

# “The Devil’s Own”—Tamarisk

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## I. Statement of the Problem

Tamarisk, also known as saltcedar, tamarack, tamarix, and many less mentionable names by those who have hiked through this occupant of stream banks, is considered an aggressive alien plant. The plant is a phreatophyte, a water glutton. Edward Abbey (1977) stated: “Like that other typical desert plant the tumbleweed, tamarisk is not native to the American west. It comes from North Africa, and as is the way with other exotics, has spread like a plague....clogging the desert water courses and driving out the willow.....”

Tamarisk’s ability to colonize riparian areas rapidly, as well as ac-

commodate wide variation in its environment, has led to its being classified as a troublesome weed. Tamarisk has replaced willows and cottonwoods on the riversides of the Virgin River and Kanab Creek, both of which cross the Arizona Strip District of the Bureau of Land Management (BLM). When willows and cottonwoods lost their dominance, if they indeed were dominant or co-dominate, on the Virgin River, is unknown.

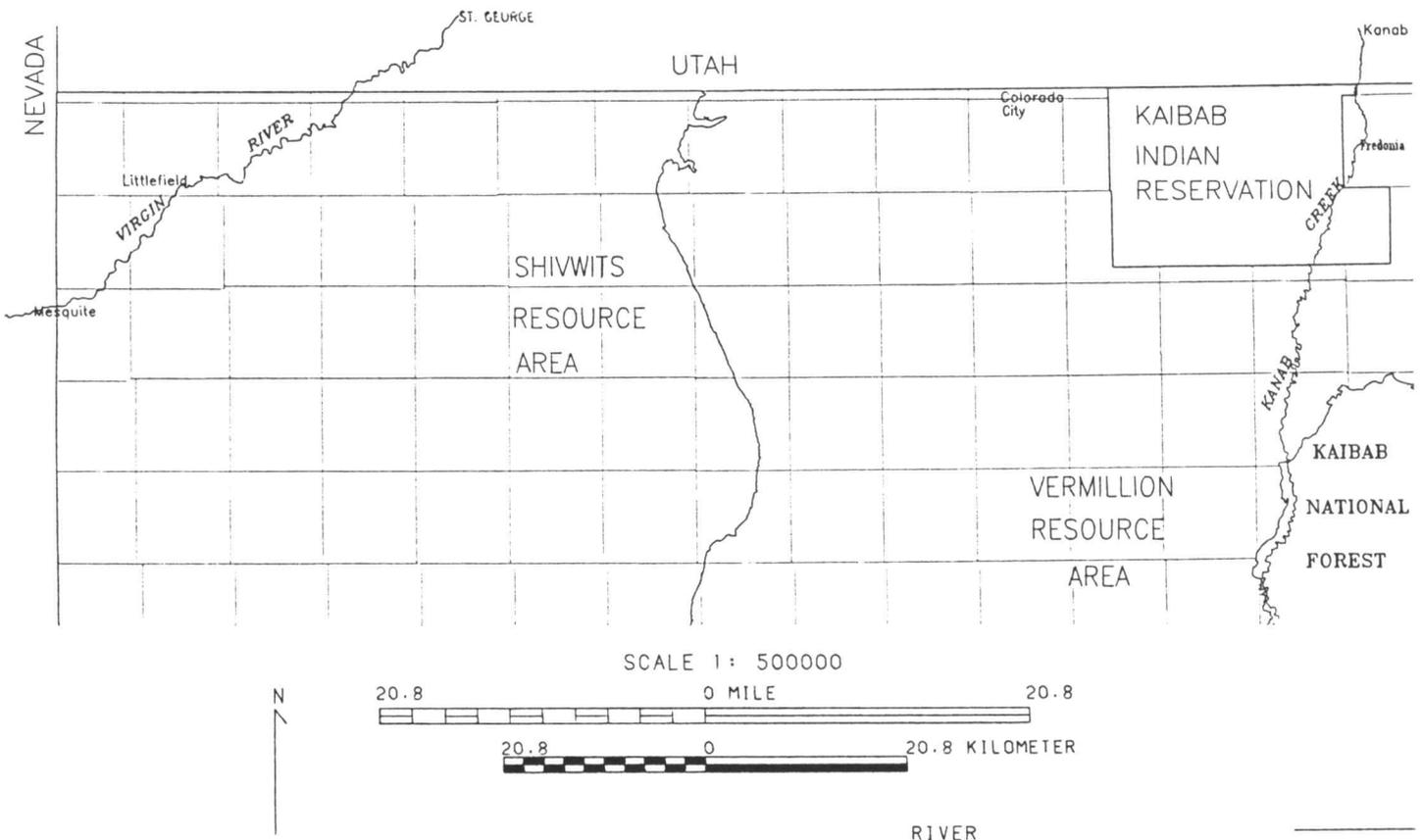
Old photographs, from the early 1900’s, show a very open and broad river (Photo 1 and 2), but also a river with what appears to be cottonwoods and willows on the river banks. But most photos are too blurry to ascertain plant species accurately.

“When I was a boy in the 30’s and 40’s the Virgin River was open, no brush on its banks. Then in the late 40’s and in the 1950’s the tamarisk just seemed to roll down the river,” claimed a resident of Mesquite, Nev. “I don’t think there is anything that can compete with that tamarisk. Cottonwoods just die when they are near,” commented a lifelong resident of Littlefield, Ariz., a small riverside hamlet on the Virgin.

In reviewing the challenges of managing tamarisk, there appear to be no universal solutions. Each infested area has unique problems (Brotherston and Field 1987). In addition to being a formidable problem on the Virgin River and Kanab Creek, tamarisk is also a problem on lesser water-

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*Bunkerville Bridge near Mesquite, Nev.,—1921. Very open and no salt cedar. What appears to be young cottonwood and willow are on the streambank in the foreground.*



*Bulrush Wash-1940. The streambanks are free of any woody growth.*



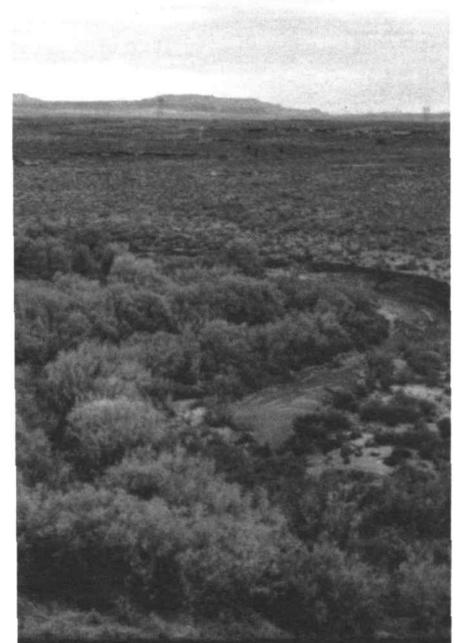
*1992. The same location as above. Tamarisk dominates in a big way.*

ways of the Arizona Strip (Photos 3 and 4).

## **II. Past Failures to Reestablish Cottonwood**

What can be done with habitat dominated by salt cedar? Many claim little can be done to replace tamarisk with native woody or herbaceous plants. In one case on the Arizona Strip District in the early 1980's, 2-3 acres of tamarisk near Beaver Dam Creek on the Virgin River were bulldozed, burned and then the area was planted to cottonwood poles. The

poles were irrigated, no grazing was allowed. In less than 5 years the tamarisk exercised with grace, a "slam dunk" redomination. The cottonwood poles all died. Many guesses as to why the poles died were advanced—soil too salty, the water table dropped below the root zone and the tamarisk choked them out. With these results, the effort died to repopulate the riparian zone with cottonwoods. Dealing with tamarisk seemed hopeless. The



*Bulrush Wash-1991. Tamarisk has plugged the channel. Demonstrates what was said about the Virgin River of how tamarisk plugged waterways.*

thinking from the ground level was, and is, that to reduce tamarisk would require intense repeated chemical/mechanical/fire methods which would cost far beyond the benefits gained by reducing tamarisk stands.

**III. Influence of Grazing on Establishment of Tamarisk**

The Virgin River and Kanab Creek have both long been grazed by livestock. The Virgin River was used by Mexican livestock, as the Spanish Trail (1829–1850) followed the river. Later European settlers moved onto the river. It is possible the river banks have been without cottonwood and willow dominance for a century. The total lack of cottonwoods for long distances 5–15 miles, seems, but does not prove, that the streambanks have been without the cottonwood for a long time.

Kanab Creek has had grazing since the 1860's. Grazing now occurs from October to June on both Kanab Creek and the Virgin River. There are 3 segments on the Virgin River that have been without grazing. A segment is defined as a length of river divided out by geomorphology or by fence lines, resulting in a different livestock management (Table 1). One segment on the Virgin River, number 6, due to geomorphology, has not been grazed, except by beaver and bighorn sheep, since about 1970. The other 2 segments, numbers 8 and 9A, have had grazing excluded

since 1970 and 1988, respectively. These 3 segments afford an opportunity to assess the impact of a few years of rest from grazing on riparian vegetation in a particular locale.

**Inventory**

In 1991–2, the Virgin River and Kanab Creek were inventoried for soils, vegetation, geomorphic, and wildlife resources present. Riparian vegetation was inventoried by measuring dry weight of plant species occurring in a 9.6 square foot hoop which was placed along transects. Transects were done in 3 different zones in accordance to closeness to the stream's edge. The 3 sites run parallel to the waterway. One, the wet zone, is that narrow band of sedges and rushes at the water's edge. The next zone is wider and is called regeneration. This zone has the young woody vegetation. The next zone is the floodplain. This zone has a mix of riparian and upland vegetation and is where adult trees or shrubs occur. Only the wet zone and regeneration zone vegetation will be discussed.

The vegetation data shown in Table 1 are from the plant composition data. Sedges, rushes, cattails, seep

willow, arrowweed, reed grass and coyote willow are native riparian plants. Rabbitfoot grass, cocklebur, barnyard grass, dallisgrass, bermuda grass, clover, and tamarisk are exotic invaders. Of the exotics, the majority is tamarisk and rabbitfoot grass.

**Wet Zone**

The Virgin River wet zone (Table 1) segments two through four are dominated by exotics such as rabbitfoot grass with small amounts of natives such as sedges and cattails. Segment one's wet zone composition has twice the natives as in segments two through four. Segment one is under rotation grazing during the grazing season. Segment five's wet zone is mostly rock. Segment six is dominated by natives with small amount of rabbitfoot grass and other exotics. Livestock have not grazed this segment since about 1970. Segment seven is dominated by natives, mostly cattail. It receives livestock use every spring. Some years it has been rested during the spring when the pasture is not used because of drought or other stressful periods. Segment eight's natives dominant by a large margin. Livestock grazing has been largely absent since the early 1970's. Seg-

**Table 1** Following is a list of the species composition of each segment's plant community. The numbers include all the native riparian vegetation (sedge, willow, reedgrass, arrowweed), and exotic vegetation (rabbitfoot grass, dallisgrass, tamarisk, etc.).

PLANT SPECIES COMPOSITION  
VIRGIN RIVER

ZONE	SPECIES	SEGMENTS									
		1	2	3	4	5	6	7	8	9	9A
WET	NATIVE	31%	15%	14%	11%	0%	82%	82%	83%	25%	99%
	EXOTICS	69%	85%	86%	89%	0%	18%*	18%	17%*	75%	1%*
REGENERATION	NATIVE	7%	7%	0%	1%	10%	48%	12%	25%	28%	86%
	EXOTICS	93%	93%	100%	99%	90%	52%*	88%	75%*	72%	14%
	SEGMENT LENGTH (MILES)	2.5	3.25	1.0	5.0	3.0	2.75	2.25	3.0	9.25	2.5

\*No Grazing

KANAB CREEK

ZONE	SPECIES	SEGMENT 1	SEGMENT 2	SEGMENT 3	SEGMENT 4	SEGMENT 5
REGENERATION	NATIVES	67%	67%	97%	55%	50%
	EXOTICS	33%	33%	3%	45%	50%
	SEGMENT LENGTH	2 MILES	4 MILES	8 MILES	2 MILES	7 MILES



Kanab Creek—1991. Willow dominating on one bank and saltcedar on the other.



Virgin River-Beaver Dam Arizona—1966. Then a more open river. Vegetation is a mix of willows, cottonwoods, and saltcedar.

ment nine has only a small amount of natives with the exotics dominating this segment. Livestock graze this segment in the winter and spring. Segment 9A's wet zone is dominated by native sedge/rushes. This has not had livestock grazing since 1988.

#### Regeneration Zone

The regeneration zone on the Virgin River (Table 1) is, with the exception of segments six and 9A, dominated by tamarisk. Both those segments have been without grazing since 1970 and 1988. However, Segment six is co-dominated by canary reed grass and tamarisk. Segment 9A is dominated by willow.

Segment eight's regeneration zone has been without grazing since 1970, and shows more natives in its composition than segments one through five and about the same as segment nine, which has grazing.

The regeneration zone woody native species composition of Kanab Creek is more diverse (Table 1). In segments three, four, and five there is a dominance or measurable presence of natives, mostly willow (Photo 5). Perhaps, the reason the willow is making a healthier stand against tamarisk in Kanab Creek compared to the Virgin River is that Kanab Creek is about 2,000 feet higher.



1992. Vegetation is thicker with all species. Willow, saltcedar, some cottonwoods, and arrowweed. This is in Segment 8, which has not had grazing since 1970's. But big cottonwoods on the floodplain terrace are gone.

Phenologically the willow has more growth time after the livestock are moved out, as the livestock are in Kanab Creek the same time periods as in the Virgin. The heat and dry weather on the Virgin cause the woody vegetation to slow or stop growing in June, July, and August.

The summer months, however, along Kanab Creek provide time and environment for good regrowth.

#### IV. Conclusion

What is observed from the data and pictures are:

1. That the Virgin River was, in the early decades of this century, a wide sandy bottomed river with some riparian brush along its steambanks.

2. No tamarisk had yet invaded onto its banks; more recent (1966) pictures (Photos 6 and 7) show the domination of the steambank by tamarisk but willow and cottonwood are evident also.

3. Where grazing has been more restricted or stream banks have been rested from grazing, the wet zone native riparian vegetation has responded with redominance.

4. The regeneration zone's woody native vegetation in the Virgin River in all segments appears to have been slower to respond to rest, both short and long term, and remains dominated by tamarisk. Segment six has shown improvement, however. But it's not woody plants but reed grass.

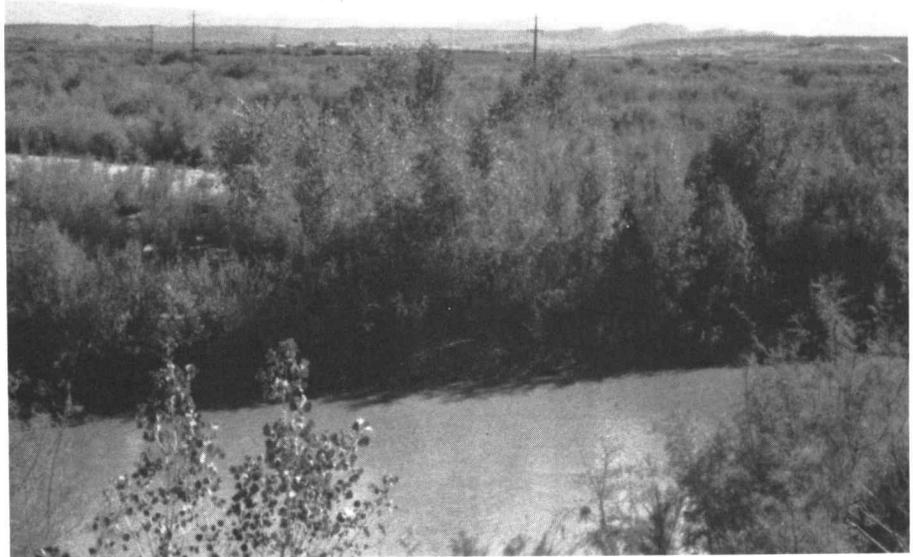
5. Kanab Creek's regeneration zone has shown that woody natives, willows, can compete effectively with tamarisk and in some areas dominate with seasonal grazing.

The best management solution to the tamarisk, is to work with the riparian areas by providing rest from grazing, especially during the spring and summer periods. This would allow a slow return of such native riparian plants as willows, cottonwoods, sedges, rushes, and cattails into the areas now occupied by exotics as tamarisk and rabbitfoot grass (Photos and 8 and 9). In this scenario, tamarisk, however, would remain a dominate, into the future, on the Virgin River and Kanab Creek but, with time, would give way and become a co-dominate in the riparian zone on these two river/creek systems.

#### Literature Cited

**Abbey, Edward. 1977.** The journey home, First Edition. E.P. Dutton, N.Y.

**Brotherson, Jack D., and Dean Field. 1987.** Tamarix: Impacts of a Successful Weed. Rangelands. 9:110-112.



*Cottonwoods overtopping tamarisk on the Virgin River near St. George, Utah. This area has not had grazing for an unknown number of years—probably since the early 1980s.*