Castilleja

A Publication of the Wyoming Native Plant Society

www.uwyo.edu/wyndd/wnps/wnps_home.htm

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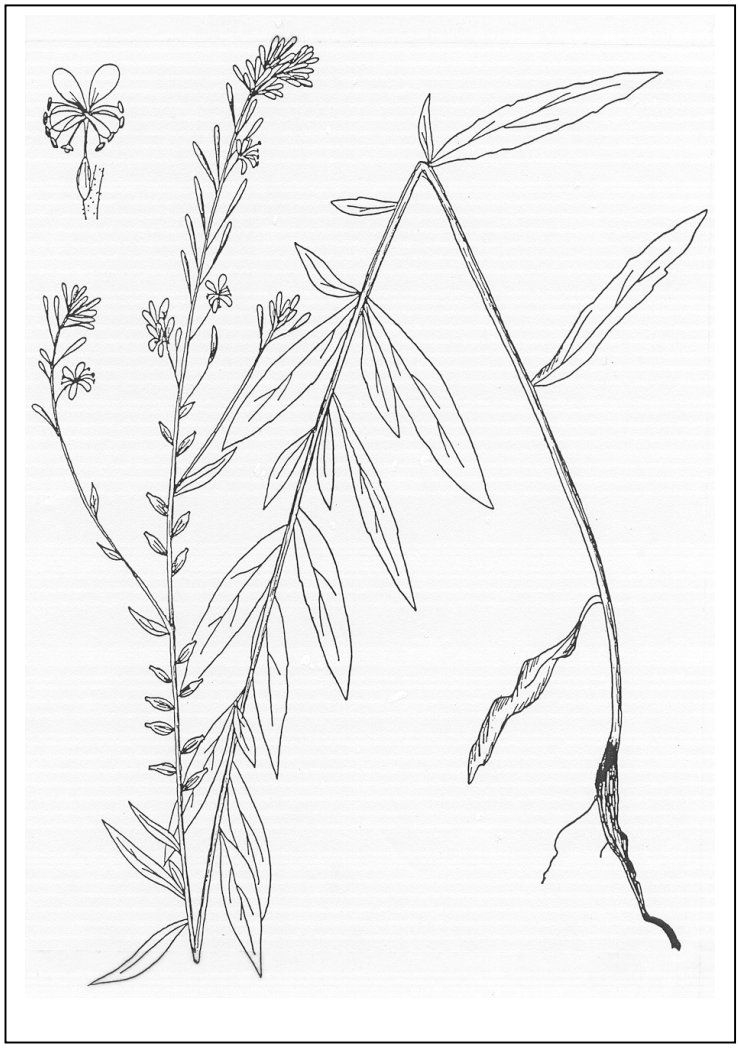
In this issue:

The Colorado Butterfly Plant: Wyoming's Newest Threatened Plant

By Walter Fertig

Nearly a quarter-century after first being proposed for listing, the US Fish and Wildlife Service officially designated the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) as a Threatened Species under the Endangered Species Act on 18 October 2000. Although populations have been fairly stable in recent years and are less imminently threatened than once thought, the Service moved to list this species because of its inadequate protection rangewide. The butterfly plant is only the third Wyoming plant to be listed under the act, joining the Ute ladies tresses (*Spiranthes diluvialis*) and Blowout penstemon (*Penstemon haydenii*).

Gaura neomexicana ssp. *coloradensis* is a short-lived perennial herb with sword-shaped leaves and reddish, hairy, multi-branched stems up to 3 feet tall. It can be recognized as a member of the Evening-primrose family (Onagraceae) by its 4-petaled, long-tubed flowers and inferior ovary. The butterfly plant is moth-pollinated and opens its relatively large (3/8 inch), white flowers in late evening. The flowers remain open until about noon the following day, but turn pink or red as they wither. Only a few flowers along the upper-middle portion of the stem are in bloom at any given time, but the inflorescence can elongate and put forth new blossoms all summer long (at least until the first hard frost of autumn). The flowers produce hard, 4-angled, nut-like fruits throughout the summer and into early fall. Colorado butterfly plant is monocarpic, meaning that it flowers only once during its life and then dies (just like the Century plant of the American southwest).
[Continued on page 4]



Above: Colorado butterfly plant by Walter Fertig

WNPS NEWS

Y2K + 1 Student Scholarship: Thanks to generous contributions by WNPS members, the society's annual student scholarship is available once again for qualified junior college or university undergraduate or graduate students. One to three scholarships will be awarded in the amount of $300-500. Interested students should contact the Secretary of the Society for an application form. Applications are due by 19 February 2001. Winners will be announced by the Board in March.

New and Improved WNPS Web Site: The WNPS web site moved to a new location in late October: www.uwyo.edu/wyndd/wnps/wnps_home.htm. The site has been revamped, thanks largely to the efforts of new volunteer web-master Rebekah Smith of Laramie. The WNPS has information about Society activities, scholarships, membership, past newsletters, history, and a "plant of the month" feature (December's plant is our state flower and WNPS namesake, *Castilleja*). We hope to add more features in the coming months, including an index to past newsletters, selected articles, and county-level plant species lists. The WNPS page is linked to the home page of the Wyoming Natural Diversity Database, which contains information on the state's rare flora and fauna.

New Members: Please welcome the following new members of WNPS: Susan Corey (Sundance), Gary Dean (Kemmerer), Jan Hart (Laramie), Daniel Mathews (Portland, OR), Rebekah Smith (Laramie), Beth Succop (Powell), and Sheila and John Thompson (Worland).

Wyoming Native Plant Society
PO Box 3452, Laramie, WY 82071

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Contributors to this issue: John Baxter, Maggie Byrne, Robert Dorn, Walter Fertig (WF), Debbie McNeil, Isobel Nichols, Jennie Parsons, Edwin Payson, Beth Succop, and Vince Tepedino.

We're looking for new members: Do you know someone who would be interested in joining WNPS? Send their name or encourage them to contact the Society for a complimentary newsletter.

Attention Readers: We are always looking for articles and illustrations for the newsletter. Items for the March issue are needed by 5 March 2001.

Treasurer's Report: Balance as of 8 December 2000: General Fund $661.17; 2000-2001 Student Scholarship Fund $542.50; Total funds: $1203.67. WF

Noteworthy Collections from Wyoming

New Exotic Plants for Wyoming: Robert Dorn reports two new exotic species for the state from his field surveys in Sheridan County in the summer of 2000:

Echinops sphaerocephalus (Globe-thistle): This purple-flowered, perennial member of the sunflower family (Asteraceae) resembles thistles due to its spine-tipped foliage, but differs in having a ball-like inflorescence of numerous, single-flowered heads and a pappus of scales instead of simple or feathery bristles. Globe-thistle is native to Eurasia, but has escaped sporadically in the Pacific Northwest, California, and the eastern United States.

Sorbus aucuparia (Rowan tree or European mountain-ash): This ornamental tree, a native of Europe, is commonly planted across the northern US and occasionally escapes thanks to bird-dispersal of its bright red fruits. Rowan tree can be distinguished from our native mountain-ash, *S. scopulina,* by its more abundant leaflets (typically over 13 per leaf), woolly winter buds, and pubescent inflorescence. WF

Botany Briefs

No Action on Desert yellowhead listing: Citing budget constraints stemming from lawsuits to designate critical habitat for over 300 listed species, the US Fish and Wildlife Service has announced that there will be no new listings of proposed or candidate plant and animal species in the United States during the next fiscal year (1 October 2000-30 September 2001). Among the affected species is Desert yellowhead (*Yermo xanthocephalus*), an endemic of Fremont County known from approximately 10,000 individuals in less than 10 acres of habitat. Desert yellowhead was proposed for Threatened status in October 1998. WF

The Enemy of Native Plants: Noxious Weeds

By Jennie Parsons, Beth Succop, & Maggie Byrne
BLM Cody Field Office, Cody, WY

Noxious weeds are our problem. Noxious weeds are invasive, exotic, alien plant species that spread rapidly and outcompete native plants once introduced into an environment in which they did not evolve. Weeds impact all of our lives: our native plants, our recreational activities, our livestock forage, our wildlife, our water supply, our fish habitat, our forests, our ranches, our agricultural food sources, our soil structure, the temperature of our land, and our gardens. What can be done? It is vital for every individual to recognize our connection to and dependence on the land in almost every facet of our lives. Therefore the attitude that weeds are our problem is the first step to answering the question what can be done.

The threats of weeds are not always apparent, but the effects of weeds are shocking and serious. According to a BLM fact sheet titled "Growing Pains", invasive plants are spreading at a rate of approximately 4,600 acres per day just on federal lands in the western United States. Around 17 million acres of public range lands in the West are infested with weeds. The spotted knapweed in Montana has exploded from a few plants in 1920 to over 5 million acres today. It has been estimated that the annual economic impact of leafy spurge is $129 million on grazing and wild lands in Montana, North and South Dakota, and Wyoming. According to the book *Invasive Plants,* written by the Federal Interagency Committee for the Management of Noxious and Exotic Weeds, the number one work task in the world is hand weeding of crops. Some experts regard non-native species as the second greatest threat to biodiversity after habitat destruction. Weeds are oblivious to state boundaries. It is vital for the public to help prevent, detect, and treat weeds.

The public can take an active role in the battle against the silent, devastating invasion of weeds. Actions can include traveling and camping in weed free areas, pulling and packing out weeds, and becoming educated about weeds. The public can help stop the spread of weeds by planting natives to outcompete weeds; eradicating weeds from the land, removing weed seeds by planting natives to outcompete weeds; eradicating weeds from the land, removing weed seeds that attach to tire treads, shoelaces, and pets; cleaning recreational gear before leaving an area; giving horses certified weed free feed four days before entering the backcountry; and learning to identify local weeds.

The Wyoming Weed and Pest Control Act's designated list of noxious weeds is: Field bindweed, Canada thistle, Leafy spurge, Perennial sow-thistle, Quackgrass, Hoary cress (whitetop), Perennial pepperweed, Ox-eye daisy, Skeletonleaf bursage,

Above: Rabbit's-foot grass (*Polypogon monspeliensis*), an introduced grass species from Europe found sporadically across Wyoming. Illustration from Chase (1950).

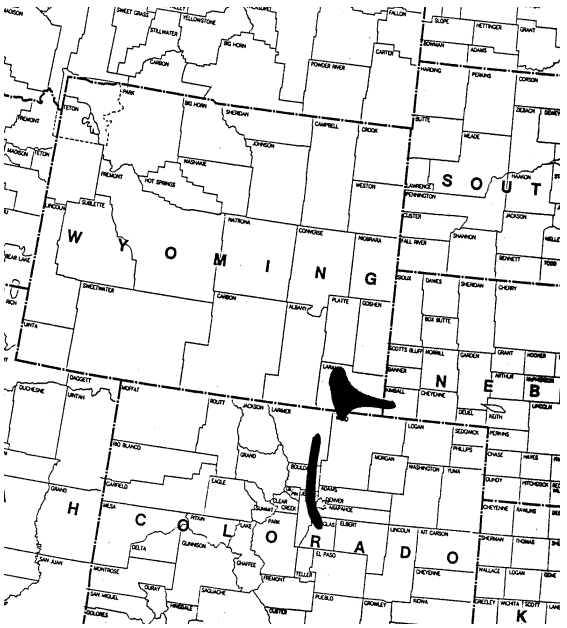
Russian knapweed, Yellow toadflax, Dalmatian toadflax, Scotch thistle, Musk thistle, Common burdock, Plumeless thistle, Dyer's woad, Houndstongue, Spotted knapweed, Diffuse knapweed, Purple loosestrife, and Salt-cedar. County Weed and Pest provides herbicides at a reduced coast to the public (or in some cases for free) to help control the spread of noxious weeds. This agency is responsible for enforcing the laws regarding noxious weeds and also contracts for the spraying of county roads.

The BLM Cody Field Office has hired three Weed Awareness Associates through the Student Conservation Association (SCA) to promote public weed awareness and education over the next year. The Weed Associates had an educational weed exhibit at the Park County Fair and the Cody library this summer. The display has weed identification, weed prevention, and weed impact information. The BLM Weed Associates have educational lesson plans for the 3rd to 5th grade levels as well as for adults. The weed team presented weed identification and impact information to the WYDOT and Northwest Community College. They have been guest instructors in the public school systems this autumn to teach weed awareness. The goal is for teachers to integrate the material into their curriculum year after year. The weed educational program is also appropriate for youth groups such as the 4H and the Scouts. The exercises in the program include such activities as weed population explosion math problems, plant pressing, weed geography, biological control of weeds, informational videos, weed journals, and an artistic weed drawing competition. For more information about presentation programs or weed materials, contact Jennie Parsons, Beth Succop, or Maggie Byrne at 307-578-5900.

The Colorado Butterfly Plant: Wyoming's Newest Threatened Plant [continued from page 1]

Colorado butterfly plant is a wetland species, but has somewhat fussy habitat requirements. It prefers sites with short and sparse vegetative cover in drainage bottoms, low alluvial terraces, and old, abandoned stream channels with a high water table. The plants do not thrive where cover of competing species is high, especially where willows or other brush have become established or where Canada thistle, leafy spurge, or other noxious weeds have become dominant. The butterfly plant is adapted to colonizing areas that are periodically flooded and subjected to grazing.

Despite its common and latin names, Colorado butterfly plant is almost entirely restricted to Wyoming. Of approximately 18 surviving populations, 15 occur in Laramie County, while only two are found in far western Nebraska and one in northeastern Colorado. Apparently this species has never been widespread, despite its ability to colonize disturbed ground or sparsely vegetated riparian areas. As recently as 1976 it was thought to occur at only three sites in the entire world and was proposed for listing as Endangered under the US Endangered Species Act.



Historical distribution of Colorado butterfly plant.

This listing proposal prompted an intensive survey effort in southeastern Wyoming. Robert Dorn discovered the first new population in the state in 1977 south of Cheyenne. Nearly 20 additional sites were discovered or relocated during the next 15 years by Robert and Jane Dorn, Robert Lichvar, Hollis Marriott, Mary Neighbours, and Walter Fertig. Over this time, the total estimated population grew from several hundred to nearly 50,000 reproductive plants (over 200,000 if non-flowering vegetative rosettes are considered).

At the same time, studies were initiated on the butterfly plant's population biology, genetic structure, basic life history, and management needs. Initially, this species was thought to be quite vulnerable to grazing, herbicides, mowing, competition from weeds, and loss of habitat to urban expansion. Follow-up studies have found that several of these threats are less significant than initially feared. For example, Colorado butterfly plant can respond favorably to winter grazing, low density grazing, or short-rotational grazing cycles, which remove competing cover that can restrict seedling establishment and growth. Although edible (and readily browsed by cattle, horses, deer, antelope, and rodents), the butterfly plant is able to compensate for loss of leaves and stems by producing additional branches and inflorescences. Mowing has also been found to be a less serious threat, provided cutting is done late enough in the growing season so that the plant's fruits have ripened (mowing may even serve as a dispersal mechanism). Other threats remain important however, especially loss of habitat to development, mortality from herbicides, and competition from other plant species in the absence of periodic disturbances.

One of the largest known populations of Colorado butterfly plant occurs along Crow and Diamond creeks (and an unnamed tributary) on F.E. Warren Air Force Base, just outside of Cheyenne. Annual monitoring studies on the Base since the mid 1980s have documented an overall increase in plant numbers, although annual fluctuations are common. The Air Force has set aside part of the plant's habitat as a natural area for the preservation of the butterfly plant and other riparian plants and animals and is initiating an experimental weed removal program to enhance the plant's habitat.

Being listed under the Endangered Species Act affords *Gaura neomexicana* var. *coloradensis* additional protection on F.E. Warren Air Force Base and other federal lands, but will do little to protect populations on state or private lands. Unlike animals, plants receive much less protection under the law. Most restrictions on harming listed plants apply just to public lands or private landowners using federal money for habitat alteration. On private lands, listed plants are protected from collection or harm by trespassers and from mis-application of some herbicides, but no restrictions exist on direct harm or habitat alteration by the landowner. Although current management actions on private agricultural lands in Laramie County are largely compatible with the needs of this species, none of the private land populations are under formal, long-term protection. Changes in management of these sites (especially subdivision) could lead to local extirpation of the plant. The survival of this species will depend on the cooperation of farmers and ranchers, but better incentives need to be developed to retain these valuable lands in agricultural production and to compensate and reward good land stewards for their actions. If this happens, the Colorado butterfly plant should continue to brighten streamsides in Laramie County for years to come.

Trifolium barnebyi by Isobel Nichols

Rupert Barneby and Duane Isely

Earlier this month, the world of botany lost two leading experts on the Legume family (Fabaceae) with the passing of Rupert Barneby and Duane Isely. Rupert Barneby worked for over 25 years at the New York Botanical Garden and was a leading authority on the Fabaceae of western North America despite having no formal training as a botanist. Beginning in 1939, Barneby and collecting partner H. D. Ripley traveled extensively in the remote corners of the western US and discovered dozens of new species (including many rare endemics). Among the Wyoming plants discovered or described by Barneby are *Astragalus drabelliformis, A. barrii, A. proimanthus, A. shultziorum, Dalea cylindriceps,* and *Oxytropis besseyi* var. *fallax*. Several species have been named in his honor, including *Lepidium barnebyanum, Lesquerella barnebyi, Cryptantha barnebyi, Castilleja barnebyana, Cirsium barnebyi,* and *Trifolium barnebyi* (a state endemic restricted to the southwestern Wind River Range and vicinity that Barneby discovered in 1947). Barneby will be best remembered for his significant contributions to the taxonomy of *Astragalus* and his treatment of the Fabales in the Intermountain Flora (Volume 3B)

Duane Isely was a professor of botany at Iowa State University and spent much of his career monographing the Fabaceae of North America. With the assistance of Stan Welsh of Brigham Young University, Isely recently completed *Native and Naturalized Leguminosae (Fabaceae) of the United States*, the most current treatment of the entire family. Isely also had a keen interest in botanical history and wrote the book *One Hundred and One Botanists* in 1994. WF

Plant Names – Part 1 By Robert Dorn

Plants were first formally named by the ancient Greeks around 300 B. C. The early names consisted of a generic name (character naturalis) followed by a short description (differentia). As an example, the tomato was known in medieval times as SOLANUM *caule inerme herbaceo, foliis pinnatis incisis, racemis simplicibus*. This method persisted for about 1900 years. As more plants became known, the system began to get cumbersome. The first use of our current two word (binomial) system was in the late 1500's and early 1600's by Jean & Gaspard Bauhin. The binomial system was not used consistently until Carolus Linnaeus popularized it in the 1700's after cataloging all of the world's known flora of about 9000 species. The tomato then became known as *Solanum lycopersicum*.

Linnaeus also introduced principles to determine the correct name for each plant species. For example, no two genera could have the same generic name and no two species in a given genus could have the same specific epithet. The first published description for a species was generally given priority, but this was not a specific principle.

Two generations of de Candolles added more principles in the 1800's, but there was still no world-wide standardization. The first international congress to resolve the standardization problem met in Paris in 1867, but standardization would not be achieved until 1930. The starting point for naming plants (except mosses and fungi) was Linnaeus' first edition of *Species Plantarum* published in 1753. Authors of plant names are generally abbreviated unless their name is short. Linnaeus is the only person whose name is abbreviated with a single letter (L.), except sometimes when a plant name is co-authored by two or more authors (for example, T. & G. = Torrey & Gray).

Physiologic Specialization in Wyoming Rust Fungi By John Baxter

This reports the results of a study of physiologic specialization in the Wyoming rust species, using urediospore and overwintered teliospores in controlled inoculations.

Uromyces junci (alternates between *Juncus* spp. and many hosts in the Asteraceae): In testing several collections, two races were differentiated. Race 1 infected *Cirsium canescens* but failed to infect *Cirsium arvense, Carduus nutans,* and species of *Helianthus.* Race 2 failed to infect *Cirsium canescens, C. arvense,* and *Carduus nutans*, but infected *Helianthus annuus, H. petiolaris, H. nuttallii,* and *H. tuberosus*. This is the first proof by inoculation of the susceptibility of *Helianthus* spp.

Puccinia menthae: A collection on *Mentha arvensis* infected *M. piperita* and *M. spicata* but failed to infect *Mentha pulegium, Hedeoma drummondii, Monarda fistulosa,* and *M. didyma.* Infection of both *Mentha piperita* and *M. spicata* demonstrates that this race differs from Race 2 (described by Baxter and Cummins, 1953).

Pucciniastrum epilobii: Field observations in the Medicine Bow National Forest indicated that there are at least two races of this rust in Wyoming, one infecting *Epilobium angustifolium* and another occurring on *E. adenocaulon*. This was confirmed by inoculations using urediospore material. Both races failed to infect *Fuschia* spp.

Reference: Baxter, J.W. and G.B. Cummins. 1953. Physiologic specialization in *Puccinia menthae*. Phytopathology 43:178-180.

Wild Bees and Floral Jewels

By Vince Tepedino
Research Entomologist, USDA Agricultural Research Service Bee Biology and Systematics Lab, Logan, UT

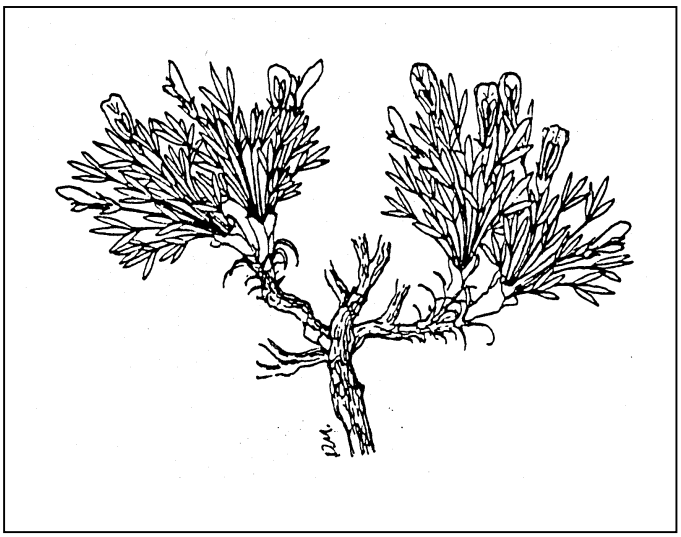
The western United States is among the richest areas of bee diversity in the world. Flower patches from the Sonoran Desert to Sierran meadows buzz softly with the paeans bees pay to flowers. Most of our wild, native bees are found in the arid regions west of the hundredth meridian: California has 1,500 species, Utah and Arizona more than 1,000 each, the Columbia Basin over 800, and Wyoming, that land of cool, dry summers and frigid winters, claims over 600 species. These insects are chosen matchmakers for plants: they have evolved in intimate association with our flora. Indeed, bees have helped shape the flora and have, in turn, been shaped by it.

What do we mean by the somewhat suspect term "native bees?" We certainly do not mean honey bees, either domesticated or feral, which are native to Eurasia and Africa, and were first established in North America in 1622. Honey bees play little part in the pollination of the rare plants bee scientists have studied. Nor should bees, which are vegetarian, be confused with their carnivorous, less hairy relatives, the wasps. The term "native bees" refers to the 3,000 to 5,000 species that are both indigenous and ubiquitous across unpaved areas of the United States.

Most native bees are solitary: they do not, like bumblebees or honey bees, live in annual colonies or perennial hives; there is no comb or honey. Because there are no workers, there is no division of labor and no aggressive defenses of the nest. Solitary thus means mostly placid females acting alone in their own best interests. These bees visit flowers for food (pollen and nectar) and, while foraging, transfer pollen from one flower to another.

In 1983, former South Dakota rancher Claude Barr capped a lifetime of fascinations and work with native plants of the Great Plains by publishing *Jewels of the Plains*. *Jewels* was Barr's apt metaphor for the bright, showy flowers that many of our usually subdued plant neighbors display when the time arrives for them to reproduce. For humans, the heady odors and brilliant hues of wildflowers enliven springs and summers on the Great Plains. For native bees, the more traditional members of the grassland community, the seasonal reappearance of flowers acts as a cue to once again assume their ongoing role in the process of natural selection – that of winged lapidaries, fashioning floral gems into jewels.

The flowers that fascinated Barr have many relatives west of the Great Plains, some of which, if not more beautiful, are even more precious. From the Colorado Plateau to the Great and Columbia basins, to the deserts



Above: Barr's milkvetch (*Astragalus barrii*) by Debbie McNeil from Schassberger (1990).

of the Southwest, there are about 150 plants so rare that they have merited special designation as threatened or endangered under the Endangered Species Act. In the Southwest, these include rare barrel cacti (*Pediocactus* and *Sclerocactus* species) that bend their stamens to form an arbor over brilliant green sweat bees that have plunged, nectar-bent, into the flower. Along riparian corridors in Utah and Colorado, orchids (*Spiranthes diluvialis*) paste packages of pollen called "pollinia" to the mouth parts of visiting bumblebees and anthophorid (miner) bees. In Nevada and Utah, small andrenid (digger) bees seek pollen from nectarless rare poppy flowers (*Arctomecon* species), and pack so much of it onto their hind legs that they look like they have been planted in yellow barrels. Blueviolet beardtongues (*Penstemon* species) in Nebraska and Colorado offer a hirsute, modified stamen that aids pollinators in exploiting the flowers, but also dissuades less trustworthy insect visitors from doing so. Four o'clock flowers (*Mirabilis macfarlanei*) in Oregon and Idaho, beyond the distribution range of their usual moth pollinator, remain open and nectar-filled into the late morning to attract miner bees.

These plant species, and the others on the list of 150, are each limited to a few small, isolated, genetically impoverished populations on federal lands. Frequently they must compete for living space, and the attention of land managers, with mining, timber, livestock, and recreational interests. Because the danger of species extinction increases as the numbers of individuals and populations decline, conserving these plants requires careful management: human caused threats may be excluded or mitigated, and informed recovery plans must

be designed and implemented that support growth in number of individuals and populations.

Recovery of any species begins with successful reproduction: extant populations cannot grow, extirpated populations cannot be restored, and new populations cannot be initiated in promising areas without a supply of new individuals. For rare plants, it is critical that these new individuals be the products of sexual reproduction, because only sexual reproduction yields individuals with new combinations of genes. Genetic enrichment of populations is all but mandatory if rare plants are to cope with the numerous environmental vagaries they are almost certain to face over long periods of time.

Because they are immobile, plants are hard pressed to produce genetically new individuals without enlisting outside aid. The scent and shape of their flowers do not serve to attract other plants. Nor do their showy blooms make better use of water or wind to move pollen. Instead, plants have flowers because their progenitors successfully reproduced by inveigling insects, birds, bats, and other animals to transport viable pollen (which contains the male zygotes) from the stamens of one flower to the female stigma of another. Not uncommonly, transfer must take place between flowers on different plants, i.e., cross-pollination, for seed-set to occur.

Over the past decade, I have been studying the reproductive biology and pollinators of rare plants in the West with several colleagues at the USDA Agricultural Research Service (ARS) Bee Biology and Systematics Laboratory and the Department of Biology at Utah State University. Our purpose has been threefold. First, we wanted to confirm that rare plants need pollinators. Some scientists have reasoned that automatic self fertilization should be a common development in rare species that produce relatively few flowers because they are less likely to attract high energy and nutrient demanding pollinators such as bees. A second objective has been to identify important pollinators of species that require them, and to learn something of their biology. Finally, we wanted to inform land managers of the importance of pollinators of rare plants, and provide advice on how best to preserve them. The first two inquiries yielded disconcertingly uncomplicated answers: the flowers of all but a few of the 27 rare plant species we have studied must be pollinated by insects to reproduce sexually, and the insects usually responsible for pollination are native bees.

Our studies of rare plant pollination, and of the matchmaking bees that accomplish it, also reveal how conservation issues can become complex, and why managing communities or ecosystems rather than individual species is so important. Conserving endangered plants, and preserving the integrity of our native flora in general, will require not only removing direct threats to the plants, but will also require preservation of their pollinators.

For bees to be successful, they must, at the very least, have adequate nesting habitat and food, i.e., pollen and nectar. Additional requirements, such as water and leaves or other extraneous materials sometimes used in nest construction, must be readily available. The first complication of note is that there is no guarantee that acceptable nesting habitat of the bee is conterminous with the habitat of the rare plant it pollinates. Indeed, they may be distant. The remedy is straightforward: we must discover where the bees nest, and offer those sites the same protection we offer the plants.

A second complication is that some plants, like the rare poppies mentioned above, offer only pollen, while others, like the four o'clocks, are visited only for nectar. Bees need both. This means that bees visiting such "single resource" rare plants must have other contemporaneously blooming species that supply the missing food item. Clearly, we must have detailed information about the biology of all participants to ensure that such supplementary species are available, and we must be prepared to use that information in a broader, community approach to conservation.

An additional complication ensues when rare species, like the riparian orchid, are pollinated by social bees, such as bumblebees. A bumblebee colony is active for a much longer period than are solitary bees. Frequently, bumblebees fly for much of the blooming season. Thus, to have a healthy bumblebee colony in July, when the orchid flowers, means the bee colony must have adequate floral resources from the time of its inception in the spring. It is therefore necessary in some cases to include a temporal component in management plans: we must ensure that an acceptable sequence of flowers is available for the entire season.

I hope these few examples convey the many facets of the problem presented by species-centered conservation efforts, and help establish the importance of a shift to community conservation. Pollination systems are among the best illustrators of this concept because of the clear interdependency of our living floral jewels and their winged lapidaries.

The Wyoming Native Plant Society, established in 1981, is a non-profit organization dedicated to encouraging the appreciation and conservation of the native flora and plant communities of Wyoming. The Society promotes education and research on native plants of the state through its newsletter, field trips, and annual student scholarship award. Membership is open to individuals, families, or organizations with an interest in Wyoming's flora. Members receive *Castilleja*, the Society's quarterly newsletter, and may take part in all of the Society's programs and projects, including the annual meeting/field trip held each summer. Dues are $7.50 annually.

To join the Wyoming Native Plant Society, return the membership form below to:

Wyoming Native Plant Society
PO Box 3452
Laramie, WY 82071

Name:
_____

Address:
_____

___ $7.50 Regular Membership
___ $15.00 Scholarship Supporting Member
($7.50 goes to the annual scholarship fund)

Wyoming Native Plant Society
PO Box 3452
Laramie, WY 82071

The Botany Songbook By John Baxter

Rubber Yucca

(To the tune of "Rubber ducky")

Rubber yucca, you're the one
You don't need soil, you don't need sun
Rubber yucca, you're handy to have around.
Plastic flowers, hear my song –
I love you 'cause you last so long
I hate bees, and the bees never hang around

In Quotes By Robert Dorn

Charles A. Geyer, Botanist
Astragalus geyeri, Delphinium geyeri
Notes on the Vegetation and general character of the Missouri and Oregon Territories made during a Botanical journey ... across the south-pass of the Rocky Mountains.... London J. Bot. 4:656. 1845.
August 1843
"An almost total absence of animal and vegetable life, and a death-like stillness pervade these regions, which together with the want of good water, of grass for the horses, and the parching sun of August, rendered this the most intolerable place I ever visited in my botanical rambles. Yet I was not disappointed, for some of the rarest specimens of plants in my collection were gathered from one solitary cliff within this region, about the junction of Ham's and Black's rivers, of the uppermost waters of the Colorado on the west."