ACADEMIC RESEARCH PAPERS

COMPARATIVE PHYTO-GEOGRAPHIC SURVEY OF PRESQUE ISLE

Original Research

A two part study. The preliminary work included qualitative and quantitative research identifying the woody Trees of Presque Isle and the associations of plants present. The densities, frequencies and dominances and their relative figures, as well as the importance values of all trees within ten separate study areas were calculated. A qualitative comparison was made between my research and studies prepared by john Miller, 1885; O.E. Jennings 1909; B. Ogden, 1993; and Father O'Toole, 1970. Two of the more obvious findings of the study showed that Presque Isle does not display a totally "natural" ecosystem and that its successional patterns are not as "unbroken and perfect" as O. E. Jennings maintained. 55 pages. Original charts, graphs and tables. Includes an original key to all the trees identified on Presque Isle.

A STUDY OF FUNCTIONAL ASPECTS OF THE SONG OF THE BLACK-CAPPED CHIKADEE

Original Research

The songs of a resident island population of Parus atricapillus were both qualified and quantified. The field data not appear to be an invitation to boundary disputes, since the need for two individuals to approach one another was shown to be statistically independent of the need to answer an original song. However, the need to answer was proven to be statistically significant. An elucidation of the function of the "fee-bee" song of P.atricapillus was attempted by comparing this study to others previous. The post breeding season song of P.atricapillus did a natural song was demonstrated to be statistically significant, as was the need to answer a recording of a natural song. 23 pages. Original charts, graphs and tables.

A CHEMICAL ANALYSIS OF A FARM POND IN NORTHWEST PENNSYLVANIA

Original Research

This study was designed to describe and analyze a ten-month old pond having a minimal amount of human involvement. A complete description of the ponds' physical, chemical and biological parameters was made using standard limnological procedures and instruments. The results of the findings were then analyzed with respect to the owner's purposes for the pond. A determination of the pond's relative health was then also pursued. The pond was determined to be progressing in a proper successional pattern although its low species diversity made it a fragile ecosystem, vulnerable to minor stressful insults. 26 pages. Original charts, graphs and tables.

PRESQUE ISLE: A SYSTEM UNDER CHEMICAL STRESS

Original Research

Data was collected determining the densities, frequencies, dominances and importance values for all woody trees on Presque Isle and analyzed from the perspective of biological stress. The major non-successional stress to the system appears to be inundation and drought. These two factors are the major forces straining individuals, altering successional patterns and limiting the species complexes. Therefore, the cyclic high water patterns of Lake Erie assume a major role in creating and maintaining the varied habitats on Presque Isle. 46 pages. Original charts, graphs and tables.

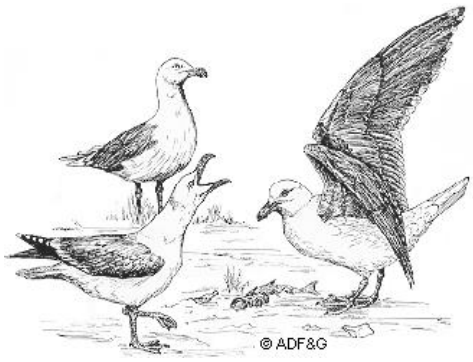
AGENCIES WHO'S ACTIONS IMPACT THE FISHERY OF LAKE ERIE AND PRESQUE ISLE BAY

Original Research

Researched those agencies whose actions impact , or have the potential to impact the fisheries of Lakes Erie and Presque Isle Bay. Fishery Management of the commonwealth waters of Lake Erie and Presque Isle Bay was discussed while all of the permitted discharges of sewer and industrial wastes were identified and reviewed. 162 pages. Tables and charts reproduced from Commonwealth of PA documents and credited

DYNAMICS OF A NATURAL GULL POPULATION ON PRESQUE ISLE BAY

Original Research



The gull and tern populations of Presque Isle State Park and Presque Isle bay were observed and recorded from the first of August, 1978 through February 1979. The majority of the gulls were Herrings (Larus argentatus) and Ring-billeds (Larus delawarensis) with the former outnumbering L. argentatus approximately 10:1. This ratio was maintained throughout the study period as the total populations rose and fell. The Herring Gulls (L. argentatus) reached a high of 6,000 on December 8 and the Ring-billed gull (L.delawarensis) population reached its maximum of 30,000, on December 17. The populations rapidly declined in January with no gulls being sighted on several dates later in that month. Ecological explanations for the populations observed were derived from an extensive literature search. 86 pgs. Original charts, graphs & tables.

THE CHEMICAL INFLUENCE OF A MAJOR INDUSTRIAL PROJECT ON THE ICHTYOFAUNA OF LAKE ERIE

A literature review of how Lake Erie, in the last 150 years, has eutrophied far beyond its geological age. This is due primarily to the great amounts of nutrients added to the lake waters from the western river watersheds. This over fertilization has. not only increased the number of total fish and its poundage, but also aided an increase in total number of competing species. As a result there has been massive over fishing of the more desirable species. The probable impact of a major industrial complex on the south shore of the central basin will be minimal compared to the aforementioned perturbations. The impact on the ichthyofauna (fish) will be minimized by the monitoring of industrial aqueous and gaseous effluents by agencies.

THE CHEMICAL EFFECT OF LOW FLOW AS A PERTUBATION UPON THE AQUATIC INSECT COMMUNITY OF LINESVILLE CREEK

Original Research

A swiftly flowing stream was split directly down the middle with one half being allowed to remain at its “normal” 4803 cm/sec flow rate, while the other half was reduced to no observable or measurable flow. The aquatic insect community was monitored to determine any migration out of the new zero flow, “lentic” side of the stream. Migration did take place. The flow rate, or lack of it, was determined to also change chemical and thermal nature of the two sides. The question remains whether the flow rate, chemistry or temperature was the primary determining factor. 16 pages Original charts, graphs and tables.

PREY PREFERENCES OF LOCALIZED BARN OWLS

Original Research

The Barn Owl (Tyto alba) is a member of the family tytonidae of the order Strigiformes. T. alba is one of nine species in the genus but is the only one that is distributed worldwide and the sole representative in North America.. The Barn Owl’s ability to hunt and capture prey in complete darkness allows it to exploit prey species excluded form other predators. Their hunting abilities are functions of its ability to hear soft high-pitched sounds and calculate the distance to the sound in addition to precise direction. T. alba superior hearing plus feather modifications resulting in silent flight, combine to produce an extremely efficient predator. This study determined the prey item preferences of barn owls in Washington County, PA. Microtus pennsylvanicus and Blarina brevicauda composed of over 90% of the barn owls’ diets. It is unclear whether their respective populations or their activity was responsible for the results seen.

PROFESSIONAL PAPERS

Chemical Water Treatment: Industrial, Commercial and Municipal

Original research & Lit Review

A survey of the chemistries required to meet water quality standards set forth for widely variant applications. Drinking water standards and the related physical, chemical and biological treatments were reviewed. The same was completed for Industrial make-up waters as well as effluents. Boiler water and cooling water treatment were also discussed. 126 pages. Charts and tables were reproduced from multiple sources and credited.

Thermal Aeration & Anaerobic Chemical Soil Remediation

Literature Review

A review of several on-site / off site thermal treatments of soils contaminated with volatile organic compounds, semi-volatile organic compounds, chlorinated pesticides, and PCB's. All current technologies were identified and compared using a SWOT (Strengths, Weaknesses, Opportunities & Threats) analysis. Relative acceptance by regulatory agencies and the obstacles to implementing the newer technologies were discussed as was the financial effectiveness of each method. 75 pages. Combination of original and reproduced tables, charts and images. All were given appropriate credit.

Chemical GIS / GPS Applications

Literature Review

An introduction to the application of information technology needed to address environmental, safety, and health (ES&H) information management in an integrated manner. Intuitive and graphical interfaces are emphasized. Potential uses in facilities management systems are discussed as are database management and systems integration. More specifically discussed are approaches for EH&S management systems including hardware and software, as well as its integration with legacy systems and newer systems yet to be even devised. Appropriate GUI applications, database access, logical queries and spatial data modeling and visualization are all discussed.

Great Lakes Chemical Remediation Concerns

Original Research

This effort delineated the Confined Disposal Facilities and 43 other Areas of Concern within the Great Lakes. RCRA and TSCA implications were discussed. Remedial actions taken to date were reviewed with respect to the Federal Water pollution Control Act. Information was compiled from US. Army Corp of Engineers, the US EPA, US Fish and Wildlife Services, The Great Lakes Commission and The US –Canadian - International Joint Commission and all state environmental agencies which border the any of the Great Lakes. 49 pages. Original charts, tables and images..

Chemical Effects of Manufactured Gas Plants in the Midwest

Original Research

A complete review of all the Manufactured Gas Plants in the Upper Midwest. In the late 1800's many communities of all sizes in states such as Ohio, Indiana Illinois Iowa etc. built manufactured gas plants. These facilities made a natural gas like product from coal in order to light gas street lights in these towns and villages. There was a great amount of waste from this process that was laced with the normal carcinogens found in coal and its derivatives. All of these sites and their waste disposal areas were identified. The process and the type of coal used in each case were also determined. This provided the likely composition of the waste. The number of years of production and the amount produced each year helped derive the quantity. However, these volatile and semi-volatile deposits are so old that in a majority of cases there is very little leaching of contaminants. 222 pages. A combination of original and reproduced tables, charts and images.

Basic Computer Networking

Review of current methods

An overview client / server relationships: Operating systems on a server, networked clients and peripherals, interface cards, cabling and interfaced devices such as routers, switches and hubs. Concise Discussion of network configurations, Local Area Networks (LANs) & Wide Area Networks (WANs), Virtual Private Networks (VPNs), and Virtual Local Area Networks (VILANs). The work reviewed networking hardware and configuration considerations.

Review of Differing Sequential Risk Mitigations in Chemical Remediation

Literature Review

The use Sequential Risk Mitigation (SRM) at Superfund Sites and Large RCRA and TSCA Corrective Action Sites, as a substantial cost savings and more rapid risk reduction method, is compared to more conventional methods, as well as to more radical approaches of environmental remedial action. Quantitative examples of all methods and their results are compared. SRM shows promise in that it is a phased approach but it also potentially opens windows for more fragmentation in the total remediation of a hazardous waste remediation site. 59 pages. Combination of original and reproduced charts, table and images.