I. Know Your Federal Agencies

DOI ~ Department of the Interior, executive department of the United States government that serves as the nation's principal conservation agency. Established by the Congress of the United States in 1849, the department is headed by a secretary appointed by the president with the approval of the Senate. The department's responsibilities include protecting and conserving the country's land, water, minerals, fish, and wildlife; maintaining national parks and recreation areas; and preserving historic places. It also provides for the welfare of Native American reservation communities.

In 1988 the department managed more than 220 million hectares (550 million acres) of federal resource lands; about 340 units of the national park system; 70 fish hatcheries and 442 wildlife refuges; and numerous reclamation dams. The Department of the Interior comprises numerous federal agencies, including the Bureau of Indian Affairs, the United States Fish and Wildlife Service, the National Park Service, and the Geological Survey.

In the United States, extensive reclamation projects began with the enactment in 1902 of the Reclamation Act, which was established to stimulate the economic development of 16 sparsely populated western states. Since then, the Reclamation Service, now called the Bureau of Reclamation, has supervised many federal projects that supply water and power for use in agricultural irrigation, industry, flood control, preservation of fish and wildlife, domestic needs, and recreation.

Reclamation of coastal areas is also possible where offshore or tidal marshlands are covered by shallow water. Many countries have reclaimed land by construction of ditches and drainage of land between dikes and the natural coastline. More recently, many states have enacted legislation requiring mining companies to restore and re-vegetate strip-mined land after a mining operation is abandoned.

Reclamation projects can have harmful effects on the environment. For example, the application of fertilizers and other chemicals on irrigated land increases the salt content of the soil and of the water returning to the source of irrigation, such as a river.

BIA ~ Bureau of Indian Affairs, agency of the United States government, generally responsible for administering federal policy for Native Americans and Inuits (Eskimos). One of the oldest federal agencies, the bureau was created in 1824. Headed by an assistant secretary, the bureau's headquarters is in Washington, D.C., but most of its employees and resources are scattered among offices on Indian reservations. Most of the bureau's employees are Native Americans.

The Bureau of Indian Affairs provides schools on large reservations where public schools are inaccessible. It also sponsors vocational training and employment programs for adults. The bureau offers technical advice and service to tribal governments on administrative procedures, construction, and economic development projects. It maintains a loan fund to assist individual and tribal businesses. The bureau also oversees the preservation and use of land and other natural resources that are held in trust for tribes by the federal government.

NPS ~ National Park Service, bureau of the United States Department of the Interior, is responsible for conserving natural scenery, wildlife, and historic sites and objects, and providing for public enjoyment of these areas. The National Park Service was established in 1916 by the Congress of the United States. The areas managed by the service are known collectively as the National Park System. The service is headed by a director, who is appointed by the Secretary of the Interior. The park system is administered through ten regional offices. Each parkland area is directed by a superintendant, who oversees the selection and training of staff, organizes recreational programs, and plans conservation activities.

The National Park Service includes more than 350 areas covering about 324,000 sq km (about 125,000 sq mi). The service administers more than twenty types of areas, which can be grouped into four broad categories: natural, historical, cultural, and recreational. Additions to the park system are generally made by acts of Congress. The president of the United States can also make additions. In 1872 Congress established Yellowstone National Park as a public park. Yellowstone was the world's first national park and set a precedent for the preservation of scenic federal lands.

BLM ~ Public Lands, in United States law, term designating largely vacant and unappropriated lands administered by the Bureau of Land Management (BLM) of the United States Department of the Interior. The United States has approximately 110 million hectares (272 million acres) of public land, exclusive of its national parks, national forests, national wildlife refuges, and other land set aside for particular uses. BLM-administered lands are located primarily in the western United States and Alaska.

Three parts to get you started.

II. Acquisition and Disposal of the Public Domain

Following the American Revolution (1775-1783), certain states ceded their claims to lands west of the Allegheny Mountains to the federal government. The government later acquired additional land through the Louisiana Purchase (1803) and other purchases.

The first significant legislation pertaining to the disposal and use of public land came in 1776, when the Continental Congress offered land grants to induce soldiers to desert from the British army. In the early years of the American republic, many national leaders saw public land as a source of government revenue, and public policy was directed toward the sale of land; however, the policy of selling public land was never highly successful.

Grants of public lands were awarded by the Congress of the United States to encourage the construction of canals, wagon roads, and railroads. Other grants were made to colleges to promote the teaching of agriculture and the mechanical arts (see Land-Grant Colleges). Beginning with the creation of Yellowstone National Park in 1872, many national parks, forests, and wildlife refuges were carved from the public domain.

A general change in the policy of public land disposal came with the passage of the Homestead Act in 1862 (see Homestead Laws). By 1932 more than one million settlers were drawn to public land in search of farms, and by 1962 all agricultural land had passed from public ownership.

III. Rules for Administering the Public Lands

In 1812 Congress established the General Land Office within the Treasury Department to oversee public-land disposal. This office was transferred to the newly created Department of the Interior in 1849. In 1934 Congress passed the Taylor Grazing Act to provide for the leasing of public land for livestock grazing and established the Grazing Service within the Department of the Interior to administer the act. The Grazing Service was combined with the General Land Office to form the Bureau of Land Management (BLM) in 1946. The BLM is responsible for the balanced management of public lands and resources and their various values to best serve the needs of the American people.

INSECTS

antlions

The presence of an antlion is identified by a funnel shaped hole in the sand. The larvae rest at the tip of the funnel. Any wandering insect that slides into the funnel will activate a hair trigger between the antlion's jaw which will shut with force to impale the wanderer.

cicadas

Known best by the high-pitched continuous call of the mating male. Nymphs spend life, several years, underground; the tunnels access plant roots. In the year they become adult, there is a hover period subsurface, a soft adult within an exoskeleton. The emergence from the soil is near sunset. The exoskeleton is shed and left behind on whatever the insect climbs upon. The adult wings are flexed to dry to allow the cicada to fly by midnight as it is a delectable treat for predators.

daddy longlegs

The interesting fact about this arthropod is the slender legs will break off much like a lizard's tail when it is necessary to escape. Daddy longlegs' mouth parts are not fanged like spiders, but like scorpions with chewing mouth parts. The scientific name Opilio means shepherd because the legs are likened to the stilts shepherds used to get aloft to count their sheep.

shrimp

Fairy shrimp and tadpole shrimp feed on microorganisms in the mud. The life cycle is completed in a few weeks about the time the water source dries up. The eggs endure the heat and are perhaps spread from the mud on the feet of birds. Tadpole shrimp resemble trilobites. Fairy shrimp are almost transparent, swim upside down, and the males have a large additional antennae to clasp the female to mate.

creosote woolly gall

This bright reddish brown intrusion looks like a parasitic plant growth not an accumulation of an insect. A tiny fly deposits an egg in a terminal bud, which hatches a red grub. The plant grows the gall around this feeding grub. By residing in the creosote the grub is protected from disturbance by herbivores because the creosote produces defensive chemicals to divert chomping.

ARCHES - In 1929 an area of 270,000 acres were set aside for a National Monument. By 1971, 73,000 acres, much of the Maze, were added and preserved as park land. Walt Dabney added more acres in 1999.

CANYONLANDS - In 1964, 338,000 acres were delineated into three regions: Needles, Island -in-the-Sky and Maze districts. Early Native Americans knew the Maze as "Land of Standing Rocks" or *Toom-pin wu-near' tu-weap*.

NATURAL BRIDGES National Monument - 7,800 acres to protect three sandstone bridges in 1908 . Sipapu, Kachina and Owachomo span 180 feet to 268 feet at heights of 106 to 220 feet above streambeds.

La Sal Mountains - La Sal means salt in Spanish. The Spaniards Dominguez and Escalante named it during their 1776 travels through these lands. Hayden would map the range a hundred years later, labeling the range La Sal, although it had also been referred to as the Elk Mountains. The Miner's Basin attracted hopefuls in the 1800s, enough to set up a general store, saloons, two restaurants, and a livery stable. Aside from this 10,000 people were a few hundred single men in the Bachelor Basin. These several communities were connected by what is now known as the Trans La Sal Trail. Presently, timber, livestock and recreation sweep users onto the land. Taylor Flats was named for *Times Independent* Sam Taylor's family back when they ran cattle up in there. His son Zane rafted commercially for a Moab outfitter before he began to join his father at the press.

Mt. Peale - San Juan County's highest peak at 12, 721 feet. An account says it is named for its reverberations and peals when the thunderstorms. The Hayden Survey of 1875 lead by Henry Gannett and James L. Gardner also had a mineralogists named Albert Peale along. This group of individuals mapped much of this region.

Mt. Waas - Grand County's highest peak at 12,331 feet. The Hayden group had a Native American guide for whom Waas and Mt. Tomasaki was named. (Tomasaki is located in the central range of the La Sals). Mount Tukuhnikavats is Paiute for "where the sun sets last". Mount Mellinthin comes from a Moab forest ranger, Rudolph E. Mellinthin who died on August 23, 1918 by the gunshot of a draft deserter he was apprehending.

Scott, David L. and Kay W., National Park Areas Western States, The Globe Pequot Press, Chester Connecticut, 1992.

Van Cott, John W., Utah Place Names, University of Utah Press, SLC, UT, 1991.

Huff, Paula and Wharton, Tom, Hiking Utah's Summits, Falcon Publishing Company, Inc, Helena and Billings Montana, 1997.

Reader's Digest, Our National Parks, Reader's Diegest Association, USA, 1985.

Riparian Ecology

Richard Valdez taught a zesty five day condensed edition of riparian ecology. I had to secure permission to reprint the suggested reading list from Valdez course after writing 'Elements of Leadership' in Volume 5 Issue 3 about the richness of subjects also to be found in the bibliography. I've determined Valdez is an assured teacher and surmise these readings will be pertinent to those of us perpetuating our study of the Colorado Plateau.

For the first time I heard that the Colorado Squaw fish had a name change in the past year. Native Americans expressed concern about the utilization of "squaw." So listen up when someone mentions the Colorado Pike Minnow. You do know the fish.

The coolest element about this course was relating to Dr. Valdez's illustrations about water levels in the course of the last decade. I don't run into many who have remained around the river that long and have had similar observations about the phenomenon of hundred year floods, dam restitution, relationship of non-native growth and the entrenched meander. The terminology sustained me. I'm in the habit of basic-sizing concepts for laymen, children, foreign speaking entities, and entry level guides that terminology is oft foregone. Let me share with you some of my favorite riparian ecology vocabulary.

Aquatic lives are growing or living in or on the water. Xeric pertains, not only to a terrestrial zone, but, specifically, dry lands. In between these areas is a habitat that is moderately moist, the mesic region, which is often the riparian.

In Grand County, land was purchased to set aside a unique and vital edge of the river, the riparian known as the Matheson Wetlands, managed by The Nature Conservancy. Federal regulation, section 404 of the Clean Water Act, specifies that the Army Corps of Engineers is responsible for issuing permits to discharge dredge or fill material into the United States waters, including wetlands. Allochthonous organic matter enrich wetlands when spring run-off rises over the banks, sweeping up debris upstream and redistributing it. This is an instance of the ecology of a lotic (fluvial/flowing) system. On another perspective, lentic (adfluvial/lake) systems, autochthonous organic matter grows from within, like the growth of algae. Photosynthesis must be able to penetrate the water to spur growth.

Where the river is shallow or thin enough for light to penetrate for photosynthetic production and the nutrients are present, it is possible for a flowing water way to also be autochthonous.

A person can't study riparian ecology without considering geomorphology: how an area is shaped by the surrounding geology. Wetlands are a result of geomorphology and give way to a dense and diverse biomass. The razorback sucker reproduction is affected by changes of the historic reckoning of flows into wetlands. Other species have adapted to the narrow canyons that tumble columnar collapse creating a debris flow. This action feeds particles into the river. The grains bear an incipient motion, sulsatating downstream into suspension. The thalwag is the current of velocity and how the energy is

channeled. Where a constriction exists from the peeling of canyon walls into the river, ponding will occur.

Humpback chub

The thalwag is the flow through the constriction into the expansion zone. Here there is a recurrent channel, it runs between shore and a forming sandbar, accelerating towards the upstream end creating a backwater, nursery to many fish. Scour channels are located at the end of sandbars, that deep edge downstream. Chute channels can be thought of as the highwater route, it is often abandoned. Another nursery area is flooded bottomland.

Neat facts about fish:
The razorback hump is a fusion of three bones; humpback chub has a hump of fat and muscle.

Cutthroat trout are native species to the Colorado River. They have pharyngeal teeth. These teeth pull food into the gut like a hinged claw action, they are also binge feeders.
Bonytail has the least known about it and most endangered in North America. In the 1950s - 60s, sportsmen were catching them. Signs of decrease predate the Flaming Gorge Dam, perhaps they were more susceptible to the predication of non-native species and suffer biological extinction. There are so few that they can not find each other. There are now 70 species in the main stem of the Colorado River, 34 of them are predators, when there originally was only one predator, the Colorado Pike Minnow. Life strategies, phonology, of fish are responsible for the unusual adaptations seen in the native species. Some species rely on rheophylic communities, the life that occupies the interstitial voids in a stream system, as in, cobbles. Sand bottoms are ordinarily sterile and life depends on other islands of productivity from the dragging overhanging plants along the shore to alluvial fans blowing in substrate to backwater conditions and flood bottoms.

SUGGESTED READING:

Valdez recommneds the following reading:

American Fisheries Society. 1980. Position paper on management and protection of western riparian stream ecosystems. American Fisheries Society, Western Division. 24 pp.

Armour, C.D. Duff and W. Elmore. 1994. The effects of livestock grazing on western riparian and stream ecosystems. Fisheries 19:9-12.

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Crispin, V., R. House, and D. Roberts. 1993. Changes in instream habitat, large woody debris, and salmon habitat after the restructuring of a coastal Oregon stream. North American Journal of Fisheries Management 13:96-102.

Hawkins, C.P., M.L. Murphy, N.H. Anderson, and M.A. Wilzbach. 1983. Density of fish and salamanders in relation to riparian canopy and physical habitat in streams of the northwestern United States. Canadian Journal of Fisheries and Aquatic Science 40:1173-1185.

Jensen, S. and W.S. Platts. 1987. Processes influencing riparian ecosystems. Pages 228-232 In: Mutz, K.M. and L.C. Lee (tech. coord.) Wetland and riparian ecosystems of the American West. Proceedings of the Eighth Annual Meeting of the Society of Wetland Scientists, May 26-29, 1987, Seattle, WA.

Kauffman, J.B., R.L. Beschta, N. Otting, and D. Lytjen. 1997. An ecological perspective of riparian and stream restoration in the western United States. Fisheries 22:12-24.

Kennett, R. and 0. Tory. 1996. Diet of two freshwater turtles, *Chelodina rugosa and Elseya dentata* (Testudines: Chelidae) from the wet-dry tropics of northern Australia. Copeia 1996:409-419.
Meehan, W.R. (editor). 1991. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19, Bethesda, Maryland. 751 pp.

Owen, O.S., D.D. Chiras, and J.P. Reganold. 1998. Natural resource conservation management for a sustainable future. Prentice Hall, Upper Saddle River, New Jersey. 594 pp.

Padgett, W.G., A.P. Youngblood, and A. H. Winward. 1989. Riparian community type classification of Utah and southeastern Idaho. USDA Forest Service Intermountain Region Publication R4ECOL-89-01, Ogden, UT. 191 pp.

Reisner, M. 1986. Cadillac Desert: the American west and its disappearing water. Penquin Books, New York. 582 pp.

Roper, B.B., J.J. Dose, and J.E. Williams. 1997. Stream restoration: is fisheries biology enough? Fisheries 22:6-1 1.

Rules and Regulations Regarding Rock, Mineral, and Fossil Collecting in Utah

by Geologic Service Staff Utah Geological Survey, revised April 1996

Utah's rock, mineral and fossil collectors must adhere to rules and regulations established by owners of the lands on which they wish to collect. Prior to collecting, rockhounds should determine ownership of the lands they intend to visit and familiarize them selves with the regulations that apply to collecting on those lands. Site-specific land-ownership maps may be consulted at the recorders office in the county in which you intend to collect. Utah's lands are managed by the federal government (Bureau of Land Management, U.S. Forest Service, National Park Service, or the Bureau of Indians Affairs), state government (School and Institutional Trust Lands Administration), and private owners (including local governments). Rockhounding permits are required to collect on some government lands, and permission is required to collect on private lands.

FEDERAL LANDS

About 67 percent of Utah's lands are managed by the federal government. Most of this land is open to collection except for National Parks, National Monuments, Indian Reservation, military reservation, dam sites, wildlife refuges, and wilderness areas.

Bureau of Land Management (BLM) Lands: The casual collector may take small amounts of petrified wood, invertebrate and plant fossils, gemstones, and rocks from unrestricted federal lands in Utah without obtaining a special permit if collection is for personal use, non-commercial purposes. Collection in large quantities or for commercial purposes requires a permit, lease, or license from the BLM.

Collectors of petrified wood on BLM land are subject to slightly different rules. Collecting for personal use has a maximum limit of 25 pounds plus one piece per day but cannot exceed more than 250 pounds per calendar year. Use of explosives and/or power equipment is forbidden. Collectors wishing to resell their petrified wood specimens must apply for a permit.

National Parks and Native American Lands: Collecting on these lands is prohibited.

U.S. Forest Service Lands: Rock, mineral, and fossil collecting on lands managed by the U.S. Forest Service requires a permit. Although collecting is allowed in most districts and permits are free, collecting rules vary among districts. Seek the rules to avoid penalties.

STATE LANDS

Most state-owned property is managed by the School and Institutional Trust Lands Administration (Trust Lands) and a Rockhounding Permit is required to collect on these lands. A fee is charged for the annual permit. Rockhounds may collect up to 25 pounds plus one piece per person per day, up to a maximum of 250 pounds per year. Collectors cannot operate in state or local parks.

To remove rock, mineral, or fossil specimens from state lands, commercial collectors must also follow specific regulations, and apply for mineral leases. Materials such as building stone, limestone, gemstones and volcanic materials are commonly collected by amateur collectors with permits but require leases for commercial collectors. Obtain permits from: State Lands @ 355 W. North Temple 3 Triad Center Suite 400, Salt Lake City, UT 84180-1204 (801-538-5508).

PRIVATE LANDS

To collect you must have permission from the land owner prior to entering the property.

NOTE: Dinosaur and other vertebrate fossils may not be collected in any instance except by permits issued to accredited institutions. For more information, contact Paleontology and Paleoecology program, Utah Geological Survey, 1594 W. North Temple, Salt Lake City, UT 84114-6100.

SAFETY TIPS

Rockhounding can be a potentially dangerous hobby. To minimize the risk of injury, please remember . . .

- Wear protective clothing (safety glasses, gloves, boots).
- Do not work alone, and let someone else know your schedule.
- Carry a first aid kit.
- Watch for others, and when on slopes, never work directly above or below anyone.
- Do not enter abandoned mines or shafts.