

Proceedings

Fourth Montana Plant Conservation Conference

February 28 through March 1, 2006 • Great Northern Hotel, Helena, Montana



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The Fourth Montana Plant Conservation Conference will focus on the status, conservation and restoration of rare and endangered plants. The purpose of the conference is twofold: (1) to provide information on the conservation of plant species of concern to managers and the public, and (2) gather information from professional and amateur field botanists that will aid in the conservation of these species.



The Mission of the Montana Natural Heritage Program is to be Montana's source for reliable, objective information and expertise to support stewardship of our native species and habitats, emphasizing those of conservation concern.



The mission of the Montana Native Plant Society is to preserve, conserve, and study the native plants and plant communities of Montana, and to educate the public about the value of our native flora.



Helping People Help the Land. The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

Illustration of *Epipactis gigantea* by Hope Hornbeck.

Schedule

Tuesday February 28 (morning)

- 9:00-9:10 Welcome & Introduction (Susan Winslow, MNPS President)
- Symposium: Montana Plant Conservation Background & Updates (Scott Mincemoyer, MTNHP)**
- 9:10-9:40 Montana Natural Heritage Program & Species of Concern (Scott Mincemoyer, MTNHP)
- 9:40-10:00 U.S. Forest Service (Steve Shelly, USFS)
- 10:00-10:15 Bureau of Land Management (Nora Taylor, BLM)
- 10:15-10:30 Question & Answer
- 10:30-10:50 Break
- Symposium: Status of Federally Listed Species (Scott Mincemoyer, MTNHP)**
- 10:50-11:05 ESA Recovery Plans, Listing, Delisting etc. (Lori Nordstrom, USFWS)
- 11:05-11:15 *Botrychium lineare* (TBA)
- 11:15-11:30 *Howellia aquatilis* (Linh Hoang, USFS)
- 11:30-11:45 *Silene spaldingii* (Scott Mincemoyer, MTNHP)
- 11:45-12:00 *Spiranthes diluvialis* (Walt Fertig)
- 12:05-1:00 Lunch

Tuesday February 28 (afternoon)

- Workshop: Developing Threat Ranks for Species of Concern**
- 1:00 - 1:15 Introduction: Purpose, Background and Query Summaries (Maria Mantas, TNC)
- 1:15 - 1:30 Montana Natural Heritage Program Approach: How MTNHP and NatureServe Incorporate Threats into Species' Ranking (Scott Mincemoyer, MTNHP)
- 1:30 - 1:45 Idaho Native Plant Society Model (Michael Mancuso, Idaho Conservation Data Center)
- 1:45 - 2:00 Other Approaches: California Native Plant Society, etc. (Maria Mantas)
- 2:00 - 2:20 Break
- 2:20 - 3:30 Workshop: Determine Criteria; Test Model; Finalize Threats Ranking Criteria
- 3:30 - 3:45 Break
- 3:45 - 4:30 Nominate Species to be Ranked for Threats
- 4:30 - 5:00 Workshop Wrap-up, Discussion

Wednesday March 1 (morning)

- 9:00-10:00 Rare Plant Habitat Modeling (Walt Fertig & Scott Mincemoyer, MTNHP)
- 10:00-10:30 Break
- Symposium: Sensitive Species Habitat Restoration (Peter Husby & Susan Winslow, NRCS)**
- 10:30-10:50 Cultural and Establishment Trial of Colorado Butterfly Plant (Susan Winslow, NRCS)
- 10:50-11:10 Prescribed Fire and Conservation of Spalding's Catchfly (Peter Lesica, UM)
- 11:00-11:30 Farm Bill and Sensitive Species Habitat Restoration (Peter Husby, NRCS)
- 11:30-11:45 Questions
- 11:45-1:00 Lunch

Wednesday March 1 (afternoon)

- Symposium: Critical Plant Areas (Peter Lesica, UM)**
- 1:00-1:15 Audubon's Important Bird Areas Program (Susan Lenard, Montana Natural Heritage Program)
- 1:15-1:30 European Model (Peter Lesica, UM)
- 1:30-1:45 Forest Service Natural Areas and Special Botanical Areas Programs (Steve Shelly, USFS)
- Workshop: Critical Plant Areas**
- 1:45-3:00 Determine Criteria for Listing
- 3:00-3:15 Break
- 3:15-4:45 Nominate Areas and Provide Support
- 4:45-5:00 Workshop Wrap-up

Abstracts

Status of Federally Listed Species: *Spiranthes diluvialis*

Walter Fertig, Kanab, Utah

Ute ladies'-tresses (*Spiranthes diluvialis*) was listed as Threatened under the Endangered Species Act in January 1992. At that time, this species was known from 10 extant and 7 extirpated populations in Colorado, Utah, and Nevada. Total population size was estimated at 6000 plants and nearly all populations were considered highly threatened by urban sprawl and development of stream and wet meadow habitat. In the years following listing, additional field surveys and monitoring greatly increased the number of known populations, total population size, and the global range of the species. Today, Ute ladies'-tresses is known from 52 extant populations (with over 100 subpopulations), approximately 83,300 individuals, and is found in eight states (including Idaho, Montana, Nebraska, Washington, and Wyoming). New monitoring and demographic research have documented that populations are more stable than originally suspected and more adapted to disturbance (both natural and human-induced). Many populations are still threatened to some degree, with competition from invasive species, vegetation succession, construction, and changes in hydrology now considered the main impacts. About 35% of all known occurrences are found in protected areas or afforded some form of special management attention. The US Fish and Wildlife Service was petitioned to delist this species in 1996 on the grounds that it was sufficiently widespread and secure to not warrant protective status. As of December 2005, the Service is moving forward with a proposal to delist.

Rare Plant Habitat Modeling

Walter Fertig, Kanab, Utah and Scott Mincemoyer, Montana Natural Heritage Program, Helena, Montana

Predictive modeling of plant distributions rests on the assumption that correlations exist between the presence/absence of a species and selected climate, topographic, substrate, and land cover variables. Once these underlying patterns are determined, maps can be created in GIS that identify areas that meet the specific conditions hypothesized for a given species. Such maps can be used to prioritize areas for field surveys of rare plants or assist land managers

in project clearance activities. Using classification tree analysis, we developed correlational models for 44 Wyoming plant species listed as BLM Sensitive or Threatened and Endangered under the Endangered Species Act. Presence/absence of each species was the response variable in the models and was derived from location records of the Wyoming Natural Diversity Database and Rocky Mountain Herbarium. Environmental variables, including total monthly precipitation, average monthly air temperature, monthly shortwave radiation, number of wet days, growing degree days, local topographic relief, bedrock and surficial geology, soils, elevation, and land cover, were used as predictors. Location data were randomly subdivided into model-building and validation data sets to test the classification success of the final models. We found that the distribution of rare species in Wyoming was most strongly correlated with specific bedrock and soil types, but was also influenced by topographic relief, land cover, and various monthly precipitation and temperature values. Overall, our models were conservative in the area predicted for these species and typically had low commission error rates. The distribution maps produced by correlational modeling did an excellent job of identifying areas where rare species are unlikely to occur and did a good job of highlighting areas of potential habitat that warrant on the ground survey.

The USDA Farm Bill and Sensitive Plant Species Habitat Restoration

Peter Husby, Natural Resources Conservation Service, Bozeman, Montana

After a very brief overview (for the primarily public lands agency representatives in the audience) of what the Farm Bill is and who NRCS is, this presentation describes how some Farm Bill Conservation programs are, in part, designed to further sensitive plant species habitat restoration. Programs described include the Wildlife Habitat Incentives Program (WHIP), the Wetlands Reserve Program (WRP), the Grassland Reserve Program (GRP), the Environmental Quality Incentives Program (EQIP) and the Conservation Security Program (CSP). The purpose of WHIP and EQIP specifically includes sensitive species conservation and the other programs indirectly benefit many sensitive species by

restoration/improvement of native ecosystem health. Extra points are awarded in the ranking criteria for a number of these programs for projects which directly involve conservation of sensitive plant and animal species.

Prescribed Fire and Conservation of Spalding's Catchfly

Peter Lesica, University of Montana, Missoula, Montana

Prescribed fire is often used to restore grassland systems to presettlement conditions; however, fire also has the potential to facilitate the invasion of exotic plants. Managers of wildlands and nature reserves must decide whether and how to apply prescribed burning to the best advantage in the face of this dilemma. I studied the effects of spring and fall fires on *Silene spaldingii*, an endangered perennial herb at Dancing Prairie, a grassland preserve in northwest Montana, and *Potentilla recta*, an exotic plant invading these grasslands. Individual *S. spaldingii* plants were mapped, and size and flowering were recorded for one year prior and five years subsequent to burn treatments in sample plots. A 70-400% increase in seedling recruitment and a 22% increase in population size were the principal effects of fire on *S. spaldingii*, and fall burn plots had lower recruitment than spring burn plots. Fire had no detectable effect on the survival of adults or recruits of *S. spaldingii*. In a subsequent study I measured the effects of fire and season of burn on the recruitment and population growth of *P. recta* over a five-year period. Recruitment of *P. recta* was higher in burn plots compared to controls the first year after the fire and higher in fall compared to spring burn plots across all years. Results suggest that prescribed fire has a positive effect on the population dynamics of *S. spaldingii*, and can enhance germination of *Potentilla recta*. Controlled fire should be conducted in spring when there is a greater positive effect on *S. spaldingii* and a smaller positive effect on *P. recta*.

Critical Plant Areas: The European Model

Peter Lesica, University of Montana, Missoula, Montana

The goal of the Important Plant Areas (IPA) program is to identify and protect a network of the best sites for plant conservation throughout Europe and the rest of the world. It is part of the Global Strategy for Plant Conservation adopted by the Convention on Biological Diversity held at the Hague in 2002. IPAs are intended to be areas of great

importance for threatened plants and plant diversity that can be identified, protected and managed as sites. There are three criteria for designation: (1) supports one or more species of global or European conservation concern, (2) exceptionally rich flora relative to its biogeographic zone, (3) an outstanding example of a habitat type of global or European conservation concern. Thresholds for satisfying these criteria are quantitative and as objective as possible. For example, to fulfill criterion (1) a site must encompass at least 5% of the known national population of a threatened species and must be thought to be a viable population of that species. There are also guiding principles for prioritizing sites under each criterion. For example, populations at the core and edge of a species range should be included. The IPA database is the main tool for collecting, analyzing and disseminating data about the project. Data are collected from experts or literature and put into standardized "site reports." The IPA inventory is dynamic and designations may change based on new information. Selection of Important Plant Areas is done by a national IPA team based on the three criteria and following the guidelines. Selection of sites should be based on sound data and consider the long-term sustainability of the sites' values. An example from Eastern Europe will be presented.

Assigning and Using Threat Ranks for the Idaho Rare Plant List

Michael Mancuso, Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, Idaho

Efforts to produce a list of Idaho plant species of conservation concern began in the 1970s. The Idaho Rare Plant List has proven to be dynamic over the years, with annual review and updates occurring since 1984 at the Idaho Rare Plant Conference, now sponsored by the Idaho Native Plant Society (INPS). The list has evolved to include three main divisions – globally rare, state rare, and review species. Each globally rare species that is not federally listed as Threatened or Endangered receives a Threat Priority rank. This one-through-twelve ranking is based on the old U.S. Fish and Wildlife (USFWS) listing priority system of threat magnitude, threat immediacy, and taxonomic factors. Threat rank assignment is subjectively determined for each species using an expert opinion format that ideally integrates available population, life history, habitat condition, degree of

protection, threat factor, and any other relevant information. Theoretically, everyone in attendance at the Rare Plant Conference makes up the body of expert opinion. In reality, usually only one or a few people most familiar with the species participate in the discussion leading to threat rank assignment. Nonetheless, it is an open and transparent process. Threat ranking has helped the INPS make and prioritize recommendations to the USFWS for the federal Candidate list and for other conservation efforts. The threat ranking system used by the INPS will be reviewed. The relationship of threat ranks to NatureServe conservation ranks, examples of using threat ranks for conservation purposes in Idaho, and limitations and problems Idaho threat ranking poses will also be discussed.

Developing Threat Ranks For Species of Concern

Maria Mantas, The Nature Conservancy of Helena, Montana

Much effort has been placed on developing methods to assess the status of rare species. In the past, the main criteria for assessing a species status was population size and/or number of occurrences. As of late, however, more focus has been placed on the condition of plant populations as well as mere numbers. This workshop has been designed for the purpose of developing a protocol for assessing threats to rare species in order to better evaluate their conservation concern. For example, a rare endemic plant that grows in a small population in an alpine region of a national park may be far fewer in numbers but more secure than a more widely spread species that occurs in grassland habitats threatened by development. By assigning a threats rank we can better prioritize conservation action for rare species. Prior to the conference, Montana botanists were queried for their knowledge regarding threats to Montana Natural Heritage Program listed Species of Concern. A brief summary of the results of this query will be presented. We will then be introduced to methods used by other organizations (i.e. the Montana Natural Heritage Program, and the Idaho Native Plant Society) who use threats to ascertain the status of rare plant species. These talks will be followed by a workshop to develop a threat ranking system for Montana. If time allows, we will test the new protocol for a few species of concern with information gathered prior to the conference.

Plant Conservation on National Forest Lands in Montana

J. Stephen Shelly, USDA Forest Service, Northern Region, Missoula, Montana

National Forest lands play a critical role in providing habitat for rare plant species in Montana. Conservation of these species and their habitats is provided through land management project design and evaluation, conservation assessments and strategies, inventories and monitoring, Forest planning, and designation of protected areas. There are 109 plant taxa in Montana that are designated as sensitive by Region 1 of the U.S. Forest Service, and there is one federally listed species (*Howellia aquatilis*) known to occur on National Forest lands. "Hot spots" for rare plant occurrences on National Forest lands include areas in southwestern Montana, the Swan Valley, and the Pryor Mountains.

U.S. Forest Service Research Natural Areas and Botanical Special Interest Areas in Montana

J. Stephen Shelly, USDA Forest Service, Northern Region, Missoula, Montana

The Research Natural Area (RNA) program is one of the oldest formal programs in the U.S. Forest Service. Since 1927, RNAs have been designated to build a national network of ecological areas protected in perpetuity for research and education purposes, and as a tool for conserving biological diversity. To date, 106 RNAs have been designated in Region 1 (Montana, northern Idaho, North Dakota, South Dakota), protecting a total of approximately 148,000 acres. Sixty-four of these RNAs, protecting 90,198 acres, are located in Montana. The objective of the RNA program is to protect representative examples of the vegetation types and natural plant communities, and habitats with special characteristics of scientific interest, found on National Forest System lands. In Region 1, RNA designation has emphasized protection of forest, grassland, and shrubland habitat types, as well as alpine and aquatic features. Botanical Special Interest Areas (SIAs) are also designated to protect unique botanical features. Twenty-six Botanical SIAs have been designated in Region 1, with 21 located in Montana. Botanical SIAs are typically established to protect unusual plant communities

or populations of rare plant species for interpretive or educational purposes. Together, these designated RNAs and SIAs represent one of the largest reserve networks in Montana outside of federal wilderness areas. Additions to this network are needed, especially for aquatic habitats and rare species.

Plant Conservation on Lands Administered by the Bureau of Land Management in Montana

Nora Taylor, Bureau of Land Management, Billings, Montana

The Bureau of Land Management (BLM) manages approximately 8 million acres in Montana. Most of this is in the southwest and the east side of the state. The overarching objective of the BLM sensitive plant program is to ensure that BLM actions do not contribute to the need to list species as threatened or endangered. There are no known sites of federally listed plants on BLM land in Montana. The Montana/Dakotas State Director has designated 103 Bureau sensitive species for Montana and North and South Dakota. For eleven of these species, all known element occurrences are found on BLM-administered land. For another twelve species, 60% or more of the element occurrences are on BLM land. The majority of the EOs occur in the Dillon, Billings and Miles City Field offices. Inventory for special status plants are on-going. Inventories are primarily being conducted by the Montana Natural Heritage Program with the priority being in areas with increasing development and in offices beginning Land Use Planning efforts. This will allow us to develop management objectives and actions that can be incorporated into the land use plans at the beginning of the process.

Cultural and Establishment Trial of Colorado Butterfly Plant

Susan Winslow, Natural Resources Conservation Service, Plant Materials Center, Bridger, Montana

In 1996, the USDA Natural Resources Conservation Service's Plant Materials Center (BPMC) in Bridger, Montana, began working with the Wyoming Interagency *Gaura* Working Group on the potential seed increase of

Gaura neomexicana ssp. *coloradensis*, a candidate species proposed for listing as threatened under the Endangered Species Act. Seed was collected that year at two sites on the F.E. Warren Air Force Base near Cheyenne, Wyoming. One site was a population of "challenged" plants that were smaller-statured or browsed, and the other site was a "normal" population of plants assessed as healthy and mature. The seed was sent to the BPMC for propagation, determination of cultural requirements, evaluation of plant performance, and seed increase. In May 1997, two plots were established, each in 3 rows, 3 feet (0.91 meters) apart, with 100 seeds planted every 6 inches (15.2 centimeters) at an approximate depth of 1 inch (2.5 centimeters). The rows were oriented to the prevailing north to south wind and separated east to west by 50 feet (15.2 meters) to minimize outcrossing. Supplemental sprinkler irrigation was applied to keep the plots moist and weeds were removed as necessary. Seedlings began to emerge two months after planting, with seed germination in the challenged plot at 3 percent, while germination was more than doubled at 7 percent in the normal plot. Rosette widths were 4 to 6 inches (10 to 15 centimeters) in the first growing season and winter survival was 100 percent in both plots. In 1998, flowering heights were 2 to 3 feet (0.61 to 0.91 meter), and initiation of the four-petaled, whitish-pink flowers occurred from early July until the onset of freezing temperatures in October. Seed harvest was initiated on August 10 and seed readiness was monitored on a daily basis due to the extreme degree of indeterminate phenology in this monocarpic, short-lived member of the Evening Primrose Family. The plants in the normal plot produced 3 ounces (85 grams) of seed, while the challenged plot produced no viable seed. There are approximately 59,000 very hard, four-angled, dark brown to black, nut-like seeds per pound (130,000 seeds per kilogram). The US Fish and Wildlife Service listed this rare plant as threatened under the Endangered Species Act in October 2000, at which time they determined that until a final designation was made on critical habitat, continued existence of the BPMC planting and seed storage was legal. The challenged plot was removed in 1999, and the normal plot continued its reproductive mode until removal in 2001. After 7 years in storage, a tetrazolium test indicated that 87% of the seeds remain viable.

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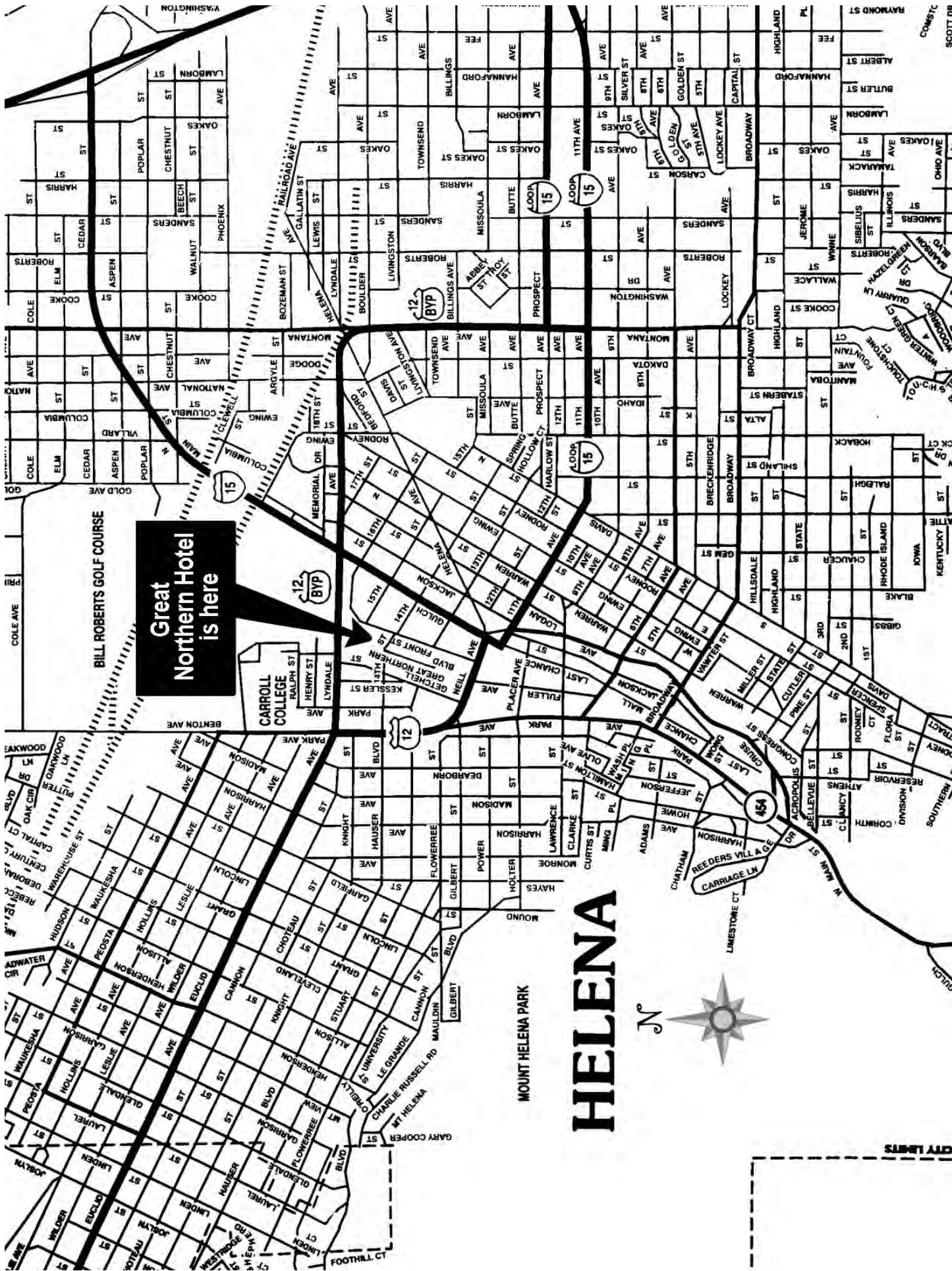
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