

BRCA Vegetation Crew Exotic Plant Control Activities – 2002 Season

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Introduction:

Bryce Canyon National Park has a relatively short history of non-native vegetation control. There has been very little information collected concerning non-native species prior to 1979. Surveys were conducted in park drainages for *Tamarix ramosissima* and *Elaeagnus angustifolia* (Russian Olive), in 1979 (first mention of *T. ramosissima*), 1990, 1991, and 1992, these are both “noxious” plant species that require the use of an herbicide for successful control.

Though surveys were conducted it was not until 1993 that the first formal exotic plant control program in the history of the park was implemented. Early in 1993, the Chief of Resource Management began preparations for an exotic plant control program and implemented the program that summer. The 1993 survey included a “comprehensive extermination program”. In 1994, a follow-up study was performed to determine the success of the 1993 program and to exterminate any surviving plants.

The only non-native plant species that has documented control and eradication prior to 1993 is *Cirsium vulgare* (Bull Thistle). At that time the main population was at the Mixing Circle and Horse Corral area, this population seems to have been successfully eradicated, only to become a larger problem in other areas of the Park. *C. vulgare* has now become one of the main non-native species in the park with large populations along the main Park road and in Swamp Meadow.

General Comments:

At Bryce Canyon, the vegetation crew’s main duties have been non-native vegetation location, documentation, and control, and a small amount of native plant restoration around the new Visitor Center. Resource Management filled two seasonal positions for the year 2002, myself, Joanna Welch, as the Crew Leader, and Dale Kohlmetz as the crew.

For location we used a GPS GeoExplorer3 early in the season to document sites and also placed sites on 7 ½ minute Topographical Maps. For those sites that we were able to GPS I printed a map of the site with UTM coordinates. We used previous data forms to locate earlier known sites, and found where the sites were located on the 7 ½ minute topographical maps. We documented our control efforts on Exotic Plant Data Forms, which date back to the 1998 season, and in Microsoft Access data bases, Weed Observations data base, and Control Actions Taken data base. The control of the non-native vegetation was achieved either by mechanical means (shovels), or chemical (herbicides), means.

Bryce Canyon’s elevation (6900 - > 9100 ft), limits the spread of some non-native vegetation, and because of this and other factors (temperatures), non-native vegetation species do not present a major impact like they do at many other parks. This year, Dale and I were able to locate, document and control all previously known sites by early August. At that time we began inventorying for non-native vegetation in canyons and washes that either had never known to be inventoried or had not been inventoried in several years. We also found many new sites for which new data forms were filled out and filed, and new records were input into the Weed Observations data base.

GPS & ARCVIEW 3.2:

When we first had use of the GPS GeoExplorer3 I set up the data dictionary to collect data on non-native vegetation to either choose a point or to use the polygon feature. Earlier in the Season when visiting a site we collected GPS points and polygons with the GeoExplorer3. Back in the office I downloaded the GPS data into Pathfinder Office 2.51 and then differentially corrected the data. Once I had the data corrected I exported these files and then opened them into a Theme in ArcView 3.2. Later in the Season, Dale used his computer knowledge to piece together map layers for a new project in ArcView 3.2. After that was done, I hand digitized all the known non-native sites in the Park, even if they were extirpated. There is a theme that has all the species we were focusing on, and from this, I made themes for all the individual species of focus. The GPS data sites were also made into one theme and then individual themes for the individual species. Later in the year Fletcher Linton plans to make a theme showing all the canyons and washes that were surveyed and/or treated. This theme will address the negative data that cannot be otherwise noted except in a report such as this.

Microsoft Access Database:

Once again we were able to use Dale's computer knowledge, this time to make this database a fully relational database. This took significant time to make the needed changes and significant time in the editing/correcting of database records. Dale also worked on making that data available to use for attribute tables for our project in ArcView 3.2

Exotics:

Non-native vegetation species controlled 2002

Arctium minus Common burdock
Cardaria draba Whitetop
Carduus nutans Musk thistle
Centaurea repens Russian knapweed
Cirsium arvense Canada thistle
Cirsium vulgare Bull thistle
Convolvulus arvensis Bindweed
Elaeagnus angustifolia Russian olive
Salsola iberica Russian thistle
Tamarix ramosissima Salt cedar
Verbascum thapsus Common mullein

In the 2002 field season, 107 sites were visited and/or treated, and 41 new sites were documented and treated. Approximately 40,000 individual non-native plants were controlled. The 41 newly documented sites added several square acres of non-native vegetation in the Park. The majority of the new sites were small, with either only one plant or a handful (<50) of individuals which provides a good opportunity for control or eradication. Other new sites were large and well established such as: *T. ramosissima* in the East Fork of Cope Canyon, and *S. iberica* in Pasture Wash. Of the previously documented sites the sites that are being resistant to control and eradication are: *C. arvense* at the Sewage Lagoons, *C. vulgare* and *C. arevensis* in Swamp Meadow, *T. ramosissima* in Yellow Creek, Tropic Wash and Cope Canyon, and *S. iberica* at the Mixing Circle, their numbers run in the thousands.

Some sites were visited multiple times, most notable, were *C. vulgare* sites along the Main road of the park (mostly from mile-post 11 though mile-post 17), Swamp Canyon Meadow, and Tropic Wash, which received much effort and time. By September we had already spent ten days in Swamp Canyon controlling *C. vulgare*. In the year 2001, 3,466 individual *C. vulgare* were controlled in ten visits to Swamp Meadow. Unfortunately, seven of those visits came after August 15th when the plants had already

begun to flower and go to seed. This year we controlled 4,758 individual plants of *C. vulgare* by August 27th, so we have greatly reduced the amount of potential seed release, as the overwhelming majority of these were controlled while in the rosette stage.

Management techniques:

At the beginning of the season I spent quite a bit of time planning for the season. To estimate the amount of varieties and amount herbicide we would need for the season, I researched the management techniques for the above species. I then created an Excel Spreadsheet where I used a calibration formula to estimate the amount of herbicide needed for each species, based on previous site numbers and size. For *T. ramosissima* and *E. angustifolia* we used using the cut-stump treatment, for *Centaurea repens*, *C. arvensis* and *C. arvense* we used Glyphosate (RoundupPro) mixed with water, and used 2, 4-D for a second spraying of *C. arvensis*. The *C. draba* also requires Glyphosate but we held up on treating it as the *C. draba* was greatly affected by the drought and was still in the seedling stage by late August.

In 2002 we treated 33 *E. angustifolia* trees with Garlon4 and the cut-stump treatment, cutting the stump as near to the ground as possible. Since we were running out of Garlon4 by the end of September we treated the *E. angustifolia* in Box Canyon with full-strength Glyphosate. We treated or controlled 5,246 *T. ramosissima*, the majority of those being seedlings or 2nd year plants. For the larger than ¼ inch *T. ramosissima* we used the cut-stump treatment and Garlon 4.

Herbicides/Equipment:

At the beginning of the season we had a full 2.5 gallon container of Garlon 4 leftover from 2001, and we purchased a 2.5 gallon container of RoundupPro. Since only 6 *E. angustifolia* trees were treated in 2001, and no *T. ramosissima* were treated, we used almost all of the Garlon 4 by August treating *E. angustifolia* and *T. ramosissima*. Dow Agrosiences communicated that Garlon 4 was more appropriate for our uses as it can be mixed with a basal oil or diesel while Garlon 3A cannot be mixed with either. In previous years they had mixed diesel with Garlon 3A. These containers and the mixture were disposed of as they were over 24 months old and not viable according to Dow.

We used 4-gallon backpack sprayers to treat the *Convolvulus arvensis*, *C. repens*, and *C. arvense*. When using the backpack sprayer we wore a spray vest to protect our clothing from spill-overs. We used a hand-held 1 ½ quart, pressurized sprayer to treat *T. ramosissima* and *E. angustifolia*. We used Nalgene fluoridated wide-mouth bottles to transport the Garlon 4, Glyphosate and 2, 4-D to backcountry areas.

Inventoried and Treated Areas

Box Canyon:

This site is apparently right outside the Park boundary but because it is viewed as a seed source for the noxious species *E. angustifolia* we felt we needed to treat it. In September three members of the Fire Crew helped us by bringing in one of their chainsaws and cutting down all the stems at this site that had mature *E. angustifolia* and numerous younger trees. I applied full-strength Glyphosate to 32 stems ranging from ½” to 8” in diameter, using about one quart of Glyphosate. This is the first time we used Glyphosate on this species and this was done because we were basically out of Garlon4. The research data does suggests using full-strength Glyphosate to treat *E. angustifolia*. This site had been treated before, there were old branches lying around, but there are no known records of this treatment but it must have been some time ago since we had mature trees.

Campbell Creek:

The Campbell Creek watershed was partially surveyed in early August. In the first drainage West of the East Boundary fence line, we found a new site of three mature *T. ramosissima* in this drainage. They all had multiple stems that were about one inch in diameter. Later that day we found another mature *T. ramosissima* near a *S. iberica* site. There were no *S. iberica* found. We treated all the *T. ramosissima* with Garlon 4 and the cut-stem method. In September we went upstream Campbell Wash and found a young population of *T. ramosissima* downstream (beginning about 500 meters downstream) of Tower Bridge. Downstream from the Tower Bridge we treated 15 less than ¼" stems and dug up 26 stems. We also found two *C. vulgare* rosettes in this area. Across from the Bridge or just upstream of the Bridge we treated three more stems of *T. ramosissima* with Garlon 4 and dug up two more stems. We also found a *C. vulgare* in flower in this area, we bagged this plant that had already partially gone to seed.

Cope Canyon:

According to the records in 1990, Cope Canyon had 16 *T. ramosissima* (and only at Box Canyon confluence and NE border with East Cope). No documentation of treatment in Cope Canyon is available before 2000 and Cope Canyon was not visited in 2001. Cope Canyon is one of the several unfenced areas of the park, and because of this, it is the most cow-impacted area in the park. On our first visit to Cope Canyon in late June we saw and heard numerous cows. On that first visit we inventoried and treated *T. ramosissima* and *E. angustifolia* in the West Fork. We treated 10 *E. angustifolia* trees, several large and mature stems (3-5" diameters), with the rest all greater than ½ inch. We also controlled/treated 310 *T. ramosissima*, the majority of these being seedlings. Our second visit was in late July when we inventoried and treated most of the East Fork and the West Fork of East Fork. We treated 498 *T. ramosissima* where most of the stems were from 1-2 meters tall. Several new sites of *T. ramosissima* were documented and treated. At one site we treated 50 stems and at another site we found and treated 333 stems that were totally defoliated as the cows had all but completely eaten the *T. ramosissima*, something I have never seen before. We found one large *T. ramosissima* tree that we treated that had 5 one inch stems and was about 4 meters tall. On that day we ran into more than 25 head of cattle and documented this with a digital camera, along with the devastation done to the native vegetation, numerous cow trails, ATV tracks and a hand-made stock pond. The *T. ramosissima* population has grown significantly in both forks of Cope Canyon since 1990, this may partly have to do with the cattle invasion of the park.

A side wash to the west before the West Fork was inventoried and treated in 1998 and 2000, three trees were found in 1998 and five were treated with Garlon 3A mixed with diesel. In 2000 *E. angustifolia* was also found in this side wash, and two trees were treated with Garlon 3A mixed with diesel. We visited this site in September and found five small stems, two were treated with Garlon 4 and the rest were hand dug.

Cooks Ranch:

The Cooks Ranch site has *A. minus*, *E. angustifolia* and *C. vulgare*. We visited this site several times during the season and treated six *E. angustifolia* trees with Garlon 4 and the cut-stump method. We hand dug 132 *A. minus* and 67 *C. vulgare* rosettes.

Death Hollow:

In late August both the North and South Forks of Death Hollow were inventoried. The Southern Fork had water this year in the drainage most of the way. Because Death Hollow is very steep it is recommended that inventories should be begun from the top of the watershed downstream (Hat Shop area). In the South

Fork three adult *T. ramosissima* were found along with a dozen or so seedlings of *T. ramosissima*, one adult *E. angustifolia* and scattered *S. iberica*. Two adult *T. ramosissima* and one adult *E. angustifolia* were treated in September with Garlon. Because the *T. ramosissima* had rather large multiple stems it took 10-15 minutes to hand cut the stems, and because of this the effectiveness of the Garlon 4 was reduced. The South Fork should be resurveyed and treated next year and then every 2-3 years.

Fairyland Canyon:

In September we surveyed Fairyland Canyon and found it to be totally clean of non-native vegetation.

Highway 63 – Main Park Road:

The main Park Road, Highway 63, has a problem with non-native vegetation due to road work and the heavy equipment associated with this work. The most abundant non-native species found along the roadside is *C. vulgare* where we had 15 sites where we eradicated 1,865 rosettes, bolts, and mature plants. Almost all of the *C. vulgare* were rosettes and 10 days were spent eradicating this species at these sites. Six of the 15 active sites were new sites, mostly with single plants that we discovered as we drove the road. The other two non-native plant species are *S. iberica*, three sites – 50 plants eradicated, and *Convolvulus arvensis*, six sites – 1,524 plants eradicated. In the meadow just North of the South Campground there is a population of *C. repens* (2 small patches), that was first treated in 1996 with Rodeo. This population is still viable and was treated in July with Glyphosate.

Highway 12:

We did not do much work along Highway 12 as it was not viewed as a priority, due to this we missed several *S. iberica* sites. Early on, while in Tropic Wash, I saw a large *E. angustifolia* on the South side of the Highway and up a steep hill. It was not until early August that I viewed it again and we treated it with Garlon 4. It was a rather large tree and was just beginning to set seed, very likely a seed source for Tropic Wash.

Lodge Area:

The Lodge area has previously had rather large populations of *C. arvense* and *V. thapsus*. These two species are now relatively small. This year we treated 9 rosettes of *C. arvense* near Sunrise Unit where we had two new sites, one between Sunrise Unit and the Lodge where we treated 10 rosettes and another in front of the Main Lodge where we treated 1 rosette. All sites were treated with Glyphosate. The *V. thapsus* population has been reduced to locating and eradicating only 6 rosettes between Sunrise Unit and Sunset Unit areas. We had a new site of *S. iberica* with only one plant by the entry road to the Lodge and we pulled it. There has also been a history of *C. vulgare* around the Lodge area and this year we found and dug up 18 plants of *C. vulgare* around a culvert below the stone wall and steps that lead down to the Sunrise Unit from the Lodge, they were in bolt stage.

Maintenance Yard:

There are only minor problems with non-native vegetation in the Maintenance Yard. We have documentation of *C. nutans* and *C. vulgare*. In 1991 seven plants of *C. vulgare* found there and removed, in 1998 74 plants were removed, obviously the population was expanding due to neglect.

Manzanita Dorm:

In 1998 was the first documentation of *C. arvense* at this site. This site was only treated mechanically in 1998 (September), and 2000 (August), and apparently not treated at all in 2001. In the year 2000 they found 50 plants and this year we found 48 plants, some of which were over one foot tall. It is interesting to note that the population did not expand due to this mechanical treatment. We treated them with Glyphosate in July before they had flowered. As with the Sewage Pond population this population also responded well to the Glyphosate by turning completely brown.

Merrill Hollow:

Both drainages of Merrill Hollow were inventoried in late August. They were found to be dry and free of non-native vegetation. Outside of the Park boundary *T. ramosissima* and *S. iberica* were found, and because of this, these drainages should be resurveyed every few years.

Mixing Circle:

The Mixing Circle has one of our biggest populations of *S. iberica*. We found three active sites for this species and dug up 6,272 plants in July. We eradicated the majority of *S. iberica* plants there but did not get the whole population. In the past, starting in 1989, there was a rather large population of *C. vulgare* at the Mixing Circle area. In 1989, the first eradication, 520 plants were removed, in 1990 another 275 plants were removed, in 1991 another 132 plants were removed, then there was no further documentation until 1998. It would seem that this eradication of *C. vulgare* has been successful as the record shows a steady decline in population numbers as long as the population does not get a chance to be re-established. This apparently happened between 1991 and 1998. In 1998 they dug up 434 plants, in 1999 they dug up 209 plants, in 2000 they dug up only 7 plants, in 2001 they dug up 8 plants, and they year, 2002 we found no *C. vulgare*!

Pasture Wash:

Pasture Wash was inventoried in August for the first time since 1994. We found and controlled 181 *S. iberica* in two new sites, a larger site with 175 plants and smaller site with 6 plants. We were able to drive up Pasture Wash until it was about a 10 minute walk to the Park boundary. There is a fence across the Wash.

Riggs Springs:

The Riggs Springs area was visited three times in the year 2002, the first time to inventory and the next two times to control the *V. thapsus* found there. The first time in June we dug up 654 rosettes, most of them rather sickly plants due to the drought. On this day we also GPSed the site with our GeoExplorer3. In July we revisited the site with one volunteer from the Sierra Club and dug up 81 more rosettes, these being in better shape due to the monsoon season. There are three distinct populations at this site, one below the Campsite, one by the Spring and the other just up the trail from the Spring and Campsite.

Sinking Ship Wash:

In September we surveyed Sinking Ship Wash and found it to be free of non-native vegetation.

Swamp Meadow:

Swamp Meadow is one of our most resource intensive sites for non-native plant species as we have a large population of *C. vulgare* there along with a large population of *Convolvulus arvensis*. We first visited Swamp Meadow in May and continued to work there through August. This year we controlled 4,758 individual *C. vulgare* by August 27th, which is significantly more than was controlled in 2001 due to the late in the season control of the *C. vulgare* and it's being able to flower. Next year should see a significant difference as almost all the *C. vulgare* controlled in Swamp Meadow this year were in the rosette stage. We sprayed the *Convolvulus arvensis* with Roundup Pro (Glyphosate) on three days within a week in July. The total number of plants sprayed was 5,495 in the lower meadow, and 48 plants in two small plots at the very West end of the upper meadow. As of the beginning of October we were not able to get back to Swamp Meadow to treat the *C. arvensis* for a second time to use a different treatment of 2, 4-D as planned. This was due to weather as it seems every time we planned to get down there was a day with a 20-40% chance of rain!

Sheep Creek:

Sheep Creek has a minor problem with *C. vulgare*, which might be a result of seeds being deposited from Swamp Meadow. There are three sites near and upstream from the Sheep Creek Campsite, one of them being a new site. Between these three sites we eradicated 117 rosettes and bolts of *C. vulgare*.

Sheep Creek Flat:

In 1998 two populations of *T. ramosissima* were found but apparently not treated until August of 2000, and not treated in 2001. In June of this year we first inventoried the two sites, and then with the help of the Sierra Club Service volunteers we treated 79 trees/clumps of *T. ramosissima*. There were originally 98 trees/clumps found at these two sites that were treated with Garlon 3A but 81% of them re-sprouted. This time we used 100% Garlon 4 and treated each stem/stump within minutes of cutting, so hopefully we will have much better success. I used two quarts of Garlon 4 on those 79 trees/clumps, some of which had large surface areas. This was the first time using the hand-held 1.5 quart sprayer and experienced problems with it from this first use. Unfortunately this sprayer was faulty and unnecessarily dripped a lot of this herbicide. I had 6-8 volunteers cutting the stems and sprouts before I treated with the Garlon 4.

Sewage Lagoon:

The Sewage Lagoons have two non-native vegetation species that are likely a result of the disturbance caused in the construction of these ponds. The most abundant and noxious species there is *C. arvense*, which is found at the third pond. In July and August we sprayed twice with Glyphosate and eradicated 5,608 plants, mostly rosettes, but some bolts. In September we sprayed the remaining new 130 rosettes with 2, 4-D. The other species is *C. vulgare* and is found mostly at the third pond but also at the first and second ponds. In four visits to the pond, May, July & September, we eradicated 110 bolts, plants in bud and flower.

Tropic Wash:

Tropic Wash is another significant site and has a major problem with the noxious weed *T. ramosissima*, and another problem with *S. iberica*. We had three new *T. ramosissima* sites and five confirmed sites. Between those eight sites we eradicated 834 plants, more than half of those being seedlings, except for new seedlings coming up I feel that we have eradicated all other *T. ramosissima* in Tropic Wash. Tropic Wash also has quite a problem with *S. iberica* and we did not nearly eradicate all of this plant from Tropic Wash but did eradicate 1,956 plants.

Yellow Creek:

Yellow Creek has also been affected by cows, but there is a partial fence and the rancher seems to be fairly responsible in driving the cows out of the Park. In the seven times that we have visited Yellow Creek we have not seen a cow, only recent evidence. The devastation is not nearly as bad as was found in Cope Canyon this year.

The 1990 survey documented the *T. ramosissima* in the North Fork of Yellow Creek to be 31 trees, and in the main stem of Yellow Creek, 90 trees. From their map it appears that they only surveyed the North Fork and Yellow Creek to just upstream of the confluence with the North Fork. A survey in 1992 does not give numbers but does give descriptions and UTM coordinates, from these descriptions there would seem to be 30-50 stems. In 1993 the areas surveyed in the North Fork of Yellow Creek and Yellow creek in 1990, were only documented as “treated” but do not supply any numbers of stems. Before 1993 there is no record of any *T. ramosissima* control in Yellow Creek or Bryce Canyon. In 1994 four *T. ramosissima* were treated using Garlon 3A and the cut-stump treatment. No re-sprouting was found from those stems treated in 1993, at that time and the surviving stems that were treated were not treated in 1993 due to their proximity to water. The 1994 survey and treatment went further upstream than previous surveys and treatments (according to the map).

Yellow Creek and Tropic Wash were the significant sites for *T. ramosissima*. While I feel that we got a hold of the problem in Tropic Wash, but Yellow Creek still needs much work. This year we eradicated 2,245 *T. ramosissima* in Yellow Creek, the majority of these being seedlings. There are still thousands of more seedlings to be treated. We never returned to the North Fork of Yellow Creek to treat the few stems we found there, this area should be treated next year.

Yovimpa Pass

In this area we have access to numerous non-native vegetation sites with two of our non-native plant species, *V. thapsus* and *C. vulgare*. At the road and gate to drive down to Yovimpa Pass is a *C. vulgare* site where we eradicated 242 rosettes in June and July. The first site is about ¼ mile down the road on the East side of the road where there are two sites of *V. thapsus* and *C. vulgare*. At the *C. vulgare* site we eradicated 134 rosettes, mostly (119), on the first day with the help of the UVSC volunteers. At the *V. thapsus* site we eradicated 60 rosettes, again with the help of the volunteers on the first time at this site for the year. The second area is up from the parking area at Yovimpa Pass; up the Riggs Loop trail for less than five minutes. This is another combination *C. vulgare* and *V. thapsus* site where we eradicated 237 *V. thapsus* rosettes, and 11 rosettes of *C. vulgare* with the help of the UVSC volunteers. The third site is about a 20-25 minute hike up the Riggs Loop Trail from Yovimpa Pass on the West side of the trail. In June, Dale took a group of the Sierra Club volunteers to this site and eradicated 102 *V. thapsus* rosettes. We later visited this site in August after the Monsoon started and found 18 *V. thapsus* rosettes and three *C. vulgare* rosettes that we eradicated.

Water Canyon:

Water Canyon was inventoried in mid August and *T. ramosissima* was found along with several rosettes of *C. vulgare*. In September we treated 84 stems of *T. ramosissima* with Garlon 4, most of the stems were less than ½” diameter and the largest stem was about 1 ½” diameter. There were also 18 *T. ramosissima* seedlings that were hand pulled. We were able to get all the way up the watershed as the water from the reservoir had been turned off. Just upstream of the fork in the canyon we found two rosettes of *V. thapsus* and scattered *S. iberica*.

Volunteers:

For the year 2002 season we had two volunteer groups, one volunteer for several days and two volunteers for one day each. Our first group was from Utah Valley State College Bookstore at the end of May. With these 25 volunteers we transplanted 34 native plants saved from the reconstruction of the Visitor Center. This has been a great success as more than 90% of the transplanted native plant species have survived and are doing well. Our staff watered them for the first several weeks. In June we had a Sierra Club Service Group who helped us with non-native vegetation eradication for three days. We spent two days at Sheep Creek Flat and Yellow Creek eradicating *T. ramosissima*, 79 trees/clumps at two sites at Sheep Creek Flat, and 1,817 seedlings on Yellow Creek – from near the East border to downstream of the North Fork. In July we had one park visitor who volunteered to work with us. In September we had a volunteer with us for one day, Bettina, who was part of the Sierra Club Service Group back in June.

Recommendations:

1. One of the main problems we have in Resource Management having to do with resource protection is the problem of cattle getting into the park. Cattle have caused significant destruction of native plants in Cope Canyon and some destruction in Yellow Creek. We need to recruit volunteers for fence work, or somehow get a fence crew back in the Park. We need to fence the Cope Canyon boundary in order to stop the devastation being done by cattle to the native vegetation, continue fencing on Sheep Creek Flat to stop cattle from getting in the park. Wilderness Volunteers might just be the right volunteer organization to get this work done.
2. Continue to monitor all of the *T. ramosissima* populations, especially in Tropic Wash, Cope Canyon, Yellow Creek and Sheep Creek Flat.
3. Continue to eradicate all *C. vulgare* on the Main Park Road and Swamp Meadow, especially early in the season while the plants are in the rosette stage.
4. Continue to survey drainages that have no documentation of being surveyed previously, or have not been surveyed for non-native vegetation in several years. Suggested areas to survey are:
Mutton Hollow, Corral Hollow, Horse Hollow, Aqua Canyon, Bridge Canyon, Ponderosa Canyon, Noon Canyon, Mud Canyon, and Bryce Canyon
5. We need to make sure that our chain saw is in working order so that we can cut down any large *T. ramosissima* or *E. angustifolia* that would otherwise be too large or too numerous to cut down with hand saws. Otherwise, work with the Fire Crew and ask for their help in cutting down these large trees.
6. Send a crew member to get chainsaw certified.