The Natural History Reserve

Department of Biology, Pittsburg State University, Pittsburg, Kansas

Description

The Natural History Reserve (NHR) is 79 acres (32 ha) of partially reclaimed abandoned mine land. It was originally covered by tallgrass prairie then converted to agriculture prior to the coal mining era. Mining ceased before the regulation requiring restoration and so it was left as a series of parallel spoil banks and over 60 long and narrow strip-mine lakes of various sizes in the depressions beneath them. Four of the pits are large, three bordering the property and one mostly within it. The spoils are heavily wooded with a dense shrub layer.

Natural succession since the late 1930s has resulted in a brushy woodland type of complex in which cottonwood, American elm, Sycamore, Sumac, Poison ivy, Japanese honeysuckle, Amur honeysuckle, and Gray and Redosier dogwood are common. Many of the smaller pits hold water only intermittently. The larger lakes hold water permanently, but are subject to water level fluctuations depending on rainfall.



Fig. 1. Aerial of the Natural History Reserve. (credit: Lynn Pitts)

Of the four buildings in the Reserve, two were constructed in the 1940's prior to PSU acquiring the property – a barn and Quonset hut – two are new - a caretaker's residence and an education/lab building (Figs. 1 and 2). The barn and Quonset hut are used mostly for storage and are both decaying.

An old barn from the 1940's was converted into a classroom and laboratory serving field biology classes in the late 1960's. This building was demolished in late 2005 and replaced in 2006 with

a new building. The new construction retained the four large aquacultural tanks (2 indoor and 2 outdoor). Adjacent to the new lab are large pens for the raptors and a small model prairie called the Sperry Prairie.



Fig. 2. Current configuration of the Reserve. (1 – caretaker's residence, 2 – old barn, 3 – area of raptor cages, 4 – education/lab building, 5 – boat dock and ramp, 6 – Quonset hut, 7 – relic pavilion and new boat dock, 8 – power line.

The caretaker's residence also dated from the 1940's. It slowly became too costly to continue to repair and a new residence was constructed in 2014.

The large main strip-pit lake has a floating dock and is used for field classes. Several fish aquaculture cages used for teaching and research have been used there and are stored at the Quonset hut.

Acquisition

The land was probably mined in the 1920s. Two adjoining tracts, composing the site, now consisting of strip pits and mine spoils, was deeded to the Kansas Forestry, Fish, and Game Commission (precursor of today's Kansas Dept. of Wildlife, Parks, and Tourism) in March 1936. Part of the area was reclaimed as a state CCC project including some leveling of spoil banks and some experimental plantings of woody crop plants.

In April 1949, the property was transferred to the Kansas State Teacher's College of Pittsburg (precursor of today's Pittsburg State University). It was used in this period as a veteran's vocational training center in agriculture. Orchard trees were managed and some livestock was kept in the western side. It was known then as the "College Farm."

The faculty and students of the Biology Department conducted many studies during that time into the 1950s. In the 1960's, the Biology Department began managing the property as a site for research and teaching (Fig. 3).



Fig. 3. An early schematic of the Reserve while it was used an ag farm by the University. From Sperry (1963).

Usage

The Research Reserve has a history of use for research, education, and service. An initial aquatic study was published in 1953 by Charles C. Burner and Claude Leist ("A Limnological Study of the College Farm Strip-Mine Lake." Transactions of the Kansas Academy of Science. 56:78-85). Many theses, most recent ones involving fish culture, have been conducted on the site or using the site (see list below).

Undergraduate students have also been involved in research or service projects at the NHR. In Spring 2004, Jamie Horton established a small prairie plot for the purposes of environmental education. The plot remains today, but has been re-established at least once.

The NHR is also used in undergraduate and graduate education. Upper division and graduate field biology classes use the Reserve for classrelated field work. In "Limnology", the main pit is used for sampling and the lab building as a base for field water quality analysis. In "Terrestrial Field Ecology" vegetated areas have been used for quantitative vegetation surveys. In "Regional Natural History" the sites is used for mammal track and sign collection, bird observation, and plant identification. The NHR is also used by Mammalogy and Ornithology. The site is also used for observations of ecology or raptors in the nonmajor biology course "Environmental Life Science" and the mixed-major "General Biology". Over 400 students access the site each year.

The NHR also houses a set of outdoor cages for raptors used in the Department's environmental education program, Nature Reach. Biology majors also gain experience (course work or volunteer) in bird husbandry.

Many construction and service projects have occurred at the Reserve, mostly involving infrastructure for the raptor program. Students in the "Principles of Conservation" class have performed service projects for the site. Outside parties have also contributed to the NHR. Donations of money or in-kind contributions have been received from the Sperry-Galligar Audubon Society, including \$2,300 to help construction of a new raptor/lab building. Westar Energy, through its Green Team program, has donated materials and labor to construct cages for non-releasable birds. During the summer, nature camps have been held for grade-school age children under the auspices of Nature Reach. A teaching garden was developed adjacent to the caretaker home to be used as a part of the camps. In addition, a picnic/teaching area was established to the south of the education/lab building.

Management

The University provides much of the maintenance needed at the site. The primary management is mowing along the road and open areas near the buildings and road as well as some access trails. In 2011, Westar Energy cut a swath of trees down to protect the power line onto the site.

Other activities include annual mowing or burning of Sperry Prairie, herbicide application to control Johnson grass and *Sericea lespedeza*, and annual maintenance of brush near the dock and other aquatic areas

Biodiversity

There are a series of 1960's vintage inventories that have mostly not been updated (Arruda 2011). The bird list was revised in 1989-1995 by Chris Pistole and there is modern list of terrestrial gastropods. Amphibians, reptiles, mammals and plants have not been revisited.



Theses

2003. Training White Crappie (*Pomoxis annularis*) to a Commercial Pellet Using Ground Gizzard Shad (*Dorosoma cepedianum*). Spencer, Amy D. (Advisor: Dr. J.R. Triplett) [used NHR to manage fish for use in study]

- 2002*. Compensatory Feeding and Culture of Black Crappie (*Pomoxis nigromaculatus*) in a Recirculating System. Doolin III, James P. (Advisor: Dr. J.R. Triplett)
- 1995*. Culture of White Crappie (*Pomoxis* annularis) in a Recirculating System. Thomas, George L. (Advisor: Dr. J.R. Triplett)
- 1994. Cage Culture of Black, White, and F1 Hybrid Crappie (*Pomoxis* Species). Read, D.V.M., Emily R. (Advisor: Dr. J.R. Triplett)
- 1992. Comparisons of Three Feeding Techniques in the Cage Culture of *Ictalurus punctatus*. Bussone, Jim J. (Advisor: Dr. J.R. Triplett)
- 1991*. Trainability, Growth, and Conversion Efficiency of White Crappie *Pomoxis annularis* on an Artificial Diet. Amspacker, Troy D. (Advisor: Dr. J.R. Triplett)
- 1978. The Mammals of the PSU Natural History Research Reserve. Foutchi, Hossein. (Advisor: Dr. Horace Hays)
- 1977. The Growth Rate of Certain Fishes in a Strip-mine Lake. Renegar, Steven J. (Advisor: Dr. J. Carl Bass)
- 1977. An Ecological Study of the Cottontail Rabbit (*Sylvilagus floridanus*) at the PSU Natural Research Reserve. Racy, Jeffrey L. (Advisor: Dr. Horace Hays)
- 1977. The Diatom Flora of Two Strip-mine Lakes on the PSU Natural History Reserve. Frank, Jann P. (Advisor: Dr. Eugene Fairchild)
- 1972. Growth-Rate Analysis of Members of a Centrarchid Community in a Strip-mine Lake. Meyer, Robert E. (Advisor: Dr. J. Carl Bass)
- 1972. A Taxonomic Study of the Yeasts Isolated from Orchard Soil on the Natural History Research Reserve of Kansas State College of Pittsburg. Byler, Donna I. (Advisor: Dr. Bettie Duncan)
- 1971. Age and Growth of Three Species of Centrachids from a Natural History Research Reserve Strip-mine Lake and Comparison with Growth Rates Attained in Similar Lakes. Reed, Mildred A. (Advisor: Dr. J. Carl Bass)
- 1970. An Analysis of the Age and Growth Rates of A *Lepomis cyanellus* Population Taken from a Strip-mine Lake in Southeast Kansas. Rudella, John D. (Advisor: Dr. J. Carl Bass)
- 1970. Age and Growth of a Population of Bluegill. Coffey, Roger L. (Advisor: Dr. J. Carl Bass)
- 1968. The Osteogenesis of the Pectoral Spine of the Channel Catfish *Ictalurus punctatus* (Rafinesque). Triplett, James Robert. (Advisor: Dr. J. Carl Bass)

- 1967. A Growth Comparison of the Bluegill Lepomis macrochirus in a Pennsylvania and a Kansas Strip-mine Lake. Wessner, John. (Advisor: Dr. J. Carl Bass)
- 1965. Some Aspects of the Ecology of Small Rodents in a Strip-mine Habitat. Heacock, Kenneth L. (Advisor: Dr. Horace Hays)
- 1965. Comparison of Growth Rate of *Pomixis* annularis in Two Strip Pits in Crawford County Kansas. Alexander, Ronald R. (Advisor: Dr. J. Carl Bass)
- 1951. Fish Production in Strip-mine Lakes of Southeastern Kansas: II. A Preliminary Limnological Study of the College Farm Strip-mine Lake. Burner, Charles G. (Advisor: Dr. C. Leist)

Publications

- 1992. Ford, Steven. PSU Natural History Reserve. pp. 9-12 *in*: J. Arruda (ed), Kansas Academy of Science Multidisciplinary Guidebook 6. Fall Field Trip to the Natural Areas of Southeast Kansas. Kansas Geological Survey Open-File Report 92-22. 91 pp.
- 1983. Briggs, John M., Jeffrey L. Racey, and Horace A. Hays. A five-year study (1975-1979) of the home range of the Cottontail Rabbit [*Sylvilagus floridanus alacer* (Bangs)] on stripmined land in southeast Kansas. Transactions of the Kansas Academy of Science. 86(1):24-30.
- 1963. Sperry, Theodore M. The Natural History Research Reserve of the Kansas State College of Pittsburg. Transactions of the Kansas Academy of Science. 66(1):76-81.
- 1954. Maupin, James K., James R. Wells, Jr., and Claude Leist. A preliminary survey of the food

habits of the fish and physico-chemical conditions of the water of three strip-mine lakes. Transactions of the Kansas Academy of Science. 57(2):164-171.

- 1953. Burner, Charles C. and Claude Leist. A limnological study of the college farm stripmine lake. Transactions of the Kansas Academy of Science. 56(1):78-85.
- 1953. Wells, James R. The reclamation of stripmined areas in southeastern Kansas. Transactions of the Kansas Academy of Science. 56(3):296-292.
- 1952*. Burner, Charles C. and Claude Leist. Studies in strip-mine lake improvement. Kansas Forestry, Fish, and Game Commission, Bull. 9:2-4.
- 1951*. Rogers, Nelson F. Strip-mined lands of the Western Interior Coal Province. Research Bulletin 475, Agr. Exp. Stud., Univ. of Mo., Columbia, Mo.
- 1949*. Rogers, Nelson F. The growth and development of Black Walnut (*Juglans nigra* L.) on coal strip-mined land in southeast Kansas. Transactions of the Kansas Academy of Science. 52:99-104.
- * thesis or publication related the theme of the field sites, but did not use the site

Departmental Documents

2016. Arruda, J. Biodiversity of the Natural History Reservations. Southeast Kansas Biological Station. Department of Biology, Pittsburg State University, Pittsburg, Kansas. pp 7.



Image by Horace Hays (1958), probably the north end of the main strip-pit lake



Source unknown, ca 1960s, view looking east-northeast



Source unknown, ca 1960s, view looking south-southwest



Source unknown, ca 1960s, view looking east-northeast



Demolition of the old lab building (October-November 2006).



Walls of new education/lab building made with "ecoblocks" (November 2006).



Completed education/lab building (summer 2007).



View across main strip-pit lake toward education/lab building and barn (spring 2007).



Finishing stages of the caretaker's residence (February 2014)



View across main strip-pit lake toward new residence (February 2014).



The dock at the main pit (November 2014).



A view looking south down the main pit (November 2014).