

## MEMORANDUM

Subject: Tamarisk and Russian Olive on the Escalante River and side canyons

Bill Wolverton, Escalante Ranger

### Background:

Starting about 1992 the Glen Canyon NRA Escalante Subdistrict rangers began an effort to eradicate Tamarisk from Coyote Gulch. In the spring of 1995 a national Sierra Club service group was utilized to conduct the first organized effort toward this end. In the years since then a variety of group efforts have been made, including Sierra Club, Wilderness Volunteers, the Lake Mead Tamarisk crew, and the Coconino Rural Environmental Corps. By the end of April, 2003, the main part of Coyote had been completed and only one segment of the Dry Fork of Coyote in Glen Canyon, less than a mile long, remained to be cleared of Tamarisk, and the last known Russian Olive in the Coyote watershed was cut. All of the side canyons of Coyote within Glen Canyon, including Hurricane Wash, have also been cleared of both species.

In March of 2000 the scope of the project was extended to the upper reaches of the Coyote drainage on BLM-GSENM along the Hole in the Rock road. The Lake Mead Tamarisk crew spent a week cutting it at Cat Pasture, Orins Well, and Hurricane Wash. This was done in an effort to eliminate the upstream seed source and reduce the likelihood of re-infestation downstream in Glen Canyon. Work remains to be done in a number of places in this area, including Hurricane Wash, Liston Seep, Red Well, upper Peek-a-Boo drainage, and a few others. Unfortunately no follow up work has been done on any of this, and some major re-growth has occurred, especially in Hurricane Wash downstream from the Hole in the Rock road. Virtually everything that was cut there has survived and is growing vigorously.

Follow up work continued in lower Coyote through the 2003 season, mostly on re-growth of previously cut Tamarisk, as well as occasional new starts and old ones that had been missed previously. A few new Russian Olives that have gotten started have been cut as soon as possible after being discovered.

In June, 2001 all Tamarisk was cleared from 40 Mile Gulch from the beginning of surface water flow about a mile below Sooner Wash to the confluence with Willow Gulch. The only exception was a stand in the 40 Mile narrows that was completely surrounded by dense poison ivy. About a half mile of lower Willow Gulch was also cleared at the same time. The one remaining stand of Tamarisk in 40 Mile, which was left because of the poison ivy surrounding it, was cleared in early March, 2002 before the poison ivy had leafed out. Enough of the poison ivy stems could be cleared without the leaves on it to be able to get at the Tamarisk and cut it. This leaves 40 Mile completely free of Tamarisk from the beginning of water flow all the way to the confluence with Willow Gulch. In April, 2003 a Wilderness Volunteers group completed the initial

clearing of Tamarisk in the remainder of lower Willow Gulch. Some remains in the dry upper reaches of the main drainage and a branch of it to the north in the vicinity of the Hole in the Rock road.

This project has also included eradication of Russian Olive where it has been found, but in general the Coyote drainage had only begun to be invaded by it and it had not become a significant problem yet. However, the Escalante River itself has had a steadily increasing population of Russian Olive along the banks for years, and it had progressed the entire length of the river from Escalante all the way to Coyote Gulch, where the Glen Canyon reservoir begins, some 85 miles. It is also found in rapidly increasing numbers in the drainages above Escalante, including Alvey Wash, North Creek, and Main Canyon. It is even present in the upper reaches of Upper Valley along Highway 12. It is seen throughout the town of Boulder. A long time resident of Escalante reported recently that Russian Olive was deliberately planted to control erosion in the late 1940s, and he had been a part of that project when he was in high school. (He was born in 1932) This was clearly a very misguided effort that has since gotten completely out of hand, just as Tamarisk did over 100 years earlier.

I have been aware of the presence of Russian Olive for a number of years now, but only in the last few has it become obvious to me just how fast it is spreading. In the course of routine backcountry patrols in the year 2000, after working elsewhere for 5 years, I really realized just how significant a part of the riparian plant community it has become. I also noticed that it had not gotten too bad in the last section of the Escalante from Fools Canyon to Coyote Gulch, about 8 miles. I had already been working on finishing off the last remaining Tamarisk in Coyote Gulch, and every trip I was prepared to cut some whenever I found it. I extended this effort to cut a few Russian Olives on the Escalante between Stevens Canyon and Coyote Gulch, about 1½ miles, and quickly had it cleared out of that section. Then in September, 2000 I spent a full day (a long day) working on it up river from Stevens Canyon. I was able to clear a full 2 miles of the river that day. The following spring, 2001, I made a trip into Scorpion Gulch, and over the course of two days was able to clear most of it for about ½ mile above and another ½ mile below, except for some that was too big for the saw I had. Also that same spring I made two more trips on the section of the river between Fools Canyon and Stevens. In a total of about 5 working days I was able to clear everything that could be found from a mile above Fools downstream to the point I had reached coming up from Stevens Canyon in September. That left the lower 9 miles of the Escalante free of all the Russian Olive that could be found.

In September, 2001 I led a Wilderness Volunteers group into the river canyon downstream from Scorpion Gulch, making a base camp at Georgies Camp, a side canyon about two river miles downstream from Scorpion. We worked on Russian Olive both upstream and downstream from there, but unfortunately found much more than I had anticipated, including a stand of very large old ones with trunks 10 to 12 inches in diameter. All but two of these were cut with only hand tools, and the two biggest ones were girdled. We were significantly hampered by a lack of adequate sized saws as well as limb loppers. Consequently we were only able to clear about ½ mile upstream and

another  $\frac{3}{4}$  mile downstream. Combined with the work downstream that left over 11 miles of the Escalante River essentially free of Russian Olive, requiring only follow up to maintain it that way. This is roughly 13 percent of the 85 miles of the river from the town of Escalante to the beginning of the Glen Canyon reservoir at Coyote Gulch, and it was accomplished in only a year and a half. The problem was not as bad in much of this 11 miles as it is elsewhere upstream, but this is still an indication of what can be accomplished.

On the trip out with Wilderness Volunteers we hiked the river all the way down to Coyote Gulch, and in the section that I had previously cleared we found some re-growth of what I had cut before, but not excessive. There were also a few that I had missed, mostly in the vicinity of Fools Canyon. The group helped cut all of the re-growth we found in the mile above Fools and some of the ones I had missed near Fools, then they went on downstream to make camp. I continued on downstream from Fools, cutting everything I found, including re-growth, a few that had been missed before, and a few new starts. In one afternoon and the following morning I was able to completely clear everything in 7 miles of the river except for a handful that I had to leave because of falling darkness and the need to go on to a suitable campsite. I came back on another trip and cut those also. The fact that the follow up work could be done on 7 miles of the river in one day by one person suggests that control is feasible, even with an essentially infinite seed source upstream.

In the fall of 2000 and spring of 2001 I also worked with a single volunteer in eradicating Russian Olive from Choprock Canyon, a side canyon which had been invaded just within the last 12 years and where it had become a huge infestation. This project was this individual volunteers idea, and he was the prime mover behind it, as it is one of his favorite places. It took us several days, but we finally got it done, and much of the necessary follow up work has since been done also. This volunteer has continued to do follow up work and has begun working on other Russian Olive, plus Tamarisk, in the immediate area.

Also in the fall of 2000 and spring 2001 I was able to completely eradicate both Tamarisk and Russian Olive from Neon Canyon, an exceptionally beautiful and popular canyon which did not have a major infestation of either. I have also partially cleared Fence Canyon of Russian Olive, which is relatively short and does not have a major problem yet.

In May, 2002 I spent a week with a Wilderness Volunteers group working on the Escalante River above Fools Canyon. In a total of about 3 working days we were able to clear 3.3 miles of the river, averaging 1.1 miles per day. The first day we were able to do almost two miles, where density and size of the trees encountered was not too great. The second day we started finding more and bigger trees which slowed our progress and limited it to only a little under a mile. The third day was still worse, and only about a half mile was done.

We were much better equipped this time, and had enough tools for everyone to have a saw, limb lopper, and sprayer. Saws were a mix of 10" and 13" folding pruning saws, and several 20" non-folding saws. All of them were given a little bit more set for a wider kerf because of the stringy nature of the Russian Olive wood and its tendency to clog the cut. Some of the same sprayers were used from the September, 2001 trip, supplemented with some professional chemical resistant sprayers obtained from the Forestry Supplies catalog.

After finishing we hiked out down the Escalante River to Coyote Gulch. From Fools Canyon on down the river to Stevens I searched diligently for any Russian Olive, and found about 40 to 50 new ones that were mostly too small to have been found last September. I cut all of them over a distance of about 7 miles, from 1100 to 1700. There were only a few instances of re-growth of ones that had been cut previously. This number is significant in two ways. First is the sheer number of new plants which, if left uncut, would be large trees in only a few years, and the second is that they could all be cut easily by one person in one long afternoon, with minimal tools. This shows that control is possible, even downstream of the seed source, but also shows how disastrous the potential is if no control is attempted. In September, 2003 another follow up trip was made through this same section, and this time an actual tally of plants cut was kept. It turned out to be far worse than the previous year, with a total of 236 plants cut, and required about 11 hours to make the trip, which can normally be done in about 4 to 5 hours without doing any work. The plants cut included several old beaver cuts which had started to grow again and had gotten big enough to be found, a few cases of re-growth of previous cuts, and one cluster of three old trees which had been overlooked behind a huge boulder. The majority were new starts.

In September 2002 another Wilderness Volunteers group spent a week continuing the eradication effort up river above Fools Canyon. Unfortunately when we arrived at the river at Fools it was too high to be safely negotiable following a major flood the previous day. It was still high the next morning, and this cost us a day and a half of potential working time. However, I was able to utilize part this time to do some extensive follow up work on the section that had been cleared in May. The river eventually went down enough to get to the beginning of the work, and we were able to put in a full day, in which we were able to clear about a half mile of numerous large trees. Similar progress was made the next day, until a major thunderstorm late in the afternoon brought work to a halt. The river flooded again shortly afterward, preventing any more work that day or the next. Consequently only about a mile was cleared this trip.

The difference between this trip and previous ones was that this time we had a chainsaw to deal with the larger trunks. The procedure used was to have the volunteers go ahead with the hand tools to cut smaller trees and clear around the trunks of the larger ones so that I could follow with the chainsaw and cut them. This worked very well overall, and many trees were encountered that would have required an inordinate amount of time to cut with hand saws. The chainsaw made short easy work of them. It was also used to partially cut up the bigger ones that fell in the river so that they could wash away more

easily without causing major obstructions. The flood that occurred the afternoon of the second working day made short work of washing away everything that had landed in the river.

In late April, 2003, another Wilderness Volunteers trip was able to clear 3 ½ miles of Russian Olive, working upstream from the point where the last group had left off. Initial clearing around the larger trees was completed for all 3 ½ miles, and the chainsaw was used again to cut down the large trees. Unfortunately, problems with the chainsaw prevented finishing the last half mile. At the end of that trip only one half mile of initial clearing remained to be done below Georgies Camp, along with the remaining half mile of large trees.

In September, 2003 Wilderness Volunteers worked again on the river. This time the chainsaw was not available because it had been learned that the authority for its use had applied only to Coyote Gulch, and had not been obtained for its use in that part of the natural zone. Using hand saws we were able to cut most of the remaining large trees, but a few of them were girdled instead as an experiment. We then went on to finish the remaining half mile that had not been worked on yet, then worked on upstream through the area that had been cleared on the first trip in September 2001, doing whatever follow up was needed. When that was done we continued further upstream, eventually reaching Scorpion Gulch, which made a total of 20 miles of the river free of Russian Olive. The trees that had been girdled were checked a few day later, and unfortunately two of them showed no sign of dying and had to be cut down instead. The girdling process has proved to be more effort than simply cutting the trees down, and if it is not done well it cannot be considered to be a reliable means of killing them.

In October 2003 a Sierra Club group worked on Russian Olive starting at Scorpion Gulch. There were only 6 people signed up for the trip, and we were able to clear about 1 ¾ miles, including the largest stand of big trees yet encountered, about two dozen just above Scorpion Gulch. About half of these were cut down and the rest were girdled with a tool made just for that purpose, known as the Ringer. Unfortunately it is not able to cut through the tough, stringy, back of the big trees, and it necessary to make two parallel saw cuts around the tree first and strip the bark away with the saw. The Ringer can then be used to make the girdling cut into the living wood.

As has been noted before on previous trips, none of the Russian Olive trees cut was more than 20 years old, and the vast majority were far less than that. Most of the biggest ones were closer to about 15 years, ranging up to about 8" diameter. This offers compelling evidence of just how fast this plant has invaded the river and how fast it grows.

Observations:

Being involved in this work has made it possible to see firsthand the extent to which both Tamarisk and Russian Olive have invaded the Escalante Canyons, and the differences in

the behavior of the two species. Tamarisk, even though it has been around since some time in the 19<sup>th</sup> century, has not become a dominant species along the river's edge. Willows, Cottonwoods, and many plants I do not know are mostly dominant. Tamarisk is present in many places where conditions have been favorable for it, but it does not appear to be spreading through the native riparian community. I have found many places during the course of the work in Coyote Gulch where it has clearly been present for decades in large old clumps, but with virtually no new plants in the near vicinity. The old plants have been hanging on to life for a long time, but are clearly not thriving, with a large amount of dead branches. Many of these are found under the shade of a well established cottonwood overstory with a healthy understory of other brushy species, with the natives clearly keeping the Tamarisk in check. Large monotypic thickets of Tamarisk are found in the delta areas where certain side canyons enter the Escalante River. Large old stands of it are found in many places away from the river where they somehow got started under the right conditions, but they are not spreading and are only hanging on. I have never found Tamarisk growing up vigorously through well-established native vegetation. What little is found in such places is small and not growing fast. It does not appear to pose any real threat to a well-established native riparian community. It obviously needs an advantage of some sort, such as an open area free of other vegetation and with plenty of sunlight. The mudflats in the upper reaches of the Glen Canyon reservoir provide such a setting and Tamarisk does very well there, although willows, cottonwoods, and box elders can also be found in those places along with the Tamarisk. There are many sections of the river along the reservoir mudflat where willows are by far the dominant species, with the Tamarisk being confined to the area behind the willows. Elsewhere the Tamarisk is dominant. Except for situations such as this the Tamarisk invasion seems to have essentially run its course.

Russian Olive, on the other hand, clearly is not limited by any competition with native vegetation. It is found growing up fast and vigorously in the densest stands of willows and other species along the river's edge. It grows right up through them, towers over them, crowds them out, and eventually displaces them. The only thing that is larger than the Russian Olive are the mature Cottonwoods. They are in no danger of being crowded out and displaced, but as the Russian Olive takes over the rest of the area there will be little, if any, replacement of the old Cottonwoods by new ones because there will be no room for them. The Russian Olive grows extremely fast, reaching heights of 15 to 20 feet in only a few years, and still more eventually. During the course of a Wilderness Volunteers trip in September 2000 in the Dry Fork of Coyote Gulch, one was cut down which measured nearly 11 inches in diameter, and was only 14 years old. Most of them that have been cut along the Escalante River so far are not quite that old, yet they have become a very conspicuous part of the riparian plant community in the short time they have been there. It is clear that their numbers will only continue to increase, and very rapidly.

Given the well demonstrated ability of Russian Olive to get started in dense, healthy, well established native vegetation along the river, and its tremendous growth rate and ability to displace the natives, it is clear that without vigorous intervention it is going to become the dominant plant species along the edges of the Escalante River in only a few years,

displacing the vast majority of the natives. In this respect it is a far greater threat to natural conditions than Tamarisk will ever be. In addition to displacing the natives, it is the only plant species in the riparian corridor that grows out over the river. Willows, cottonwoods, and others grow up but not out, and they leave the river passable except when they fall. In the upper Escalante below highway 12 there are places where the Russian Olive reaching out over the river has made it quite a challenge to float the river in a boat, and this is without even considering the horrible thorns on it. In many places it has created a nearly closed canopy above, which nothing else does.

It is also becoming apparent that Russian Olive may even be able to displace Tamarisk. This is based on what can be seen happening in Alvey/Harris Wash at Ten Mile on the Hole in the Rock road. There, the entire wide wash was until recent years nothing but a vast sea of dense Tamarisk. Today though, Russian Olive is rapidly making its presence obvious among the Tamarisk. It is towering over it throughout the entire area, and it appears to be crowding the Tamarisk quite heavily where it can be seen up close along the road. Since Tamarisk does not do well in shade, and since the Russian Olive grows taller and faster it only seems reasonable to expect that in time the Russian Olive will become the dominant species here.

The one encouraging thing about Russian Olive compared to Tamarisk is that in most cases it is found only in a very narrow strip along the edges of the stream courses, and is apparently spread primarily by flooding. Birds apparently do spread it also, since some is found in places that are obviously not subject to flooding. I cut a small one down right at the edge of the Hole in the Rock not far south of highway 12 in the fall of 2001. If it can grow there, where there is no regular water, it can obviously grow anywhere once it gets started. Also, since it grows so incredibly fast and is silvery gray instead of green it is much easier to find than Tamarisk. These factors make control of it much easier and more urgent than Tamarisk. Small, slow growing Tamarisk seedlings can linger hidden in native vegetation for years without making their presence known, plus their seeds can cover a much wider range, being spread by the wind.

#### Future Plans:

Wilderness Volunteers has committed to doing three trips in the Escalante in Glen Canyon NRA in 2004. Two will continue the work on Russian Olive between Scorpion Gulch and 25 Mile Wash. The third will work on the remaining mile (or less) of Tamarisk in the Dry Fork of Coyote Gulch, and then move to 25 Mile Wash to work on Russian Olive.

In addition to Wilderness Volunteers, a national Sierra Club is leader planning to do another trip in the fall of 2004.

Now that the Escalante River has been cleared of Russian Olive from above Scorpion Gulch to Coyote Gulch, almost 22 miles, we will continue working upstream. It may be possible to clear it all the way up to 25 Mile Wash by the end of the 2004 season if all

goes well. This will make a total of 32 miles of the river cleared, out of a total of 51 miles in Glen Canyon NRA, not counting side canyons. Side canyons in Glen Canyon NRA with significant infestations are 25 Mile Wash and Harris Wash. 25 Mile is not too bad yet, and I cleared a mile of it in September, 2002, in only one day, starting at the Glen Canyon boundary and working downstream. About 5 miles remain to be done, and a Wilderness Volunteers trip is scheduled to work on it in April, 2004. Based on what has already been done and comparing that to what remains, it may be possible for the Wilderness Volunteers group to finish it. It is not known how much there is on BLM land in the 25 Mile drainage, but there is not known to be very much. Several medium sized trees were discovered this past summer in the lower end of the side canyon known as Egypt 3, and these may be the furthest upstream occurrence of it in the 25 Mile drainage. In October I went there with a BLM employee and we cut/girdled these trees as well as another stand of smaller ones farther downstream in 25 Mile. Harris Wash is heavily infested, and in some places is not only a nearly closed canopy over the stream but the branches reaching out at low level impede hiking in the wash. The upper portion of Harris on BLM is heavily infested, all the way up at least into Alvey Wash south of Escalante.

In 12 miles of the Escalante River from Harris Wash down to 25 Mile Wash the infestation is quite severe, and seems to be worse than above Harris, based on casual observations. Of course the problem will be getting continually worse with each passing year.

#### Tools and Procedures:

Until the most recent trip Glen Canyon had been doing Russian Olive eradication work strictly with hand tools, primarily because of the remoteness of the work areas and because we have utilized volunteer labor. Chainsaws had only been used by the Lake Mead Tamarisk crew and by the Coconino Rural Environmental Corps, both of them being paid and trained workers. Neither of these groups have been utilized on the Escalante River to date. Much Russian Olive can be dealt with effectively with hand saws, for diameters up to about 4 inches, although trees up to almost 11 inches have also been cut with hand saws. The best saw we have found so far is a folding, backward cutting pruning saw made by the Fanno Saw Works of Chico, CA, their Number 0, with a 13 inch blade. We have also used some 20 inch non-folding pruning saws, which are excellent for larger trees. Because Russian Olive is a rather stringy, tough wood, which tends to clog the cut, I have given all of these saws a little extra set for a wider kerf. This helps reduce the friction drag in the cut and makes cutting easier. It is easily done in a vise with a hammer and punch.

Limb loppers are an essential item for this work, because most larger Russian Olive trunks cannot be accessed without first clearing away the lower branches. It is nearly impossible in many cases to gain access to cut the trunk because of the stiffness and density of the branches and the long sharp thorns on them, and limb loppers are the most effective tool to clear them away. They are also very useful for cutting smaller trees up to 1 ½ inches in diameter. We have used several different types of loppers, of both the

shearing type and the anvil type. The best so far seems to be the Corona Professional “Coronaglas” Handle Bypass Lopper, item #79083 in the Forestry Suppliers catalog.

I have found it very useful to also have a pair of one hand anvil type clippers for cutting smaller stems and for some clearing of small branches to access larger trunks. However, I have always used my own personal clippers for this work, and we have never provided any to volunteer groups. The biggest problem I have had with them is the ease with which they can be lost in the duff. I have done so many times and spent an inordinate amount of time looking for them.

The best sprayers we have found so far are the “Spraymaster” chemical resistant, hand trigger sprayers made by Delta Industries and obtained from the Forestry Suppliers catalog, item #12340

The chainsaw that was used in September 2002 and April 2003 was a Stihl 019T, with a 12” bar. It is small enough to be packed into the work area in a backpack, although doing so required a separate trip. Toward the end of the April 2003 trip it got to be extremely hard, and eventually almost impossible, to start and keep running. It was packed out after that trip and sent in to be repaired. It was not available for the most recent trip because of the lack of proper authority and also because it had not been repaired.

It has become clear that the best approach to organizing the actual work is for everyone to have a full complement of tools, ie., saw, loppers, and sprayer. In this way everyone can work independently, without having to wait for someone else to finish something, and make the most of everyones time for greatest effectiveness. It is vital that everyone have a sprayer immediately available so that every cut can be treated as soon as it is exposed, and that it be thoroughly wetted and not merely misted. Given the remoteness of the work it is simply not worth taking chances on having the plants survive. It also needs to be emphasized that the cuts must be made as close to the ground as possible. The herbicide (Garlon) supposedly is carried to all parts of the plant, but my observation has been that the higher the cut is made the greater the likelihood of re-growth will be. We also had a case in Choprock Canyon where a large number of roots were exposed by a flood after the plants above the surface had been cut and treated, and virtually all of them were growing again, suggesting that the herbicide had not penetrated to them.

Girdling of larger trees was tried on the September 2003 trip, with mixed results. It proved to be a very laborious process, and those who tried it, including myself, agreed that it was as much or even more effort than simply cutting the trees down. If it is done properly it will kill the tree, but if it is not then the tree will survive. It is not certain just how deep the girdling cut must be, and because of that it is difficult to instruct volunteers on how to do it. Two of the trees that were girdled in September 2003 had obviously survived after several days, while the others were clearly dying. It is also rather difficult to make the girdling cut with a hand saw because of the tough, stringy nature of the Russian Olive bark, and the need to make multiple cuts to take out a series of wedges to expose the cambium layer to treat it with the Garlon. A chainsaw would be much more effective. We have also experimented with a tool known as the Ringer, made specially for

girdling trees. Unfortunately it is unable to cut through the tough stringy Russian Olive bark. Because of this it is necessary to make a pair of parallel saw cuts around the tree first, then strip the bark away with the saw to expose the wood. The Ringer can then easily make an adequate girdling cut through the cambium and into the living wood to kill the tree. We have not yet had a chance to revisit any of the trees on which this has been done though, so the effectiveness of it is not known.

The concentration of the Garlon is also a concern. For some time we had been using a mixture of one part Garlon to three parts penetrating oil. On Tamarisk this seemed to be enough. However, Russian Olive is reported to be harder to kill generally than Tamarisk, and the amount of re-growth of it we have had with this mixture would appear to bear this out. After the Wilderness Volunteers trip in September 2001 we used a ratio of one part Garlon to one of penetrating oil, but beginning with the April 2003 trip we have used a 1:2 ratio.

One thing that most people seemed to agree on was that it would be better to work from a base camp, carrying only a day pack, and return to camp afterward. On the first Wilderness Volunteers trip we planned to carry our full packs with us as we worked, and gradually move camp each day, but given the rate of progress this did not work out.

Thoughts on the BLM-GSENM Russian Olive Situation:

The Russian Olive in the Glen Canyon portion of the Escalante is almost all located where it is not accessible without considerable hiking to get to it. This includes about 51 miles of the main river and 8 miles of Harris Wash. The BLM portion of the river is about 34 miles, but it is accessible from highway 12 at Calf Creek and from the trailhead at the entrance to the canyon below Escalante. There are large areas readily accessible by road in Harris Wash, some in Alvey Wash above Escalante, and a lot in the various drainages of the river upstream from Escalante. There is also some in the upper part of Horse Canyon not far downstream from the Wolverine Loop road. All of these areas could be worked on with chainsaws without having to go to any great trouble to get there. The more remote sections of the river between Escalante and highway 12 and downstream from highway 12 may lend themselves better to hand tools and groups such as Wilderness Volunteers. Side canyons that have a problem will most likely also be more remote and suited to hand tools. These include Boulder Creek and the lower part of Death Hollow, both of which have relatively minor (so far) infestations.

Private Land:

An abundance of Russian Olive is flourishing, and presumably spreading, on private land throughout both Escalante and Boulder and on the Escalante River in the vicinity of the Highway 12 bridge. As long as it remains then there will be seeds washing downstream into the Escalante River canyons and continually re-infesting them. Whether it will ever be possible to do anything about it there is no way of knowing at this time. If it is ever

successfully eradicated from the canyons then perhaps the federal agencies could negotiate with the private landowners in order to eliminate it there to protect the “investment” in the canyons. Perhaps it would be reasonable to offer replacement trees of a species that is not invasive. At least one landowner on the river below North Creek is reportedly trying to eliminate it from his property. One obstacle to private individuals doing so may be the availability of Garlon to the general public.

Conclusion:

Eradicating Russian Olive from the Escalante River canyons is going to be huge job, and is going to take several years. It will not be easy, and constant follow up will be required to maintain control of it. However, it can be done, and the consequence of not doing it is to allow the Escalante and its side canyons to become a nearly continuous monoculture of Russian Olive from one end to the other, with nearly all the native vegetation replaced by the invader.

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