throughout MWRD's service area waterways for NPDES permit compliance. Completed field work, equipment calibration and maintenance, and data management and analyses.

Ambient Water Quality Monitoring | MWRD Chicago
Cook County, Illinois | 2018-2021

Aquatic ecologist and technical assistance for ambient water quality monitoring of various parameters throughout MWRD's service area waterways for NPDES permit compliance. Completed field collections, laboratory analyses, equipment calibration and maintenance, and data management.

Long-Term Biological Monitoring | MWRD Chicago
Cook County, Illinois | 2018-2021

Aquatic ecologist and technical assistance for fish and macroinvertebrate community surveys of rivers and streams throughout Cook County to monitor the health of biological communities within MWRD's service area waterways. Completed field and lab work, equipment maintenance, data management, analyses, and reporting. Independent research resulted in a peer-reviewed publication on the improved fishing quality of Chicago's waterways following the Clean Water Act.

Phosphorus Assessment and Reduction Monitoring | MWRD Chicago
Cook County, Illinois | 2020-2021

Aquatic ecologist and technical assistance for water quality monitoring throughout MWRD's service area waterways to identify evidence of unnatural plant or algal growth, as well as identify phosphorus input reductions and measures necessary to eliminate adverse conditions. Completed field and lab work, equipment maintenance, and data management.

Tinley Creek Restoration Biological Monitoring | MWRD Chicago
Cook County, Illinois | 2019-2020

Aquatic ecologist and technical assistance for fisheries and macroinvertebrate surveys before and after restoration of a section of Tinley Creek to reduce flooding in the Village of Crestwood. Completed field and lab work, data management, analyses, and reporting.

PATRICK JAMES KENNEDY
(continued)

Urban Rivers Wild-Mile Biological Monitoring | MWRD Chicago
Cook County, Illinois | 2018-2020

Aquatic ecologist and technical assistance for fisheries and macroinvertebrate surveys around floating island installations that provide aquatic habitat in a channelized section of the Chicago River. Completed field and lab work, data management, analyses, and reporting.

Mill Creek Mussel Survey | MWRD Chicago
Cook County, Illinois | 2020

Aquatic ecologist and technical assistance for a mussel survey related to a stream restoration project reconnecting Mill Creek to its watershed. Completed surveying, data management and analyses.

CAWS Microbiome Study | MWRD Chicago/Argonne National Laboratory
Cook County, Illinois | 2018-2019

Aquatic ecologist and technical assistance for water quality, sediment, and fish tissue sampling to characterize the microbial communities throughout the Chicago Area Waterway System. The study aimed to identify how water flows from different sources throughout the area and how rainfall affects the microbial communities.

NBCR Stream Delineation | Lake County Stormwater Management Commission/MWRD Chicago
Cook County, Illinois | 2019

Aquatic ecologist and field lead for stream delineation and mitigation of the North Branch of the Chicago River near the Lake-Cook County border. A geodatabase was compiled to identify areas of flooding concern and prioritize restoration efforts. Completed data management and field surveying of nearly 100 miles of streams.

Large River Fisheries Spatial and Movement Ecology | Southern Illinois University
Throughout Illinois | 2018

Fisheries biologist and field lead for several studies investigating the spatial and movement ecology of native and invasive fishes throughout the Upper Mississippi River Basin. This primarily included telemetry, hydroacoustic, and fish community surveys to further understand native and invasive fish ecology in large midwestern rivers and assist with fisheries management throughout the state of Illinois.

Fisheries Aging Contractor | IISD-Experimental Lakes Area
Winnipeg, Manitoba | 2017

Fisheries biologist solely responsible for preparing, aging, and digitizing images of Lake Trout otoliths and fin rays from dozens of research lakes at the IISD-Experimental Lakes Area in the Kenora District of Ontario, Canada.

Fisheries Aging Contractor | University of Manitoba
Winnipeg, Manitoba | 2017

Fisheries biologist solely responsible for preparing, aging, and digitizing images of Burbot otoliths from Fort Good Hope, Northwest Territories, Canada, for researchers at the Centre for Earth Observation Sciences.

PATRICK JAMES KENNEDY
(continued)

Whole-Ecosystem and Long-Term Limnological Monitoring | IISD-Experimental Lakes Area
Kenora District, Ontario | 2015-2017

Limnology research assistant for remote whole-ecosystem and long-term limnology research projects at the IISD-Experimental Lakes Area in the Kenora District of Ontario, Canada. Responsibilities included monitoring fish populations from dozens of glacial lakes, profiling lakes for various water quality parameters, maintaining facilities and equipment, and collecting daily meteorological data for the research camp.

Influence of the Prey Community on the Life History Variation of Aquatic Apex Predators in the Canadian Boreal Shield
Manitoba and Ontario, Canada | 2015-2017

Research scientist for studies investigating the impact of prey community dynamics on Northern Pike and Lake Trout growth and life history variation in the Canadian Boreal Shield. Efforts included modeling variation in life history traits of these species across hundreds of lakes, incorporating community dynamics, climate factors, and lake morphometry using several datasets from Ontario. Remote field research was also conducted to analyze changes in Lake Trout growth, condition, and resource use following aquaculture-induced alterations in lake oxy-thermal habitat and productivity at the IISD-Experimental Lakes Area. Research resulted in 4 peer-reviewed publications.

Illinois River Long-Term Biological Monitoring | Illinois Natural History Survey
Throughout Illinois | 2014

Aquatic ecologist for several projects investigating the fish community composition, ambient water quality, and zooplankton community composition of the Illinois River system.