HIGH SCHOOL FIELD ECOLOGY: THE ECOSYSTEMS APPROACH

Most educators believe that learning is best accomplished by first-hand experience, and "take them where it's at" is a philosophy that environmental educators in Wichita's District 259 have shared for some time. Field ecology has been taught in Wichita schools every summer since 1971 and during the spring semester since 1972. The spring course, taught on Saturdays, is worth one-half unit of lab science credit, and the summer course, lasting for seven weeks from early June to late July, is worth one unit of lab science credit. The summer course can be taken to fulfill the science requirement for high school graduation. Students in grades 9-12 may enroll, and there are no prerequisites. Enrollees pay the normal summer school fee, approximately $40.

The spring sessions are taught at two high schools, with total enrollments averaging close to 50. Summer sessions meet at three learning centers, and total enrollments range between 70 and 85 students. Because the basic philosophy of the course is that ecology is best taught in the field, this is where the students are "at" four days out of five. Official class meeting time is 8:00 A.M. to 12:00 P.M. daily, but many field experiences start at 5:00 A.M. and last until 6:00 P.M.

Field excursions extend from the Little Sahara Desert and Salt Plains in northwestern Oklahoma to the oak-hickory deciduous forest of southeastern Kansas. Emphasis is placed on the ecological similarities and differences of the major terrestrial ecosystems in and around Kansas—desert, short-grass prairie, midgrass prairie, tall-grass prairie, and deciduous forests. Ponds, lakes, rivers, streams, and freshwater and saltwater marshes are also studied on site.

Grassland preserves are studied at Fort Hays State College, Sand Prairie Natural History Preserve, and Ross Natural History Reservation. The deciduous forests of Kansas are primarily riparian. The cottonwood-willow-elm ecosystem is studied along the banks of the Arkansas River. Oak-hickory forest studies are made along the Fall River near Toronto Reservoir.

Cheney and Santa Fe Lakes, near Wichita, provide a variety of experiences, including collecting fossils for studies in paleoecology. The bus stops often at roadcuts for rich fossil finds and brief discussions of the shallow sea and swamp ecosystems of the past.

The importance of man's role in the environment is illustrated in excursions to refineries, cattle feed lots, soil conservation projects, rangeland management areas, sanitary land fills, open dumps, gas and coal powered electric plants, water plants, and sewage plants. Through this exposure students are given the opportunity to hear the side of the story from those most often accused of degrading the environment. We have found that municipalities, industries, utilities, and agriculturalists welcome visits and questions.

The lack of prerequisites produces a heterogeneous group of youngsters. The range of abilities, interests, and motives is broad. There have been cases of students who have failed biology or its equivalent as many as three times enrolling out of desperation to fulfill the science requirement. On the other hand, regional science fair winners with high ability and high motivation have enrolled because of a deep interest in and concern for the environment.

With this diversity, the method of teaching becomes a problem. For the majority of the students the taxonomic approach is too difficult, too irrelevant, or just too boring. The ecological approach is more exciting, but for many of the students the instrumentation and much of the data analysis is too sophisticated.

The reflective method developed by the Association of Classroom Teachers and the National Park Service (the "Strand Approach to Environmental Education") uses five broad, universal concepts to guide the student into an exciting inquiry into his surroundings. The "strands"—variety and similarities, patterns, interaction and interdependence, continuity and change, and evolution and adaptation—quickly develop the observational skills and reflective qualities necessary to obtain a "feel" for the environment.

We have found that the strand method isolated by itself is not as effective as a "trihybrid" of the three methods. As soon as students "discover" the varieties and similarities of plants and animals, they want to know their names, so enters taxonomy. In reflecting on interaction and interdependence of organisms with each other and with their physical environment, students develop a desire to collect more data and make sophisticated analyses of this data. This "trihybrid" often "blooms" into a project, a fourth method.

Long field trips often find the classes from the three learning centers traveling together. The road often becomes long and hot, the seat becomes hard, but the experiences of social interaction nearly equal the ecological experiences. Black and white, rich and poor, bright and not so bright develop a bond of positive social interaction and cooperation.

The criteria for grading are left to the individual teacher, but grades are generally based on attendance, participation, enthusiasm, quality of projects, and, usually, an essay exam comparing two or more ecosystems.

The idea of studying ecosystems "where they're at" started as a one summer experiment. The cost for materials and particularly transportation has been high, but the tremendous interest and enthusiasm displayed by students has for several springs and summers justified the expense.

George D. Potts
Wichita North High School
1437 Rochester St.
Wichita, Kan. 67203

Merle Gates
Wichita West High School
820 S. Osage St.
Wichita, Kan. 67213

H. O. Sanderson
Wichita South High School
701 W. 33rd S.W. St.
Wichita, Kan. 67217