

Sediment generally was not present in small streams more than 2 miles from the mine area. But of 14,000 miles of stream channels affected by surface mining, half have had their water-carrying capacity reduced; along 4,500 miles capacity was moderately reduced, and along 2,500 miles capacity had been affected only slightly.

Self-contained mining sites—quarries, dredged areas, and some area-stripped sites—do not have enough runoff to warrant costly storm-water controls. Contour-stripped areas can be used to manage runoff in much the same way as broad-based terraces. But on 98 percent of the surface-mined land studied in Appalachia—where most contour stripping is done—storm-water runoff control was not adequate to prevent erosion, sediment, or flooding.

On these areas, vegetative and mechanical measures or a combination are needed. An example is the need for grading within some surface-mine pits to control storm runoff. About 75 percent of the sites need some grading, and only 45 percent have received any. Grading too much or on the wrong soil material, though, may make matters worse; special care and technical assistance are needed. In some areas of the West, minor reshaping of some banks is adding to the beauty of the landscape.

Ponds

Many surface-mined areas have ponds or depressions, especially where area stripping has been done. Forty-two percent of the ponds are smaller than an acre, 40 percent or 1 to 10 acres, and 18 percent are larger than 10 acres. Two-thirds are more than 5 feet deep.

Acidity is a problem in some ponds—one-fifth of those studied had a pH rating of less than 4.5. The other four-fifths are less acid and include the larger and deeper ponds that have greater potential use. Some are being used even for municipal water supplies.

Animal life was present in four-fifths of the ponds, but scarce in the acid ponds.

Effect on wildlife

Disturbing land and water for mining naturally disrupts wildlife habitat. State fish and game commissions reported to U.S. Bureau of Sport Fisheries and Wildlife that nearly 2 million acres of wildlife habitat had been damaged by surface mining—68 percent of it east of the Mississippi River. Most damage resulted from:

- Stream widening, affecting water temperature and depth of spawning beds.
- Lake draining.
- Burying or removing spawning gravels.
- Diverting surface flow.
- Sediment.
- Chemical changes in soil and water quality.
- Removing food, nesting, and escape cover plants.
- Forming high walls that limit animal access or movement (a problem on about one-fourth of the high wall mileage studied).

Where proper restoration measures have been taken, fish and wildlife habitat has improved and often is better than before mining. Since the same kinds of wildlife use the mined site and adjacent lands, there is opportunity for managing both areas together for wildlife habitat on private and public property.

Safety

One-third of the mined areas studied had some safety hazard, usually water. On 22 percent of the inactive areas there was evidence of abandoned buildings, equipment, debris, or rubble—some hazardous and nearly all unsightly. Ten percent had one or more deep-mine openings—without shaft sealing. Restoration measures, well planned and carried out, reduce the danger to public safety.

ACCOMPLISHMENTS

USDA's participation in surface-mined-land conservation began in the 1930's. The Forest Service then began research on revegetating mined land and keeping acid and sediment out of streams. The Soil Conservation Service at the same time began helping landowners improve their soil and water resources and solve many land use and land treatment problems, among them surface mining.

During one 5-year period, 1960-64, more than 5,000 land owners and operators in 500 local soil and water conservation districts in 31 States applied conservation measures to nearly 128,000 acres of surface-mined land with USDA help (table