

**1999 EXOTIC PLANTS SURVEY AND ERADICATION
PROGRAM REPORT
BRYCE CANYON NATIONAL PARK**

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Juli Ames-Curtis, Biological Technician

INTRODUCTION

Non-native plants species have become a part of the landscape in the United States. Thousands of acres per day are invaded with these "exotic" plants. When non-native plant species come into an area, they change the composition of the native flora and fauna. Many times change the composition of the soil inhibiting reintroduction of native species.

In an effort to maintain a native ecosystem at Bryce Canyon National Park, a comprehensive survey of the non-native plant species was undertaken in 1998. The goal of the study was to locate the populations and institute an action plan for eradication. The goal of the plan is to eradicate species where feasible and control other species to "manageable" levels. At Bryce Canyon National Park, the invasion of exotic plants is at a stage where this goal is reachable. While we do have numerous sites where exotics have invaded, most sites have small infestations.

The summer of 1999 saw the implementation of the eradication plan on a larger level. The five member biological technician staff consisting of Nancy Mitton crew leader, Ellie Soller, Carol Fields, Liz Lloyd and Juli Ames-Curtis were able to devote a considerable amount of time in the field eradicating species at sites identified in previous years. A total of 59 sites were treated at least once and a good number of these sites were visited two to five times. The total area treated equals 11.018 square hectares (see attached table).

METHODS

Following recommendations set up by Buchanan and Kitchen in October 1998 (1998 Baseline Inventory of Selected Locations and Exotic Plant Species in Bryce Canyon National Park), sites were visited (as schedules allowed) at the optimal time for

treatment. These windows of opportunity for treatment varied for species and location in the park. Plants growing at lower elevations were usually treated earlier in the season. With some species it is easier to identify when the plants are blooming, yet it important to take control action before the seed is set.

Each species and each site has a separate site number. Information for each site is recorded on an Exotic Plant Data Form developed during the summer of 1998. From these forms and quadrangle maps, Lead Biological Technician Nancy Mitton developed an Exotics Eradication in Progress tally sheet (see attached) to help keep track of visits to sites. This tally sheet included the species, site #, date of treatment, # of plants removed, general location, who participated in the control action, and last year's activity. When new infestations were located, a site number was assigned and appropriate forms filled out. It was also necessary to document the new location on the master set of quadrangle maps kept in the biotech office.

Most of the species were treated mechanically, either hand pulling, and/or using a Pulaski or shovel. If there was no evidence of seed set, the plant was left on the ground in the area treated. If seed set was present, the seed head was cut off and sealed in a plastic bag. Some species required that the whole plant be discarded of in a sealed plastic bag. These bags were then taken to the historic garage for storage until they degraded and could be burned.

The entire biological technician crew of Mitton, Fields, Lloyd, Ames-Curtis and Soller performed mechanical treatment of sites. Many of these sites required numerous returns to keep the population in check. At times Sierra Club volunteers and Bryce Canyon National Park Youth Conservation Corps (YCC) crewmembers Crystal Burton, Kathleen Burton, Easton Perkins, Justin Woolsey, and Roy Seals assisted the staff. The volunteer crews helped in sites of large infestations such as the Swamp Canyon area (1000's of bull thistle). The developed area was also an area that consists of many sites and required long hours of shoveling, swinging a Pulaski, or hand-pulling.

Soller and Ames-Curtis chemically treated two species, (*Cardaria draba* and *Convolvulus arvensis*) with 2,4-D. Both Soller and Ames-Curtis hold current State of Utah IPM licenses. A backpack sprayer was used in the chemical treatment. Mixing and cleanup took place in the area directly

west of the paint room in the maintenance yard. The water source and hose in the Park Protection stall of the fire cache was used to triple clean all equipment. Soller and Ames-Curtis wore PPE at all times when dealing with the chemical.

DISCUSSION

It is too early for most sites to form any conclusions about the success or failure of the program to date. While some control actions have taken place since 1989, only a few species in a few locations were targeted. Beginning in 1998, Detailed documentation of each site was established and continued in the summer of 1999.

There are two sites that could be considered successes to date. Of course, this is with limited data, yet there appears to be a sharp decline of the exotic species in both of these sites.

The first site is CANU-001-BC. It is located west of the historic gas station and contains a population of musk thistle (*Carduus nutans*). Control actions have taken place at this site since 1996, yet numbers for this site have only been documented in 1998 and 1999. In 1998, 78 plants were removed from this area encompassing an area 16 X 20 meters. In 1999, the area of infestation had shrunk to 3 X 4 meters and just 8 plants were removed. Ames-Curtis was involved in the treatment of this site in 1997 and remembers eradicating 100+ plants. In 1998, historic preservation construction work began on the gas station. The area of concern was greatly disturbed and the sagebrush meadow has not regenerated.

The second site is VEBR-001-BC. It is located east of Quarters 27 and contains a population of prostrate vervain (*Verbena bracteata*). In 1998, Laurie Kurth, then Botanist at Zion National Park, suggested this area be put on "watch". According to Kurth, prostrate vervain can spread very fast if not kept in check. In September of 1998, 600 mature plants were removed (hand pulled). In August of 1999, only 200 seedlings were removed. It is important to note that in September of 1998, the area contained a 30% vegetative cover, 35% of which was prostrate vervain. In August of 1999, the vegetative cover was 80% and less than 5% was infested with prostrate vervain. During the summers of 1997 and 1998, the tall grass in this area was considered a fire hazard and mowed frequently. The seed was never able to mature, thereby creating less vegetative cover. This area was not mowed from

September 1998 to present. The native grasses planted after construction in this area have flourished and fewer exotic species were noted (in past years *Salsola iberica*, russian thistle had been present in large numbers, 1999 saw a decrease in these numbers also).

RECOMMENDATIONS

Priority for treatments-in the following order:

1. Small populations along the roadsides.
2. Large populations along the roadsides.
3. Riparian areas.
4. Developed areas.
5. Backcountry sites.
 - Trails
 - Campsites
 - Boundary

To complement the prioritization, the attached Recommended First Treatment Date for Exotic Plant Sites and Exotics Eradication in Progress can be used. These documents list the species, general locations, dates to remove or dates of treatment, numbers removed, etc. The Exotics Eradication in Progress helped staff keep track of progress and what sites needed to be addressed.

Within all of the above locations is the need to prioritize species to target. Reference to the ranking system (Hiebert and Studdendieck, 1993) starting on page 46 in the 1998 Baseline Inventory and the diagram on page 17 of the same report will aid in this process.

Other Projects

1. Document Data
 - Compile Exotic Plant Data Forms on to computer database.
2. Educate others
 - Create a display for the new visitor center. One suggestion from 1998 was to laminate plant specimens or place them over cotton in plastic-fronted boxes for visitors (and staff) to browse through.
 - Create an interpretive program for visitors. Once a month, each Biotech give an evening or daytime program.

- Give a presentation on current exotics program at Bryce Canyon NP during orientation for Interpretive Rangers.
- Write an article for the Hoodoo or create another volume of Bryce Breaks, the Resource Management newsletter begun in 1997.
- Give a presentation on current exotics program at Bryce Canyon NP during a park staff meeting.
- Photograph exotic species. These slides could be used in many interpretive programs.

3. Inventory/Surveys

- Coordinate with Cas to have YCC crew works with Biotech crew every Friday. The maintenance crew (who supervises the YCC crew) works four, 10-hour days in the summer. In the past, the YCC crew has been short on projects on some Fridays.
- Expand our volunteer program to encompass more than just a week of Sierra Club volunteers working with our division.
- Consider a contest for employees. Zion NP conducts an "Exotics Extravaganza" every year, in which participants collect certain non-natives and compete for prizes for the most plants gathered.
- Use Recommended 2000 Exotic Plant Projects for determining "game plan" for the summer. Modify as is necessary.
- Type of treatment for each species should be researched and documented. The State of Utah County Extension agent is a good source for this information. The Internet is also a good source.

4. Monitoring

- Design monitoring program with goals of detecting change in abundance. This can be accomplished with the completion of #1 above (document data). Use clean copies of Exotic Plant Data Forms each year, thereby creating the ability to document changes in size of infestation. Each data form should be recorded on the computerized document on a regular basis.
- Create new monitoring sites of new species and/or new sites i.e. yellow sweet clover near the standard cabins, and effects of fire on thistle species.

SPECIES	# OF SITES TREATED	AREA (SQ METERS)	DENSITY-% COVERAGE
<i>Arctium minus</i> Common burdock	2	75.1	Less than 1%
<i>Bromus tectorum</i> Cheat grass	5	1298	10 to 50%
<i>Cardaria draba</i> whitetop	1	105	5%
<i>Carduus nutans</i> Musk thistle	6	10,553	Less than 1% to 70%
<i>Centaurea repens</i> Russian knapweed	1	42	1%
<i>Cirsium arvense</i> Canada thistle	3	2433	20 to 25%
<i>Cirsium vulgare</i> Bull thistle	17	78,479.3	Less than 1% to 40%
<i>Convolvulus arvensis</i> Field bindweed	7	128	5 to 80%
<i>Cynoglossum officinale</i> Houndstongue	1	12.25	10%
<i>Erodium cicutarium</i> Redstem filaree	1	1	1%
<i>Salsola iberica</i> Russian thistle	5	987	5 to 50%
<i>Tragpgon dubius</i> Western salsify	1	.1	Less than 1%
<i>Verbena bracteata</i> Prostrate vervain	2	71	5 to 35%
<i>Verbascum thapsus</i> Common mullein	7	15,996.1	Less than 1% to 75%
<u>TOTALS</u>	<u>59</u>	<u>110,180.85 m</u> <u>or 11.018</u> <u>hectares*</u>	<u>Less than 1%</u> <u>to 80%</u>

* one hectare=2.477 acres

