Oxytropis nana Nutt., a Wyoming endemic collected by Thomas Nuttall on his journey across Wyoming in 1834

WYOMING NATIVE PLANT SOCIETY

Jan-Feb 1983

WYOMING NATIVE PLANT SOCIETY NEWS LETTER, Vol 2 #3

New Members and Old: Since the last newsletter Vol 2 #2 we have gained four new members. They are: Lyle King (Basin, WY), Brian Pruiett (Basin, WY), Scott Ellis (Ft. Collins, CO), and Robert Muhlenbrock (Carbondale, IL). Due to a loss of 15 members (lack of paying dues) we now have 43 active members. The cost of WNPS is $7.00 for the first year and $3.00 annually thereafter. RWL

Treasurer's Report: The last balance was $234.22. Deposits = $9.00 (Return debits from bank), $55.00 dues, cost of newsletter 2(2)= $32.90, log book = $3.12. New balance = $262.20. RWL

Other names on our mailing list: Colorado, Northern Nevada, Idaho, New Mexico, and West Virginia Native Plant Societies. RWL

Third Annual Meeting: I propose that we have our field trip at South Pass in late June to observe all the endemics in that area. If you have other suggestions for other sites, send them in before the next newsletter. RWL

1982 Field Work: Field work in 1982 was unusually productive and yielded the following new state records: Sanguisorba minor, Campanula rapunculoides, Centaurea cyaneus, Hordeum distichon and Morus alba from along Hwy 14 west of Cody; Equisetum sylvaticum from the Bighorns; Saxifraga integrifolia and Veronica arvensis and Adenocaulon bicolor from the Black Hills.

Papapaver kluanense and a possibly undescribed umbel were collected on the extremely interesting (pronghorn antelope at 11,000 ft. here) alpine tundra of Carter Mtn. south of Cody.

A very interesting sphagnum bog near Preacher Rock in the Bighorns was discovered enroute to the annual WNPS meeting. This highly unusual community supported in addition to the above mentioned Equisetum, Ledum glandulosum (second collection east of the Yellowstone-Absaroka-Beartooth area) and Eriophorum chamissonis, Juncus regelii, Carex saxatilis, C. gynocrates and C. illota these new for the Bighorns. A stop later in the day at Story to observe Cypripediums uncovered Festuca subulata and Agrimonia gryposepala both previously uncollected in this part of the state.

An unusual group of plants heretofore only collected in the NE and SE portions of the state were observed in the vicinity of Coulter's Hell and the Shoshone Canyon just west of Cody and were as follows: Chamaerhodos erecta, Parthenocissus incerta, Gypsophila paniculata, Astragalus gracilis, A. lotiflorus, Aegilops cylindrica, Dyssodia papposa, Cichorium intybus and Festuca arundinacea.

Continuing investigation in the N. Fork Shoshone River drainage area continues to unearth interesting, rare or seldom collected plants such as Stellaria simcoei, S. media, Rhamnus alnifolia, Corallorhiza wisterinana, Lepidium campestre, Avena fatua, Medicago falcata, Hypopitys monotropa, Carex backii, Ranunculus testiculatus, Geranium bicknellii, Atriplex rosea, A. hortensis, Crepis elegans and Rorippa calycina. The existence of Rorippa calycina (on the state threatened list) at Buffalo Bill Reservoir was not detected until this year when sheets of it literally thrust itself upon us in mid June. Usually by this time the mud flats along the N. Fork inlet are submerged, but not so this year due to the exceptionally late spring and consequent delay of runoff. Certainly 1982 was an exceptional year phenologically with, to cite one example, Astragalus gilviflorus, which usually blooms in mid-May, in full bloom on July 4!

Abnormal meteorological conditions of 1982 fortuitously set the stage for the discovery in N. Fork territory of what I believe may be a unique and/or overlooked micro plant community that I am calling the vernal rocky seep. These evanescent communities are situated on extremely shallow rocky soils on cliffs, ledges, and benches which are situated along vernal rivulets or seepage areas at elevations of 6,500-8,000 feet. Apparently the water source dries by mid-May and the plant life growing there becomes dormant and unrecognizable shortly thereafter.

Since I usually do not arrive in Wyoming for field work before the middle of June, this explains why I had not encountered this community before. This year, however, spring was delayed and the rivulets were rushing, the seeps were seeping and these little wet areas were teeming with species that had previously escaped my attention. This forced me to reevaluate what I had previously perceived as rather uninteresting.

Conditions were such that I was able to observe six of these little communities. Six species were invariably present on all sites observed: Allium brandegei, Lewisia triphylla, Saxifraga integrifolia, Polygonum kelloggii, Mimulus brewerii and Floerkea proserpinacoides with the exception of the Saxifrage these low growing species were present in exceptional abundance in relatively small areas with thousands of these individuals giving the appearance of a pastel carpet. Other species present and sometimes in great abundance were: Saxifraga occidentalis, Lewisia pygmaea, Orobanche uniflora, Sedum lanceolatum, Juncus bufonius, Gilia tenerrima, Epilobium glandulosum, Plagiobothrys scouleri, Myosaurus aristatus, Hydrophyllum capitatum, Mimulus floribundus, M. guttatus, Deschampsia danthonioides, Veronica peregrina, Antennaria luzuloides, Collinsia parviflora, Linanthus septentrionalis and Lithophragma parviflorum.

As can be seen from the species list, over half are annuals and almost as many are species that are restricted more or less to the NW or western part of the state. This would seem to indicate that we are dealing with a micro community that is probably unique, probably restricted to the Yellowstone-Absaroka region and almost certainly generally overlooked. EFE

More 1982 Field Work:

Collecting after the annual meeting turned up at least 11 new state records and 4 new records for the entire Black Hills. Collections below were by R. Dorn unless otherwise noted.

State Records

Crook County: Veronica arvensis (Evert, Lichvar, Dorn), Polygonum scandens (Lichvar, Dorn), Circaea lutetiana, Carex rosea, Carex peckii, Carex deweyana deweyana, Carex alopecaidea, Lycopodium complanatum, Adenocaulon bicolor (Evert, Dorn), Equisetum sylvaticum (Evert collected this one day earlier in Big Horns), Equisetum scirpoides, Polygonum bicorne (collected several weeks earlier by E. Nelson).

Laramie County: Lepidium sativum, Gypsophila scorzonerifolia

Black Hills Records: Mitella pentandra, Lycopodium annotinum, Carex alopecoidea, and Lycopodium complanatum. RDD

Dugout Gulch:

Since our October 28, 1982 newsletter, the Society has recieved a USFS report in response to our objection to a logging road in Dugout Gulch in the Black Hills. This report was compiled by Barry Johnston of the Forest Service. His conclusions in this report were mixed but positive.

He felt that none of the 14 rare species in Dugout Gulch would be candidates for a sensitive list in Wyoming, even though at this time USFS has no such designation. The only species that would qualify are those that are proposed or listed species under the Endangered Species Act or local and regional endemics. The 14 species in Dugout Gulch are peripherals so they don't qualify. As stated by Johnston, "So, you can see that, even if we had a "sensitive" species program in the region, these species would probably not be considered...".

Johnston felt that Dugout Gulch could be recommended as some kind of natural area. This was a suggestion that the WNPS came up with. This is based upon 14 rare species in conjunction with the representative eastern deciduous forest which is unique to Wyoming.

Since this 3 November, 1982 report we haven't heard anymore about our petition to protect Dugout Gulch. But this should not be the last word on the subject. RWL

Wilderness:

In early January, Interior Secretary Watt issued new directives on Wilderness which eliminated approximately 20,000 acres of BLM wilderness study areas from further consideration. Any area under 5,000 acres which is contiguous with Forest Service Rare II areas was dropped because the areas would not meet size and other criteria on their own merits. These areas accounted for the majority of acreage dropped in Wyoming. Other small acreages were dropped because of 'split estate' minerals. These lands include sections of land on which the Federal government holds the mineral rights and another entity (state or private land holder) holds the surface rights or vice versa. Most split estate lands in which only the Federal and State governments hold interest will be retained in the Wilderness Study Areas. Boundary adjustments have been made to exclude split estate lands. Watch for further developments. AA

Endangered Wyoming plant protected

Dec. 19, 1982 Casper STAR

By PHILIP WHITE
Star-Tribune staff writer

LARAMIE — A conservation easement has been granted by Monolith Portland Midwest Co. to The Nature Conservancy to protect what botanists believe is Wyoming's most endangered plant.

A University of Wyoming chemistry professor said the easement is "very good news" because he is using Laramie-area relatives of the plant in cancer research.

These related species are yielding compounds that have demonstrated some anti-tumor activity in animals, Dr. Owen Asplund said.

Monolith President William Betts in Los Angeles said Friday he has signed a document giving TNC fee title to one acre and an easement over the adjoining 19 acres. The easement transfers Monolith's development rights to TNC, thereby protecting most of the only known population of *Sphaeromeria simplex* in the world.

Robert Lichvar, rare plant expert for TNC's Wyoming Natural Heritage Program in Cheyenne, said only about 5,000 individual plants remain in a 460-acre area southeast of Laramie. The plant protection easement is probably the first of its kind in state history, he said.

"Because these few remaining plants are all clustered in one small location and because limestone mining was planned for the area, we felt that protecting this plant was our highest priority," Lichvar said. "To a botanist, this is as good as protecting a rare mammal like the black-footed ferret."

He said that about 90 percent of the remaining plants are located on the 20 acres to be protected.

LICHVAR SAID the plant is known commonly as the Laramie false sagebrush because its three-parted leaves resemble those of the sagebrush. Both are members of the composite family, but *Sphaeromeria* is much smaller than the typical sagebrush shrubs.

It is only about 3-4 inches tall and blooms in spring with small, yellow flowers.

The plant was first collected in the "Laramie hills" in 1898 by Aven Nelson, an early University of Wyoming botany professor. It was collected five times in the same area until 1907, but then seemed to disappear. Searchers checked typical habitats during the mid-1970s, but could not locate a single survivor.

Then in 1978, a state Department of Environmental Quality reclamation official made a field survey of a site which Monolith had applied to mine. Robert Dorn, himself an expert plant taxonomist, re-discovered the plant on the site.

"This agreement is a good example of how industry and conservationists can work together to preserve Wyoming's natural heritage," Lichvar said. "Monolith should be given credit for this foresight."

ASPLUND SAID he has not yet analyzed the *Sphaeromeria* because of the small numbers remaining.

"But, that is a rare and unusual resource growing out there," he said. "Once we have isolated the active anti-tumor agent in these other species we have been studying, we can analyze a small sample of *Sphaeromeria*. There is always the chance it will be a better source than the other species."

Asplund said "it is extremely important to preserve all species because living things respond to changes by drawing on the reservoir of genetic diversity."

He said three presently-approved tumor treatments come from plants and the only source of supply is through cultivation of the plants.

Lichvar's program has also been involved in agreements between federal agencies to protect a rare grass in Yellowstone and a disappearing evening primrose still found on Warren Air Force Base at Cheyenne.

He said five state plants are presently awaiting listing on the federal threatened and endangered species list.

Laramie False Sagebrush:

Due to extremely large amounts of time and effort by Bob Kiesling, Bob Dorn, Mark Stromberg, and Bob Lichvar, the rarest and most threatened plant in Wyoming has been protected. This finalizes five years of effort and coordination on the parts of industry, state government and a private conservation group to protect a unique member of the state natural heritage. And finally, only Phil White with his extreme desire to aid the environment in his own way, could do such a nice job to a story like this one.

RWL

Bogs & Fens in Wyoming:

Bogs and fens are relatively scarce in Wyoming. The purpose of this article is to briefly describe known occurrences in the state.

The 40 acre Sawtooth Palsa-fen complex referred to in the last WNPS Newsletter, occurs in a subalpine basin in the Beartooth Mountains at an elevation of 9,700 feet. It consists of a raised peat bed (palsa) bordered by thaw depression pools (thermokarst) and fen vegetation surrounded by subalpine wet meadow. The palsa is elevated 4 to 6 feet above the surrounding meadow, is characterized by frost polygons 6 to 10 feet in diameter, and is practically devoid of vegetation. Permafrost underlies the peat at a depth of 15 to 18

inches (Pierce 1961). The combination of a palsa, the associated frost-heaving features, and the presence of permfrost is believed to be the only known such occurrence in the contiguous United States.

Carex praeceptorum, C. scopulorum, C. illota, and C. aquatilis dominate wetter areas of the fen. Other species present include Caltha leptosepala, Senecio cymbalarioides, Pedicularis groenlandica, and Polygonum viviparum.

I know of four other fens in Wyoming. More are likely to occur, but their existence has not been documented in the literature. None of the known fens is underlain by permafrost, nor do any of them exhibit the features associated with frost heaving that are characteristic of the Sawtooth Palsa-fen. Elk Creek fen is located in the Medicine Bow Mountains at an elevation of 9,800 feet (Sturges 1968a, b). The 3 acre spring-fed fen is surrounded on three sides by a lodgepole pine-Engelmann spruce-subalpine fir forest and by a montane wet meadow downslope. Two plant communities, one dominated by spikesedge (Eleocharis pauciflora) and one dominated by sedges (Carex aquatilis, C. illota, C. rostrata) and marsh marigold (Caltha leptosepala) comprise the fen vegetation.

The three other known fens occur in basins. Ice Slough is located approximately 10 miles east of Sweetwater Station at an elevation of 6,420 feet. Historically, it was dominated by various herbaceous species. Today, the fen is cut in half and drained by a canal. It has been heavily grazed and is presently dominated by various grasses (Agropyron sp., Spartina gracilis), and rushes (Juncus spp.). Two small fens are located in the Laramie Basin (Beiswenger 1983). A small, seep-fed Carex fen occurs at an elevation of 7,200 feet. An undescribed spring-fed fen occurs on Sheep Mountain at an elevation of 7,440 feet. The latter 2 fens are both characterized by floating mats.

I have been able to verify the occurrence of 5 Sphagnum bogs in the state. These differ from fens by the presence of Sphagnum spp. and have more acidic water. A subalpine Sphagnum bog occurs along the shore line of Leigh Lake at an elevation of 6,900 feet (Dorn, 1983). A spruce forest surrounds and shades the bog, which is composed of a mat of Carex spp. and Sphagnum sp. that is springy to walk on. Shaded pockets of stinking water support Drosera anglica and Utricularia minor. The remainder of the bog is a floating Sphagnum mat. Boreal species, such as Salix spp., Carex spp., Vaccinium occidentale, and Lycopodium annotinum are a distinguishing feature of this bog. Another subalpine bog, located on Red Mountain at an elevation of 9,500 feet (Christiansen 1983), is open and surrounded by rocky terrain. Species present include Sphagnum sp., Carex sp., Nuphar polysepalum, and Menyanthes trifoliata.

An ericaceous shrub complex on Sphagnum and surrounded by a lodgepole pine forest occures in Yellowstone National Park at an elevation of 8,000 feet (Lichvar 1983). The bog is spongey and supports a number of montane and boreal species, such as Vaccinium membranaceum, V. globulare, V. scoparium, Pyrola picta, Ledum glandulosum, Equisetum laevigatum, and Eriophorum viredicarinatum. Floating Sphagnum mats are also known to occur elsewhere in the park (Despain 1983).

Two montane bogs are known to occur in the state. A bog near Sylvan Pass (elevation 8,400 feet) is surrounded by a spruce-fir forest. The bog is open to shaded with standing water to a "boggy" surface present. Species present include Eriophorum chamissonis, Ledum glandulosum, Isoetes bolanderi, Vaccinium scoparium, and V. membranaceum (Lichvar 1983). Preacher Rock bog is located in the Big Horn Mountains at an elevation of 8,200 feet (Evert 1983). This 20 acre bog is bordered by an Engelmann spruce-subalpine fir swamp forest. Several species found in this bog in 1982 such as Equisetum silvaticum, Juncus regallii, Eriophorum chamissonis, Carex saxitilis, C. illota, and C. gynocrates were previously unknown from the big Horn Mountains or represent new state records.

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EC

Botanical Novelties - Hayden, Ferdinand V.

Most early collectors made only one trip through Wyoming. F.V. Hayden, a geologist-naturalist for the Corps of Topographical Engineers, made several major expeditions in Wyoming. During each trip besides collecting geological data he he also managed to gather plant specimens which were later identified by renowned botanists back east. Due to the amount of information available on Hayden, our series will be divided into two parts. The first part in this series will include the expeditions to the Black Hills, the Big Horn Mountains, and upper Yellowstone country (Dorn, R. 1977 & J. Dorn 1978).

In 1855, F.V. Hayden, a geologist-naturalist, visited the edge of the Black Hills while doing independent study in the region. He apparently was the first naturalist to collect plants in the Black Hills.

About September 4th of 1857, Lieutenant G.K. Warren of the Corps of Topographical Engineers left Fort Laramie and headed for the Black Hills with a party of about 20 men including F.V. Hayden. They entered the hills along a branch of Beaver Creek near the present Newcastle, Wyoming, and proceeded north about 30 miles to Inyan Kara Mountain. Near here they met a large force of Dakotas. Their entry into the hills was in violation of the treaty which General Harney had worked out only in the previous year. The party was fortunate to be allowed to retreat without harm. They retraced their route south and turned east at the south end of the hills. After two days they were overtaken by Bear's Rib, a head chief of the Sioux. He agreed to accompany them along the east flank of the hills to Bear Butte at the northeast corner of the hills to assure their safety. They then headed southeast out of the area. Warren was not hesitant about entering the area, treaty or no treaty. He later wrote, "The advance of the settlements is universally acknowledged to be a necessity of our national development, and is justifiable in displacing the native races on that ground alone." Only a few plants were collected by Hayden.

The next expedition that Hayden was involved in Wyoming was the Raynold Expedition: 1859-1860. This was the last major exploring expedition in the west conducted by the Corps of Topographical Engineers. Hayden again acted as naturalist and surgeon. From J. Dorn (1978):

"The expedition members assembled at St. Louis, Missouri, and steamed upriver to Fort Pierre, South Dakota. They spent 10 days at Fort Pierre outfitting the expedition and bargaining with the Dakota Sioux for permission to cross their lands. On June 28 the small party of scientist-explorers, with an escort of 30 infantrymen, marched westward from the fort toward the Cheyenne River. They traveled north and west across the Cheyenne drainage and entered the northeast corner of Wyoming on July 14 near the Brakes of the Black Hills. They traveled north to the Belle Fourch River and followed that stream west to its great southward bend. Raynolds continued west across the Little Missouri River to the Little Powder River and followed the latter stream north out of the state on July 25. The expedition continued north to Fort Sarpy on the Yellowstone River where Raynolds replenished the supplies.

On August 31 they left Fort Sarpy and headed south up the valley of the Big Horn River. On September 2, Captain Raynolds divided the party. Lieutenant Maynadier, the second in command, led a party that included Hines and Trook to explore the Powder River drainage. Raynolds, with the remaining men, continued south along the east flank of the Big Horn Mountains. The two parties reunited October 12 near Red Buttes on the North Platte River.

Raynolds established a winter camp for the entire expedition on Deer Creek (southwest Converse County) a few miles from the North Platte River. From October 19 to November 4 a party of eight men, including Hayden, explored the region between the Platte and the headwaters of the Cheyenne River. Another small party, again including Hayden, explored the region between the Platte and the upper Powder River from March 29 to April 7, 1860.

The entire expedition left winter quarters on May 10. They were again divided into two parties as during the previous fall. Captain Raynolds headed west toward the Wind River, while Lieutenant Maynadier party followed the trail along the Sweetwater River until a gap in the hills permitted them to turn north toward the Popo Agie River. At the mouth of the Popo Agie they reunited briefly with Captain Raynolds' party.

From the mouth of the Popo Agie, Raynolds continued west up the Wind River. He had hoped to cross the mountains into the valley of the upper Yellowstone River, but huge snowdrifts blocked the way. Instead, he was forced to ascend the Wind River and cross the Continental Divide onto the head of the Gros Ventre River at Union Pass.

From Union Pass, Raynolds' party followed the Gros Ventre River to its confluence with the Snake River in Jackson Hole. They left the state on June 18 via Teton Pass and proceeded north to a rendezvous with Lieutenant Maynadier's party at the Three Forks of the Missouri in Montana.

From the mouth of the Popo Agie River, Lieutenant Maynadier followed the Big Horn River north. On June 5 they left the valley of the Big Horn near the mouth of the Greybull River and proceeded northwest across the Shoshone River toward Calark's Fork of the Yellowstone. They followed Clark's Fork out of the state on June 12."

Plants collected from the Raynolds expedition were identified by G. Engelmann in St. Louis, Missouri and by Torrey in New York. One species that is of high interest of local botanists today was taken on this trip. Rorippa calycina Engel. was collected on "sandy bottoms of the Yellowstone River, Fort Sarpy to Fort Union." This species is a proposed Threatened species from Wyoming and Montana.

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RWL

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