United States Department of the Interior
Bureau of Land Management

Environmental Assessment
DOI-BLM-UT-C030-2013-0018-EA

July 2013

Virgin River Arundo Eradication
Environmental Assessment

Location:
Grafton Site: T. 42S., R. 11W., Section 3
Mosquito Cove Site: T. 42S., R. 11W., Section 4
Dalton Wash Site: T. 41S., R. 11W., Section 30
Virgin Falls Park Site: T. 41S., R. 12W., Section 28
Dixie Hot Springs Site: T. 41S., R. 13W., Section 25
Red Cliffs NCA Site: T. 41S., R. 13W., Sections 27, 28, 29, 30
Berry Springs Site: T. 41S., R. 14 W., Section 35
Harrisburg Dome Site: T. 42S., R. 14W., Sections 10, 15
Washington Fields Diversion Site: T. 42S., R. 14W., Section 21
Shinob Kibe Site: T. 42S., R. 15W., Section 24
Lower Virgin River Site: T43S., R 16 W., Sections 20, 21, 22, 27, 28, 29, 30
T43S., R17W., Sections 25, 36

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Virgin River Arundo Eradication
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CHAPTER 1
INTRODUCTION AND NEED FOR THE PROPOSED ACTION

INTRODUCTION

The proposed action includes the removal (hand cutting and herbicide treatment) of existing and potential arundo (*Arundo donax*) plants at 11sites (915 acres) located along the Virgin River in Washington County, Utah. The proposal also includes the removal (hand cutting and herbicide treatment) of existing Russian olive (*Elaeagnus angustifolia*) and tamarisk (*Tamarisk Species*) trees at three sites (170 acres) near Rockville, Utah and Washington, Utah. Removal of these exotic invasive species would improve habitat conditions for woundfin (*Plagopterus argentissimus*, Federally Endangered), Virgin River chub (*Gila seminuda*, Federally Endangered), Southwestern Willow Flycatcher (*Empidonax traillii extimus*, Federally Endangered), Yellow-billed cuckoo (*Coccyzus americanus occidintalis*, Federal Candidate Species), several BLM Sensitive species and other wildlife species along the river**.**

PURPOSE AND NEED FOR THE PROPOSED ACTION

Restoration of Virgin River habitat will help achieve DOI/BLM objectives for listed species stabilization and recovery. BLM's commitment for habitat restoration will meet legal commitments under the ESA through implementation of the Virgin River Fish Recovery Plan (USFWS 1995) and the Virgin Spinedace Conservation Agreement and Strategy (UDNR 2002). The project encompasses the designated critical habitat of woundfin, Virgin River chub (chub), and Southwestern Willow Flycatcher (SWIFL), habitat for Yellow-billed cuckoo (cuckoo), and three BLM Sensitive fish species including the Virgin spinedace (spinedace) a conservation plan species.

These fish have steadily declined in numbers since they were listed as endangered species or placed in conservation status and first monitored. The population declines of the woundfin have been especially sharp, leaving this species on the edge of extinction. Among the environmental factors contributing to the decline of these fish has been the change in channel morphology due to exotic invasive plant species along the Virgin River.

The invasive tamarisk and Russian olive have converted the once braided shallow channel of the Virgin River to a more centralized and deeper channel. The deeper channel has resulted in a loss of important habitat for these fish. Also, the riparian habitat for SWIFL and cuckoos has been altered due to the invasion and establishment of these species. The arundo has just recently moved into the riparian habitat along the Virgin River, and if allowed to get established, could further displace native plant species, and contribute to habitat declines for these special status fish and birds species. A significant public safety issue exists from fire and flooding, if arundo is allowed to spread and get establishment in large stands within the urban corridor of St. George, Santa Clara and Washington Cities. The speedy removal of arundo on BLM lands near these communities could help alleviate this concern of future fires and flooding along this urban corridor.

CONFORMANCE WITH BLM LAND USE PLAN(S)

St. George Field Office, Record of Decision and Resource Management Plan, March 1999
The Project would occur entirely on public lands administered by the St. George Field Office and would conform to all applicable land use decisions contained in the St. George Field Office Record of Decision and Resource Management Plan (BLM 1999). The proposed project is in conformance with several land use decisions which provide for the following: 1) RP-05, provides for monitoring of land use practices effecting riparian resources, 2) RP-06 provides for the control of exotics or undesirable plant species, to achieve desirable plant communities along the Virgin River; 3) FW-24, provides for the restoration of degraded native fish habitat along the Virgin River; and 4) FW-35, provides for the removal of undesirable plants, and the reestablishment of desirable plant species including willow and cottonwood to enhance SWIFL habitat.

RELATIONSHIPS TO STATUTES, REGULATIONS AND OTHER PLANS

This EA is being prepared in accordance with NEPA for projects involving federal lands. As described below, the project is consistent with all Federal laws and regulations. This project is consistent with Rangeland Health Standards and Guidelines, with Native American Trust Resource policies, and with other plans, programs, and policies of affiliated Tribes, other federal agencies, state, and local governments to the extent practical within federal law, regulation, and policy.

Executive Order 11988 requires that agencies take special care when undertaking actions that may affect floodplains, directly or indirectly, by avoiding the disruption of these areas wherever there is a practicable alternative and by minimizing any environmental harm that might be caused by Federal actions. Under this order, activities are not to impact the natural and beneficial values served by floodplains that could in turn impact human safety, health, and welfare. Although the Project would include some activity within the Virgin River 100-year floodplain, none of the actions would have adverse impacts on floodplains, but would be beneficial to floodplains in the proposed treatment sites.

The Migratory Bird Treaty Act governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Executive Order 13186 directs agencies to take certain actions to further implement the Migratory Bird Treaty Act, such as requiring agencies to take reasonable steps that include restoring and enhancing habitat, incorporating migratory bird conservation into planning processes, promoting research and information exchange, providing training and visitor education, and developing partnerships beyond agency boundaries. The USFWS leads the coordination and implementation of this order. Much of the project activities could occur outside the active nesting season for migratory birds, and those activities occurring during the nesting period should have minimal impacts to active migratory bird nests.

Executive Order 11990 requires that executive agencies take special care when undertaking actions that may affect wetlands, directly or indirectly, by avoiding the disruption of these areas wherever there is a practicable alternative and by minimizing any environmental harm that might be caused by Federal actions. There are no project related activities that could lead to dredge and/or fill of wetlands or any other wetland related impacts.

Recovery efforts for the Virgin River fish, and the SWIFL are addressed through the Virgin River Program, which was established in January of 1995 to implement recovery actions, and conserve and protect native species in the Virgin River Basin (UDNR 2002). The Virgin River Program was developed by the Utah Department of Natural Resources, USFWS, BLM, National Park Service (NPS), and Washington County Water Conservancy District (WCWCD) with assistance from

conservation organizations and the Utah Water Research Laboratory (UDNR 2002). These agencies and organizations began working cooperatively in 1995 to develop a program that would promote recovery of imperiled aquatic species and assist in meeting the growing need for water by industrial and municipal water users in the Virgin River Basin. The Virgin River Program coordinates, directs, and funds recovery actions for listed species (chub, woundfin, and SWIFL) (USFWS 2008).

The Virgin River Program also expedites management actions taken to promote conservation of the following State sensitive species: spinedace, flannel-mouth sucker, desert sucker, and southwestern toad (USFWS 1995; UDNR 2002). A number of other committees and programs assist in the management of native fish and SWIFL habitat along the Virgin River. A committee chaired by Washington County, the Lower Virgin River Fuel and Fire Council (including members from federal, and state agencies, and St. George, Washington, and Santa Clara Cities) are completing restoration work along the Virgin and Santa Clara Rivers to reduce potential for fire and flooding. This group is working closely with FWS to ensure protection and enhancement of Virgin River fish, and SWIFL habitat along the Virgin River.

The Virgin River Watershed Management Plan was developed by the WCWCD in cooperation with federal and state agencies, and a variety of local interests. The current plan provides direction to agencies, organizations, and developers and focuses on specific resource issues on a sub-basin level.

CHAPTER 2
DESCRIPTION OF ALTERNATIVES

INTRODUCTION

This EA focuses on the proposed and no action alternatives with the no action alternative considered, and analyzed to provide a baseline for comparison of the impacts of the proposed action. The alternative of removing arundo, Russian olive and tamarisk through mechanical means (ie. brush hog) was considered, but eliminated from detailed analysis because much of the areas within the proposed treatment sites contain interspersed native shrubs and trees, which would be removed through mechanical treatment. This is particularly true in those areas adjacent to the stream at all proposed treatment sites. The issues being carried forward for analysis in this EA address wildlife and habitat in the 11 proposed treatment sites, and are based on the IDT Analysis Record Checklist (see Appendix A). The resource values being carried forward include fish and wildlife and habitat.

This project would be completed for the benefit for fish and wildlife and their habitat in the long-term, and is designed to minimize impacts in the short-term. Therefore, most negative impacts would be minimal or immeasurable. The following resource values are carried forward: floodplain, soils and riparian vegetation (including rangeland health standards), fish and wildlife (including Birds of Conservation Concern), threatened and endangered animals, and vegetation (including invasive species/noxious weeds).

All other resource values were dismissed from detailed analysis in this EA, either because the resource is not present in the proposed treatment sites, or would not be measurably affected by the proposed or no action alternative. The rationale for dismissing resource values is presented through the IDT Analysis Record Checklist in Appendix A.

PROPOSED ACTION

General Description and Background

The proposed action includes the removal of arundo at 4 infestation sites and future removal on 7 potential infestation sites (915 acres) located along the Virgin River in Washington County, Utah. The proposed action also includes the use of herbicides for removal of Russian olive (*Elaeagnus angustifolia*) and tamarisk at Grafton, Mosquito Cove and Shinob Kibe sites. In 2012, an Environmental Assessment (EA) was completed authorizing removal of Russian olive and tamarisk, without the use of herbicides at the Grafton, Mosquito Cove and Shinob Kibe sites. In the spring of 2012, tamarisk was cut and burned at the Shinob Kibe site, and in the spring of this year (2013), Russian olive trees were cut (hand tools) and piles for later burning at the Grafton site. Cutting of Russian olive trees at the Mosquito Cove site should be completed next year (2014).

This EA would authorize the use of herbicides to control regrowth of Russian olive and tamarisk at these sites. Table 1 lists the 11 proposed treatment sites, present sites with arundo, Russian olive and tamarisk and the approximate acres at each site. See Map 1 for a general location of each site along the Virgin River, and Maps 2, 3, 4, and 5 for a specific map showing present sites with arundo infestations. For a detailed map showing Grafton, Mosquito Cove and Shinob Kibe sites, see Virgin River Riparian Treatment EA (DOI-BLM-UT-C030-2010-0006-EA) on file at the St. George Field Office, Bureau of Land Management.

Table 1
Arundo & Russian Olive
Proposed Treatment Sites

Site #	Proposed Treatment Site	Acres	Arundo is Present on Site	Potential Arundo Infestation Site	Widespread Russian Olive and Tamarisk is Present on Site
01	Grafton	45		X	X
02	Mosquito Cove	70		X	X
03	Dalton Wash	5		X	
04	Virgin Falls Park	15		X	
05	Dixie Hot Springs	5		X	
06	Red Cliffs NCA	245	X		
07	Berry Springs	10		X	
08	Harrisburg Dome	20	X		
09	Washington Fields Diversion	5		X	
10	Shinob Kibe	65	X		X
11	Lower Virgin River	430	X		
	Total	**915**			

Map 1
General Location
of Proposed Treatment Sites

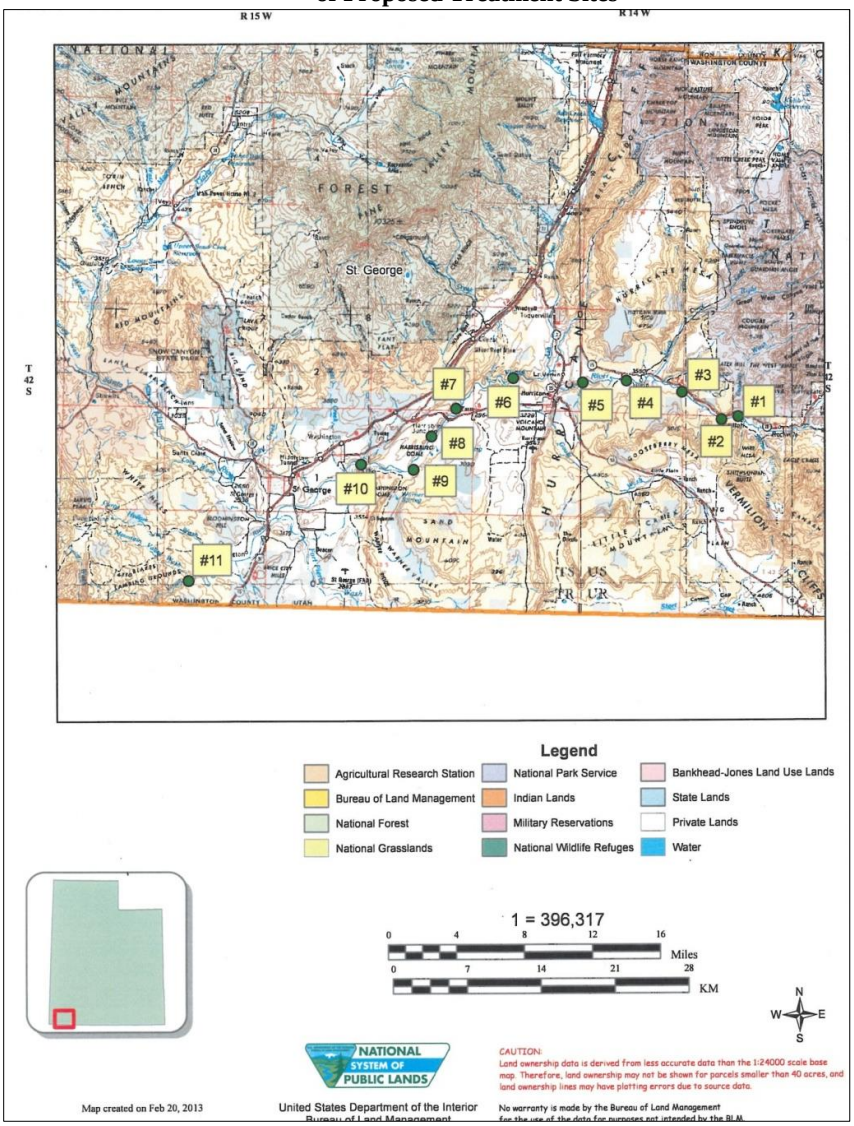


Table 2
Arundo Locations
Red Cliffs Proposed Treatment Site

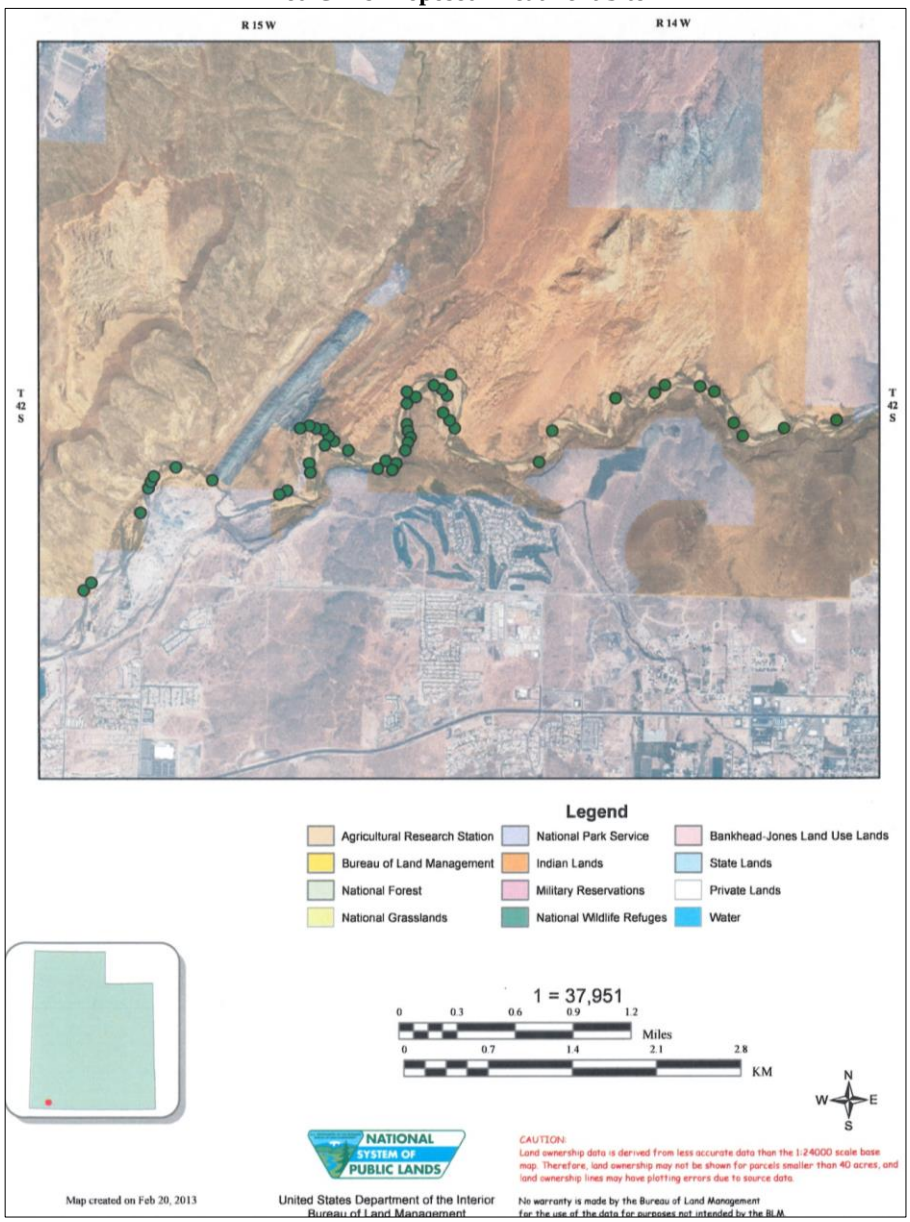


Table 3
Arundo Locations
Harrisburg Dome Proposed Treatment Site

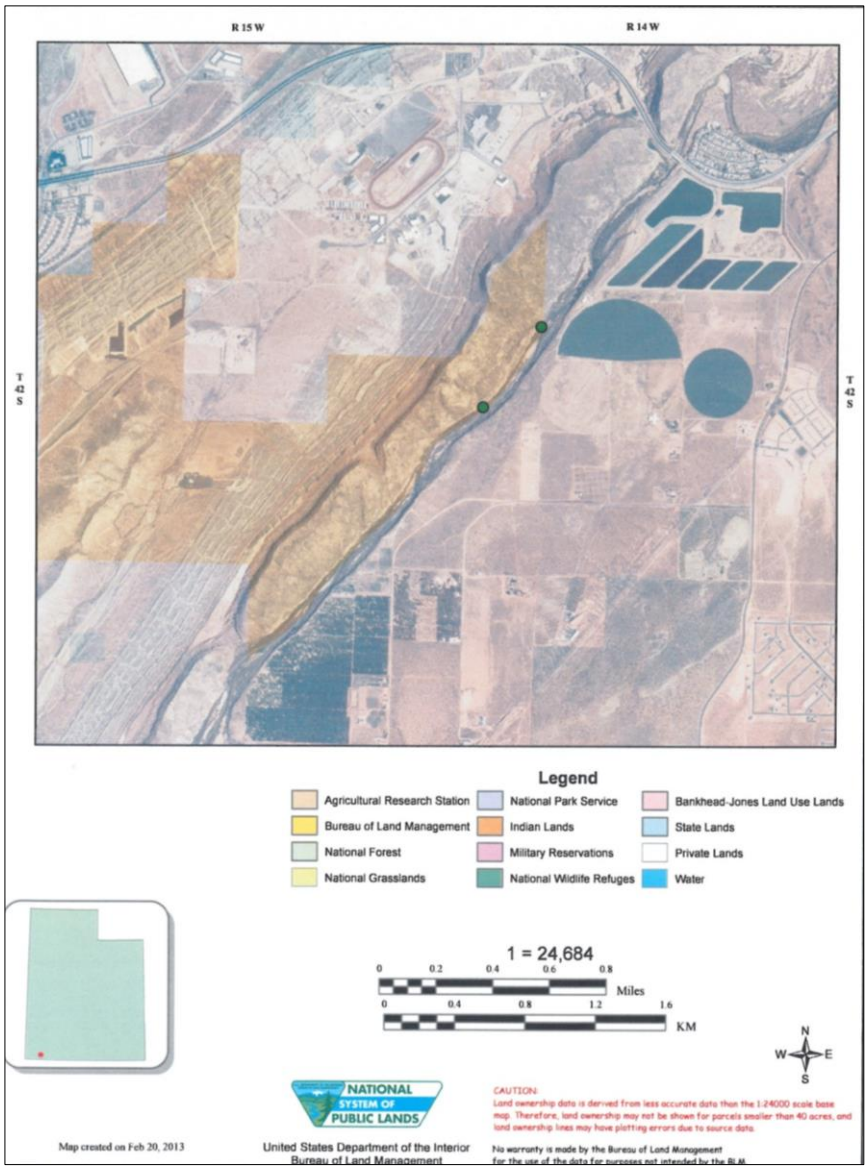


Table 4
Arundo Locations
Shinob Kibe Proposed Treatment Site

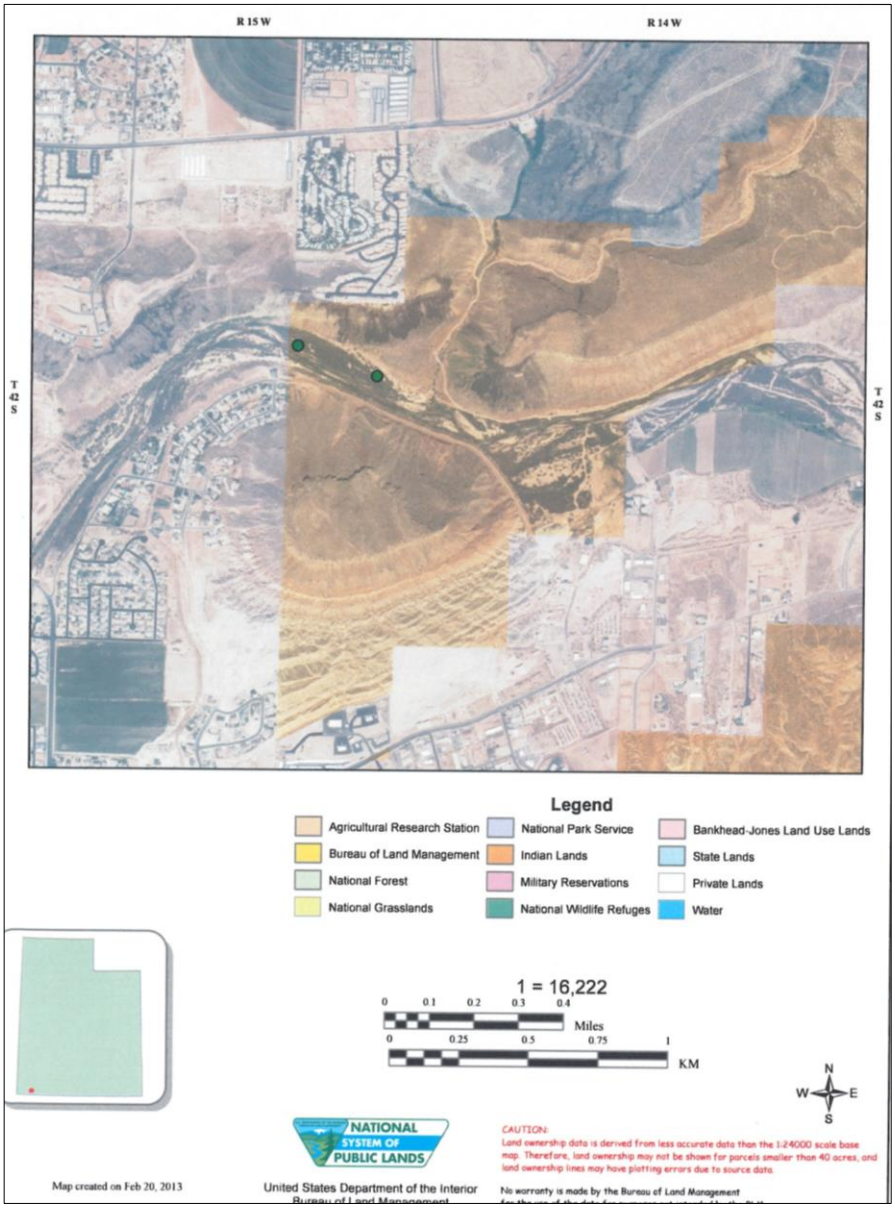
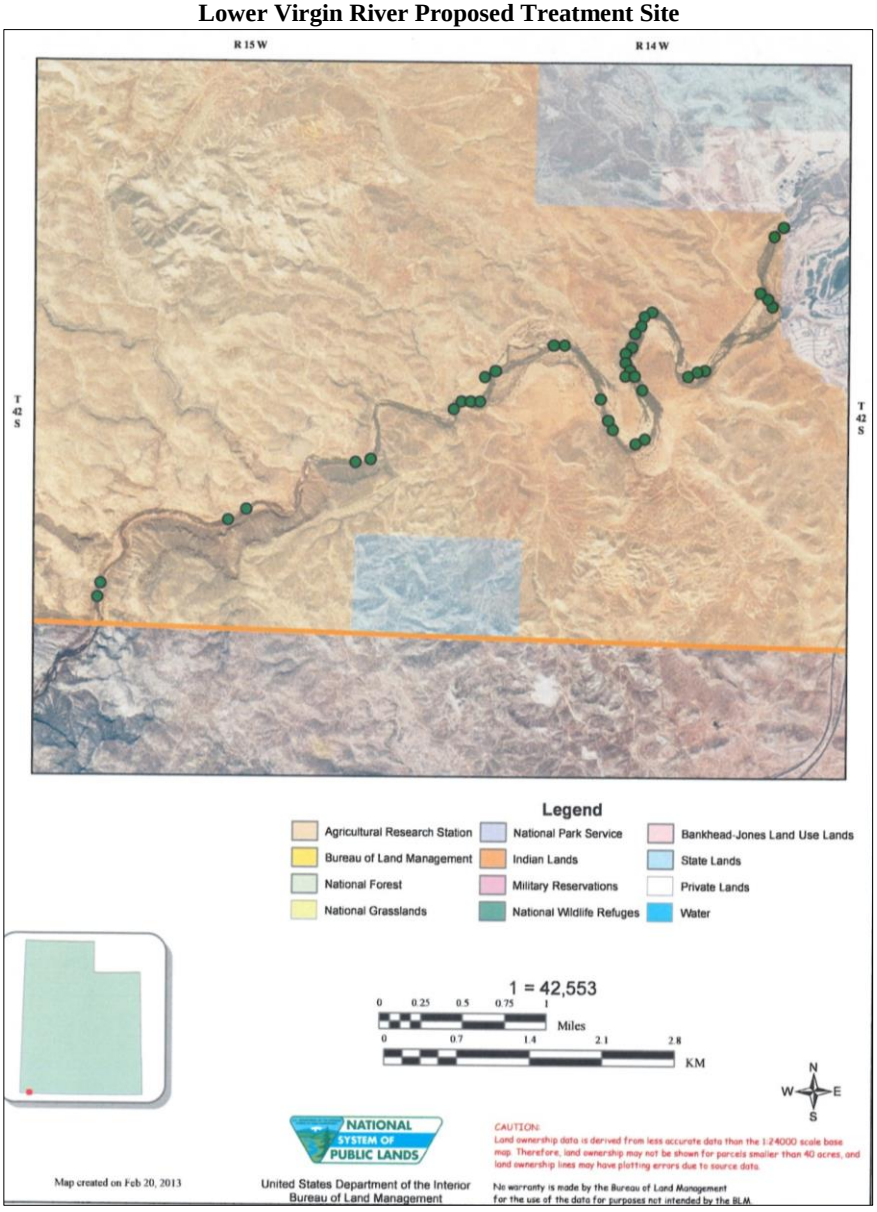


Table 5
Arundo Locations
Lower Virgin River Proposed Treatment Site



The following proposed treatment methods would be used in the eradication of arundo, Russiaolive and tamarisk. Herbicide use under these methods is approved for use by BLM Final Programmatic Environmental Impact Statement, Vegetation Treatments Using Herbicides on Bureau of Land Management Lands In 17 Western States, June 2007 (BLM 2007) (BLM Herbicide Use EIS). Herbicide would be applied by a certified applicator, under the direction of a Pecticide Use Permit (PUP). See Appendix B, Arundo Control PUP, for use of Imazapyr and Glyphosate.

Arundo, Russian Olive and Tamarisk Proposed Treatment

Foliar spray proposed treatment would include the cutting of arundo, Russian olive or tamarisk, waiting for plant re-growth (approximately 1 foot), and foliar spraying new growth. The foliar spray proposed treatment would require a mixture of Imazapyr, Glyphosate and surfactant. The herbicide mixture would be applied by use of a backpack sprayer, or UTV, with tank and wand. The UTV, with tank and wand would be used only in the Shinob Kibe, Grafton and Mosquito Cove sites on Russian olive and tamarisk. In these sites, the UTV would be driven on existing roads, trails and previously disturbed areas; and all fragile areas along the stream (within 100 feet) would be avoided.

Cut stump proposed treatment would include the cutting of arundo, Russian olive or tamarisk and painting herbicide immediately (within a couple of minutes) on freshly cut stumps. The cut stump method will require a mixture of Glyphosate, water and Imazapyr. The herbicide mixture would be applied with spray bottles. All cutting of arundo, would be completed with hand tools only (including chain saws). For a detailed description of how Russian olive and tamarisk would be cut at Grafton, Mosquito Cove and Shinob Kibe sites, see Virgin River Riparian Treatment EA (DOI-BLM-UT-C030-2010-0006-EA) on file at the St. George Field Office, Bureau of Land Management.

Arundo biomass would be removed from the floodplain immediately following proposed treatment to reduce the chance of establishing new populations. The Grafton, Mosquito Cove, Falls Park and Shinob Kibe proposed treatment sites could be accessed by vehicles, so arundo cuttings could be transported to the St. George Re-use facility. On the remaining sites which do not have vehicle access, arundo cuttings would be either hand carried to the nearest vehicle access for disposal, or stockpiled on site (outside the floodplain) and left to decompose naturally. Those arundo cuttings left on site could also be burned at a later date. Prior to the burning of any stock piles of arundo cuttings, a GPS location of each pile to be burned should be given to the BLM, St. George Field Office, archeologist for a clearance prior to burning (see Environmental Protection Measures section below).

Environmental Protection Measures

The following project design features and construction protocols for environmental protection would be in effect during implementation of the Proposed Action.

General Environmental Protection Measures (including Hazardous Materials and Wastes): All workers will be briefed on the sensitive nature of the proposed treatment sites, and the environmental protection measures contained in Appendix 2, Arundo Control PUP, Appendix 3, BLM 2013 Washington County PUP and Appendix 4, Herbicide Treatment Standard Operating Procedures for applying these pesticides (BLM 2007). Crews will minimize surface and native vegetation disturbance in an attempt to avoid and minimize the introduction and spread of noxious, invasive weeds (e.g., whitetop, thistles), however, it may be necessary to mechanically or chemically treat some patches of weeds if BLM or others determine the infestation presents a management problem. The type of treatment, herbicide, application rates, and timing, will depend on the plant species, the

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location of the weeds, and whether the weeds forms a dense monoculture or are intermittently spaced. Herbicide treatment of invasive weeds would be in compliance with BLM 2013 Washington County Pesticide Use Permit (Appendix 3). The filling of gas tanks on chainsaws would be conducted at a minimum of 50 feet from any aquatic habitat to avoid the contamination of the stream

Native Fish: The chub and woundfin occur in the Virgin River at the Red Cliffs, Berry Springs, Harrisburg Dome, Washington Fields Dam, Shinob Kibe, and the Lower Virgin River sites. The flannelmouth sucker (BLM Sensitive Species), desert sucker (BLM Sensitive Species), and spinedace (BLM Sensitive Species) occur in the Virgin River at all sites. During all phases of this project, no vehicle travel would occur within 100 feet of the aquatic, or active stream channel to avoid the take of federally listed and BLM sensitive species.

Native Birds: The SWIFL, cuckoo and several Birds of Conservation Concern (migratory birds) may occur for part of the year at all sites. During all phases of this project, no vehicle travel would occur outside existing roads, previous disturbed areas void of vegetation, proposed treatment areas within 100 feet of aquatic habitats or active stream channels. During the potential nesting period (May 1 to August 31) proposed treatment activities would be limited to minimal vehicle use (transporting of equipment, and materials).

Federally Threatened and Endangered Species: Endangered Species Section 7 Consultation with U. S. Fish and Wildlife Service would be completed prior to any chemical treatment in the proposed treatment sites. In order to avoid damage to desert tortoise (Gopherus agassizii) dens and other habitat found in the Red Cliffs NCA proposed treatment site, any arundo piles to be burned, should be cleared by the Red Cliffs NCA Biologist prior to burning. The location (marked by GPS unit) of each pile to be burned would be obtained for the local BLM Biologist, to assist them in site clearance work prior to burning.

Archeological Clearances Required: In order to avoid damage to archeological sites found along the river, any arundo piles to be burned should prior to burning have an archeological clearance completed. The location (marked by GPS unit) of each pile to be burned would be obtained for the local BLM archeologist, to assist them in site clearance work prior to burning.

NO ACTION

Under this alternative, BLM would not complete riparian treatments, the wildlife habitat, and stream conditions would remain unchanged within the proposed treatment sites.

CHAPTER 3
AFFECTED ENVIRONMENT

Introduction and General Setting

The Virgin River flows over 200 miles from its headwaters near Zion National Park through Utah, Arizona, and Nevada to its present terminus in Lake Mead. The Virgin River is home to six native fish species, including 2 federally listed, and 3 BLM Sensitive species. The climate is typical of the Mojave Desert, with hot summers and cool winters characterized by low precipitation and humidity. Average rainfall is approximately 7 inches per year, the majority of which occurs in later summer and during winter months.

The Virgin River supports a variety of small mammals, birds, reptiles and amphibians which are adapted to the Mojave Desert. Historically, the Virgin River supported a coyote willow, and Fremont cottonwood riparian habitat. However, in recent years, much of the willow and cottonwoods have been replaced by invasive tamarisk which has degraded wildlife habitat along the river. Still, riparian habitat found in Washington County is very important to wildlife, because of the wildlife habitat components it provides. Also, many of these species typically occur in upland habitat adjacent to the river, and utilize the riparian vegetation for a portion of the year. As a result, these species may occur on a transient basis within the proposed treatment sites.

Flood Plain, Soils, and Riparian Vegetation

In general, the Virgin River is a low gradient (0.3 percent) river with a wide channel and a sandy substrate. Similar to other desert rivers, the Virgin River is characterized by large flow fluctuations (0-20,000 cfs), high salinity, temperature, and turbidity (USFWS 2000). Flows are generally highest during the winter and spring months, particularly during spring runoff. Summertime base flows are typically much lower, although large flood events may occur following intense summer thunderstorms. The flow regime of the Virgin River and its tributaries has been modified by developments and diversions designed to capture and deliver water for municipal and agricultural use. As a result, stream flow is reduced relative to natural levels, particularly during summer months. Soils in the proposed treatment sites are fine sands (Fluvaquents) or fine sandy loams (Torrifluvents) as described in the Washington County Soil Survey (NRCS 1977). The permeability is rapid, runoff is slow, and the hazard of erosion is severe. Several areas within the proposed treatment sites have shallow exposed bedrock providing more stability to the flood plain.

Riparian and stream condition varies considerably within each of the proposed treatment sites. Some areas support good stands of native trees and shrubs, while other areas support mixed native and exotic trees (tamarisk). During the floods of 2010, arundo was spread from an infested area near Hurricane to 4 of the 11 proposed treatment sites. The infestation of arundo varies from less than 5 clumps in Harrisburg Dome and Shinob Kibe sites to 80 to 100 clumps in Red Cliffs and Lower Virgin River sites. Presently, each clump is small, generally less than 5 feet in diameter. These present clumps are actively growing, and over time should increase in size.

Within the Grafton, Mosquito Cove and Shinob Kibe proposed treatment sites the once native trees and shrubs have been converted to Russian olive and tamarisk trees resulting in deteriorated vegetation and flood plains. This invasion of Russian olive and tamarisk has lowered vegetative diversity, lowered structural diversity and has caused a lack of overall productivity. The presence of Russian olive and tamarisk trees has also caused the flood plain and channels to become detached vertically, which inhibits proper function of the flood plain, so when moderate to high flow events occur, water and silt are transported quickly downstream, and are not deposited on site. During last year, and the early spring this year, Russian olive and tamarisk trees were cut at the Grafton and Shinob Kibe sites using chain saws. The Russian olive and tamarisk trees at the Mosquito Cove site should be cut next year. The cutting, stacking and burning of Russian olive and tamarisk are covered in the Virgin River Riparian Treatment EA (DOI-BLM-UT-C030-2010-0006-EA) on file at the St. George Field Office.

Wildlife Species including Birds of Conservation Concern

The proposed treatment sites support a variety of small mammals, birds, and reptiles. Wildlife found in the area include: badgers (*Taxidea taxus*), antelope ground squirrels (*Ammospermophilus leucurus*), kangaroo rats (*Dipodomys* species), deer mice (*Peromyscus maniculatus*), desert wood rats (*Neotoma lepida*), Gambel's quail (*Lophortyx gambelii*), mourning doves (*Zenaida macroura*), common ravens (*Corvus corax*), Bewick's wrens (*Thryomanes bewickii*), crissal thrashers (*Toxostoma dorsal*), ruby-crowned kinglets (*Regulus calendula*), yellow warblers (*Dendroica petechia*), blue grosbeaks (*Guiraca caerulea*), desert spiny lizards (*Sceloporus magister*), side-blotched lizards (*Uta stansburiana*), Western whiptails (*Cnemidophorus tigris*), and red-spotted toads (*Bufo punctatus*). Infrequently, larger animals such as raptors, coyotes (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*) and even mule deer (*Odocoileus hemionus*) may pass through the proposed treatment sites.

The U.S. Fish and Wildlife Service (FWS), in compliance with the Fish and Wildlife Conservation Act, published the Birds of Conservation Concern (USFWS 2008), which is a report that identifies migratory and non-migratory bird species that represent the highest need for conservation initiatives. The following Birds of Conservation Concern utilize riparian habitat, and either occur or may occur in the proposed treatment sites: bald eagle (*Haliaeetus leucocephalus*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus*), prairie falcon (*Falco mexicanus*), bell's vireo (*Vireo bellii*), and Lucy's warbler (*Vermivora luciae*).

Habitat condition for wildlife species varies within each of the proposed treatment sites. Some areas support good stands of native trees and shrubs, while other areas support mixed native and exotic trees and shrubs (including Russian olive and tamarisk). Most proposed treatment sites are in fair to good condition and generally support good populations of wildlife, including Birds of Conservation Concern. However, because of the past invasion of Russian olive and tamarisk at the Grafton, Mosquito Cove and Shinob Kibe proposed treatment sites, vegetative composition, vegetative diversity and overall productivity has diminished; causing a deterioration of habitat and lower populations of wildlife including Birds of Conservation Concern.

The spread of arundo along the river has not yet affected wildlife habitat condition; however, if arundo is allowed to spread, wildlife habitat condition (vegetative diversity and structure) may rapidly deteriorate along the river which may result in lower numbers of wildlife including Birds of Conservation Concern.

Federal Threatened, Endangered, and Candidate Species

The USFWS lists 12 wildlife, and plant species as Threatened, Endangered, or Candidate that occur in Washington County, Utah. Of these species, only five either occur within or have the potential to occur within or near the proposed treatment sites: California condor (*Gymnogyps californianus*, Federally Endangered), Mojave desert tortoise (tortoise), SWIFL, cuckoo, chub, and woundfin. Species that do not occur or do not have suitable habitat in or near the project area include: Mexican spotted owl, dwarf bear-poppy, Holmgren milkvetch, Shivwits milkvetch and Siler pincushion cactus. These species will not be considered further in this EA; this proposed project would have "No Effect" on these species

The California condor (condor) was listed as endangered in 1976 (FR 32:48), a nonessential experimental population was established in 1996 (FR 61:201), and a recovery plan was approved that same year. All proposed treatment sites except for Lower Virgin River are within the experimental

population area. Condors require large areas of remote country for nesting, foraging, and roosting. Nesting occurs primarily in chaparral-covered mountains in caves, potholes, and sheltered rock outcrops, while foraging occurs in grasslands. Condors feed only on carrion, mostly of larger animals such as bison, deer, and pronghorn, as well as beached marine animals. Roosting occurs on large, old growth trees or snags, or on isolated rocky outcrops and cliffs (Mesta 1996).

As part of a captive breeding and reintroduction program, condors were released into the wild at the Vermilion Cliffs in northern Arizona near the Grand Canyon (starting in 1996 and as recently as November 8, 2011). From this release site, condors have subsequently been observed in various locations in southern Utah and northwestern Arizona, including in and around Zion National Park. These sightings appear to be transient flights, and the birds appear to eventually return to the Vermilion Cliffs. Marginal habitat is available within the vicinity of the proposed treatment sites, and while condors have the potential to occur within the general area, this species is not known to nest or roost there and would occur only on a transient basis.

Desert tortoises are long-lived herbivores that are active above-ground primarily during the spring, early summer, and fall months. The remainder of the year they spend in burrows, escaping the extreme weather conditions of the desert. The Red Cliffs National Conservation Area (NCA) is at the extreme northeastern edge of the species' range in the area of St. George (USFWS 1993). It is characterized by transitional vegetation represented by sagebrush (Artemisia filifolia), black brush (Coleogyne ramosissima), and Utah juniper (juniperus osteosperma). Here, tortoises live in a complex and rugged topography consisting of rock caves, canyons, mesas, sand dunes, and sandstone outcrops (USFWS 1993).

The Red Cliffs NCA proposed treatment site provides habitat for tortoises. Within this site, tortoises occur outside the flood plain in upland areas located on the south side of the Virgin River. Treatment of the arundo would take place outside tortoise habitat, but stock piling and burning of cuttings may occur within tortoise habitat (see Environmental Protective Measures found in Chapter 2).

The SWIFL was listed as endangered in 1995 (FR 60:10694). A recovery plan was approved and critical habitat designated in 2005 (FR 50:17). The SWIFL, a neotropical migrant, migrates and breeds in the United States and wintering in southern Mexico, Central America, and South America. This flycatcher breeds and nests in relatively dense riparian habitats in all or parts of six southwestern states. Breeding habitats are found along rivers, streams, or other wetlands, where relatively dense stands of trees and shrubs are established near surface water or saturated soils.

The Harrisburg Dome, Washington Fields Dam, Shinob Kibe and Lower Virgin River proposed treatment sites are located within designated critical habitat for SWIFL, and located downstream or upstream from several documented nesting sites for SWIFL (UDWR 2009). The Grafton, Mosquito Cove, Dalton Wash, Virgin Falls, Dixie Hot Springs and Red Cliffs proposed treatment sites are outside the designated critical habitat for SWIFL, have no documented nesting, and are considered by the Virgin River Program as low priority areas.

Habitat condition for SWIFL varies within each of the proposed treatment sites. Some areas support good stands of native trees and shrubs, while other areas support mixed native and exotic trees and shrubs (including Russian olive and tamarisk). Grafton, Mosquito Cove and Shinob Kibe sites are especially degraded due to the invasion of Russian olives and tamarisk and the lack good vegetative diversity and productivity. Those proposed treatment sites found in Critical Habitat, provide the greatest opportunities for SWIFL nesting; however, most proposed treatment sites are in fair to good condition and generally provide some opportunities for SWIFL migration and nesting. The spread of arundo along the river has not yet affected SWIFL habitat condition; however, if arundo is allowed to

spread, SWIFL habitat condition (change in vegetative composition, and vegetative diversity and productivity) could rapidly deteriorate along the river.

Both the chub and the woundfin occur in the river and have designated critical habitat at the Red Cliffs NCA, Berry Springs, Harrisburg Dome, Washington Fields Dam, Shinob Kibe, and Lower Virgin River proposed treatment sites. Further discussions on endangered fish in this EA will be limited to these seven proposed treatment sites. The woundfin was listed as endangered in 1970 (35 FR 16047) and the chub was listed as endangered in 1989 (54 FR 35305). Critical habitat for both these fish was designated in 2000 (65 FR 4140), including approximately 90 miles of the Virgin River and its associated 100-year flood plain, in Utah, Arizona, and Nevada, and a recovery plan was developed for both chub and woundfin in 1995.

The chub is most often associated with deep runs or pool habitats of slow to moderate velocities with large boulders or instream cover, such as root snags. Adults and juveniles are often associated together within these habitats; however, the larger adults are collected most often in the deeper pool habitats within the river. The chub is omnivorous, showing considerable dietary shifts with age. Young fish feed almost entirely on macro invertebrates while adults feed almost exclusively on algae and debris. Chub spawning is known to occur in the spring, during the months of April, May, and June (USFWS 1995). Adult woundfin are often collected from runs and quiet waters adjacent to riffles. Larvae are found in backwaters or slowly moving water along the stream margin, and often are associated with dense growths of filamentous algae. Woundfin feed on a variety of items, including filamentous algae, detrital material, seeds, and aquatic insects; displaying a seasonal shift in food selectivity. Woundfin spawning has been documented from April to August (Hickman 1987; Hardy et al. 1989).

The abundance of fish in the lower river in Utah has remained low in wet years and periodically lost in dryer years (USFWS 2008). This was mainly due to the invasion of red shiner, and the lack of water during the summer month because of the Washington Fields Diversion. In recent years, the construction of a fish screen at the Washington Fields Diversion, removal of red shiner in this reach, and the effort to restore adequate base flow in the river have reduce threats to these fish (USFWS 2008). However, much of the habitat remains in poor condition due to the invasive tamarisk and the conversion of the river from a braided shallow channel to a more centralized and deeper channel. The deeper channel has resulted in a loss of important habitat for adult and young fish, especially during the summer months, and during high flow events.

BLM Sensitive Species

The following BLM State Sensitive Species occur (may occur) within all proposed treatment sites : bald eagle (*Haliaeetus leucocephalus*, winter visitor, uncommon), Ferruginous hawk (*Buteo regalis*, permanent resident, fairly common), Lewis's woodpecker (*Melanerpes lewis*, winter visitor, rare), Long-billed curlew (*Numenius americanus*, transient, fairly common), Northern goshawk (*Accipiter gentilis*, winter visitor, uncommon), Kit fox (*Vulpes macrotis*, permanent resident, uncommon), Spotted bat (*Euderma maculatum*, permanent resident, rare), Townsent's big-eared bat (*Corynorhinus townsendii*, permanent resident, fairly common), Western red bat (*Lasiurus blossevillii*, permanent resident, extremely rare), Arizona toad (*Bufo microscaphus*, permanent resident, fairly common), desert sucker (*Catostomus clarki*, permanent resident fairly common), flannel-mouth sucker (*Catostomus latipinnis*, permanent resident, fairly common), and spinedace (*Lepidomeda mollispinis*, permanent resident, fairly common).

Many of these species may use the proposed treatment sites year-long, while others may use these sites part of the year. Habitat condition for BLM Sensitive species varies within each of the proposed treatment sites. Some areas support good stands of native trees and shrubs, while other areas support mixed native and exotic trees and shrubs (including Russian olive and tamarisk). Most proposed treatment sites are in fair to good condition and generally support good populations of wildlife, including BLM Sensitive species. However, because of the past invasion of Russian olive and tamarisk, and subsequently the change of vegetative composition, vegetative diversity and overall site productivity at Grafton, Mosquito Cove and Shinob Kibe proposed treatment sites, habitat condition has deteriorated, and the site supports lower numbers of BLM Sensitive terrestrial species. The spread of arundo in all sites along the river has not yet affected BLM Sensitive terrestrial species habitat condition; however, if arundo is allowed to spread, habitat condition (vegetative composition, diversity and productivity) could rapidly deteriorate along the river.

The abundance of BLM Sensitive fish in the lower river in Utah has remained low in wet years and periodically lost in dryer years (USFWS 2008). This was mainly due to the invasion of red shiner, and the lack of water during the summer month because of the Washington Fields Diversion. In recent years, the construction of a fish screen at the Washington Fields Diversion, removal of red shiner in this reach, and the effort to restore adequate base flow in the river have reduce threats to these BLM Sensitive fish (USFWS 2008). However, much of the habitat remains in poor condition due to the invasive Russian olive and tamarisk and the conversion of the river from a braided shallow channel to a more centralized and deeper channel. The deeper channel has resulted in a loss of important habitat for adult and young fish, especially during the summer months, and during high flow events.

The spread of arundo along the river has not yet affected aquatic habitat for BLM Sensitive fish species; however, if arundo is allowed to spread, aquatic habitat condition may deteriorate. It's uncertain what effects may occur to aquatic habitat and channel morphology if arundo is allowed to become wide spread along the river.

CHAPTER 4
ENVIRONMENTAL IMPACTS

DIRECT AND INDIRECT IMPACTS

Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

PROPOSED ACTION

This section analyzes the impacts of the proposed action to those potentially impacting resources described in the affected environment section.

Flood Plain, Soils, and Riparian Vegetation

During treatment of arundo, all arundo plants would be removed, leaving proposed treatment areas either void of vegetation, or limiting the vegetation in these areas to native vegetation. Soils would be

more exposed to rain, wind, and river flows in the short-term. This impact would be minimal in nature and immeasurable due to the size of each proposed treatment area (less than 100 square feet). In the long-term, the native vegetative would be maintained and the threat of invasion of arundo would be lessened.

Once treatment of Russian olives and tamarisk at the Grafton, Mosquito Cove and Shinob Kibe sites is completed, the floodplain, soils, and vegetation may be exposed more during high flow events in the short-term, however, the condition should improve in those areas as the native vegetation is allowed to establish. The establishment of native trees and shrubs should also improve the overall condition of the flood plain, and should provide better stream channel and flood plain connectivity.

Wildlife Species including Birds of Conservation Concern

During the proposed treatment work, a few small mammals, birds and reptiles could be killed or disturbed and dens or nests destroyed. This immeasurable short-term impact would not affect general wildlife populations in the area. Larger wildlife species such as mule deer, raptors and coyotes could be temporarily disturbed and displaced to adjacent habitats. After proposed treatment of Russian olives and tamarisk there would be a loss of cover at Grafton, Mosquito Cove and Shinob Kibe sites; which would impact wildlife species in the short-term, but not affecting general populations over the long-term. Over time this loss of cover at Grafton, Mosquito Cove and Shinob Kibe sites would diminish as native vegetation is re-established. General habitat for wildlife (including habitat for birds of conservation concern) should improve substantially once the Grafton, Mosquito Cove and Shinob Kibe sites are restored to native vegetation.

Because the proposed treatment areas are small (less than 100 square feet each), and arundo provides limited benefits to wildlife, the negative impacts from initially removal of arundo should be small and immeasurable. Over time this loss of cover from the removal of arundo would diminish as native vegetation is re-established. Once all of the proposed treatments are completed, and existing arundo plants are killed, the threats of future invasion of arundo into the native vegetation should lessen.

Federal Threatened, Endangered, and Candidate Species

Marginal habitat for California condors is available within the vicinity of the proposed treatment sites, and while California condors have the potential to occur within the general area, this species is not known to nest or roost there and would occur only on a transient basis. No adverse impacts to condors are anticipated as a result of activities within the proposed treatment sites. The proposed treatments "may affect, but not likely to adversely affect" California condors.

The Red Cliffs NCA proposed treatment site provides habitat for tortoises. Within this site, tortoises occur outside the flood plain in upland areas located on the south side of the Virgin River. Treatment of the arundo would take place outside tortoise habitat, so no impacts to tortoises from cutting and treatment of arundo are anticipated. However, the stock piling and burning of cuttings within this proposed treatment site may occur within tortoise habitat. During the proposed treatment, a biological clearance of the area will be made by the local BLM biologist to insure stock piling and burning of piles will not affect tortoise dens or other habitat in this proposed treatment site (see Environmental Protective Measures found in Chapter 2). No adverse impacts to tortoises are anticipated as a result of activities within the proposed treatment sites. The proposed treatments "may affect, but not likely to adversely affect" tortoises.

During treatment of Russian olives, tamarisk and arundo, SWIFLs could be temporarily disturbed and displaced to adjacent habitats. This impact would be greatest in the Harrisburg Dome, Washington Fields Dam, Shinob Kibe and Lower Virgin River proposed treatment sites because these sites are located within designated critical habitat for SWIFL, and in the general area of documented nesting sites for SWIFL (UDWR 2009). In the Grafton, Mosquito Cove, Dalton Wash, Virgin Falls, Dixie Hot Springs and Red Cliffs proposed treatment sites this impact should be less because these sites are outside the designated critical habitat for SWIFL, have no documented nesting, and are considered by the Virgin River Program as low priority areas.

This short-term impact would be minimal and immeasurable not affecting SWIFL nesting or SWIFL populations along the Virgin River because during all phases of this project, no vehicle travel would occur outside existing roads, previous disturbed areas void of vegetation, proposed treatment areas within 100 feet of aquatic habitats or active stream channels. Also, during the potential nesting period (May 1 to August 31) proposed treatment activities would be limited to minimal vehicle use (transporting of equipment, and materials).

After proposed treatment of Russian olives and tamarisk, there would be a loss of cover and opportunities for SWIFL nesting at Grafton, Mosquito Cove and Shinob Kibe sites. Because the Grafton and Mosquito Cove sites are found within low priority SWIFL nesting habitat, with no documented nesting, this impact should be immeasurable to SWIFLs in the short-term. Over time native species should re-establish at Grafton, Mosquito Cove and Shinob Kibe sites and habitat condition at these sites should improve and provide more opportunities for nesting SWIFLs in the long-term. Because the proposed treatment areas are small (less than 100 square feet each), and arundo provides limited benefits to SWIFLs, the negative impacts from initially removal of arundo should be small and immeasurable. Over time this loss of cover from the removal of arundo would diminish as native vegetation is re-established.

Once all of the proposed treatments are completed, and existing arundo plants are killed, the threats of future invasion of arundo into the SWIFL habitat should lessen considerably and habitat along the river should be more stable providing good opportunities for potential nesting SWIFLs. No adverse impacts to SWIFLs are anticipated as a result of activities within the proposed treatment sites. The proposed treatments "may affect, but not likely to adversely affect" SWIFLs.

The spread of arundo along the river has not yet affected aquatic habitat for woundfin and chub; however, if arundo is allowed to spread, aquatic habitat condition may deteriorate. It's uncertain what effects may occur to aquatic habitat and channel morphology if arundo is allowed to become wide spread along the river. The removal of any existing arundo or future arundo infestations should provide for natural establishment of native vegetation along the river, improve overall stream condition and be beneficial for endangered fish in the long-term. No adverse impacts to woundfin and chub are anticipated as a result of activities within the proposed treatment sites. Once the proposed treatment sites are treated, this action along with other actions being implemented through the Virgin River Program should have substantial benefits to endangered fish species. This proposed treatment, "may affect, but not likely to adversely affect" woundfin and chub.

BLM Sensitive Species

During the proposed treatment work, some sensitive terrestrial species could be disturbed and dens or nests destroyed. This immeasurable short-term impact would not affect general populations in the area. Larger terrestrial sensitive species such as raptors and bats could be temporarily disturbed and displaced to adjacent habitats. After proposed treatment of Russian olives and tamarisk, there would

be a loss of cover at Grafton, Mosquito Cove and Shinob Kibe; which would impact terrestrial species in the short-term, but not affecting general populations. Over time this loss of cover would diminish as native vegetation establishes at these sites and the habitat for terrestrial sensitive species should improve substantially once restored to native vegetation. Arundo does not provide good habitat for most of these terrestrial species; also, the size of arundo to be treated is small (less than 100 square feet each), so short-term impacts from the removal of arunto are not anticipated.

If arundo, Russian olive and tamarisk are allowed to propagate and increase along the river, habitat condition for terrestrial sensitive species would probably deteriorate significantly and continue in a downward trend. If the proposed treatments occur, the habitat deterioration should cease and habitat condition should improve or remain stable. No adverse impacts to terrestrial sensitive species are anticipated as a result of activities within the proposed treatment sites; but proposed treatments should provide greater opportunities in the future for these species along the river. No measurable impacts to BLM Sensitive fish are anticipated in the proposed treatment; because during all phases of the project, no vehicle travel would occur within 100 feet of the aquatic or active stream channel (see Environmental Protection Measures in Chapter 2).

In those areas presently invaded by solid stands of Russian olives and tamarisk, the habitat condition for sensitive fish at Grafton, Mosquito Cove and Shinob Kibe sites should improve substantially once restored to native vegetation. This restoration of native trees and shrubs should improve stream channel and flood plain conditions, and improved overall aquatic habitat for sensitive fish.

The spread of arundo along the river has not yet affected aquatic habitat for sensitive fish; however, if arundo is allowed to spread, aquatic habitat condition may deteriorate. It's uncertain what effects may occur to aquatic habitat and channel morphology if arundo is allowed to become wide spread along the river. The removal of any existing arundo or future arundo infestations should provide for natural maintenance of native vegetation along the river, improve overall stream condition and be beneficial for sensitive fish in the long-term. Once the proposed treatment sites are treated, this action along with other actions being implemented through the Virgin River Program should have substantial benefits to sensitive fish species.

NO ACTION

Under the No Action alternative, BLM would not complete riparian treatments, the riparian and aquatic habitat for threatened & endangered species, BLM Sensitive species, general wildlife, and stream conditions in the short-term would remain unchanged within the proposed treatment sites. The Grafton, Mosquito Cove and Shinob Kibe sites would still be treated by use of hand tools only to remove Russian olives and tamarisk (Authorized under Virgin River Riparian Treatment EA, DOI-BLM-UT-C030-2010-0006-EA). The Russian olives and tamarisk at these sites would be more difficult to remove, and would require intense labor and funding.

If proposed treatments to remove arundo are not completed, arundo may spread to all BLM sites and increase and displace native vegetation along the river. It could also affect adjacent private lands along the river, where efforts are already under way to control arundo. Presently, all arundo sites located on private lands have been treated twice for eradication purposes.

It's uncertain what affects may occur to the resource values along the river if arundo is allowed to spread and become dominant over native vegetation. Several streams in California have been invaded with solid stands of arundo affecting resource values along those rivers and increasing the potential for flooding and fire. Here in Washington County, significant impacts to threatened and endangered

species, BLM Sensitive species, general wildlife and riparian/stream conditions along the Virgin River may occur if arundo is allowed to increase.

CUMULATIVE IMPACTS

Flood Plain, Soils and Riparian Vegetation

Cumulative Impact Area and Past and Present Actions: The cumulative impact area includes the Virgin River and its 100 year floodplain and extends from Zion National Park downstream to the Utah Stateline. Primary past and present actions along the Virgin River include: rural and urban development, municipal and agricultural water diversions, channel alteration (flood control), agricultural encroachment, recreation activities including confined (trails and parks) and unconfined, exotic fish eradication (rotenone treatment) and biological control of invasive riparian species (cutting and herbicide treatment on tamarisk and Russian olive).

Reasonable Foreseeable Future Actions: Given the size of the cumulative impact area and the variation in land ownership, the reasonably foreseeable future actions are varied. All the actions described above are expected to continue into the reasonably foreseeable future. Specifically, as a result of the December 2010 floods, there are multiple projects planned that will impact the Virgin River channel through the placement of additional riprap, dredging of the channel, etc. Activities such as water diversions, urban development, and channel alteration are leading to habitat losses for terrestrial and aquatic species. These impacts are expected to continue, given population growth in the Action area.

The Virgin River passes through a number of communities here in Washington County adversely affected by fire and flooding in the past. These communities are expending funds for river improvements aimed at mitigating exotic species related fire and flooding damage, and are presently working with state and federal agencies under the Virgin River Program, and Lower Virgin River Fuel and Fire Council to coordinate efforts along the river. These present, and future efforts of the communities, other state and federal agencies here in Washington County, combined with those actions proposed in this EA should make substantial improvements to the stream and floodplain condition, and ultimately improve aquatic and riparian habitat conditions along the river.

Cumulative Effects: When combined with the level of past, present, and reasonable foreseeable actions, the cumulative impact of the proposed action negligible. The arundo has not been established long enough to significantly impact the area, and the proposed action would serve to prevent change to the environment, rather than causing change. In addition, the area has already been impacted (as described in Chapter 3), so any negative impacts would be inconsequential in relation to existing impacts.

The no action alternative would allow arundo to survive and thrive. The would result in a moderate long term addition to the existing impacts described in Chapter 3, as the arundo adds to the bank stabilizing properties of the existing salt cedar, displacement of native vegetation and further degradation the riparian corridor.

Wildlife Species including Birds of Conservation Concern

Cumulative Impact Area and Past and Present Actions: The cumulative impact area includes the Virgin River and its 100 year floodplain and extends from Zion National Park downstream to the Utah Stateline. Primary past and present actions along the Virgin River include: rural and urban development, municipal and agricultural water diversions, channel alteration (flood control), agricultural encroachment, recreation activities including confined (trails and parks) and unconfined, exotic fish eradication (rotenone treatment) and biological control of invasive riparian species (cutting and herbicide treatment on tamarisk and Russian olive).

Reasonable Foreseeable Future Actions: Given the size of the cumulative impact area and the variation in land ownership, the reasonably foreseeable future actions are varied. All the actions described above are expected to continue into the reasonably foreseeable future. Specifically, as a result of the December 2010 floods, there are multiple projects planned that will impact the Virgin River channel through the placement of additional riprap, dredging of the channel, etc. Activities such as water diversions, urban development, and channel alteration are leading to habitat losses for terrestrial and aquatic species. These impacts are expected to continue, given population growth in the Action Area.

The Virgin River communities are expending funds for river improvements aimed at mitigating exotic species related fire and flooding damage, and are presently working with state and federal agencies under the Virgin River Program, and Lower Virgin River Fuel and Fire Council to coordinate efforts along the river. These present, and future efforts of the communities, other state and federal agencies here in Washington County, combined with those actions proposed in this EA should make substantial improvements to the stream and floodplain condition, and ultimately improve aquatic and riparian habitat conditions for the many fish and wildlife species occurring along the river.

Cumulative Impacts: When combined with the level of past, present, and reasonable foreseeable actions, the impact of the proposed action would negligible.

The no action alternative would allow arundo to survive and thrive. The would result in a moderate long term addition to the existing impacts described in Chapter 3, as the arundo adds to impact of the existing salt cedar, altering wildlife habitat and further degrading the riparian corridor.

Federal Threatened, Endangered, and Candidate Species

Cumulative Impact Area and Past and Present Actions: The cumulative impact area includes the Virgin River and its 100 year floodplain and extends from Zion National Park downstream to the Utah Stateline. Primary past and present actions along the Virgin River include: rural and urban development, municipal and agricultural water diversions, channel alteration (flood control), agricultural encroachment, recreation activities including confined (trails and parks) and unconfined, exotic fish eradication (rotenone treatment) and biological control of invasive riparian species (cutting and herbicide treatment on tamarisk and Russian olive).

The Virgin River communities are expending funds for river improvements aimed at mitigating exotic species related fire and flooding damage, and are presently working with state and federal agencies under the Virgin River Program, and Lower Virgin River Fuel and Fire Council to coordinate efforts along the river. These present, and future efforts of the communities, other state and federal agencies here in Washington County, combined with those actions proposed in this EA should make substantial improvements to the stream and floodplain condition, and ultimately improve aquatic and riparian habitat conditions for the many Threatened, Endangered and Candidate wildlife species occurring along the river.

Reasonable Foreseeable Future Actions: Given the size of the cumulative impact area and the variation in land ownership, the reasonably foreseeable future actions are varied. All the actions described above are expected to continue into the reasonably foreseeable future. Specifically, as a result of the December 2010 floods, there are multiple projects planned that will impact the Virgin River channel through the placement of additional riprap, dredging of the channel, etc. Activities such as water diversions, urban development, and channel alteration are leading to habitat losses for terrestrial and aquatic species. These impacts are expected to continue, given population growth in the Action Area.

Cumulative Effects: When combined with the level of past, present, and reasonable foreseeable actions, the proposed action would negligibly contribute to existing negative impacts to the Virgin River and its threatened, endangered and candidate wildlife. However, the negative impacts of this action would be short term and would be offset by long term benefit of not having arundo in the area.

Implementation of the no action alternative would accelerate the tamarisk and slat cedar driven trend that has converted the once braided shallow channel of the Virgin River to a more centralized and deeper channel. The deeper channel has resulted in a loss of important habitat for Virgin River chub, woundfin, Southwestern willow flycatchers and other wildlife along the river. The arundo has just recently moved into the riparian habitat along the Virgin River, and if allowed to get established, could further displace native plant species, and contribute to habitat declines for these threatened and endangered species.

BLM Sensitive Species

Cumulative Impact Area and Past and Present Actions: The cumulative impact area includes the Virgin River and its 100 year floodplain and extends from Zion National Park downstream to the Utah Stateline. Primary past and present actions along the Virgin River include: rural and urban development, municipal and agricultural water diversions, channel alteration (flood control), agricultural encroachment, recreation activities including confined (trails and parks) and unconfined, exotic fish eradication (rotenone treatment) and biological control of invasive riparian species (cutting and herbicide treatment on tamarisk and Russian olive).

Reasonable Foreseeable Future Actions: Given the size of the cumulative impact area and the variation in land ownership, the reasonably foreseeable future actions are varied. All the actions described above are expected to continue into the reasonably foreseeable future. Specifically, as a result of the December 2010 floods, there are multiple projects planned that will impact the Virgin River channel through the placement of additional riprap, dredging of the channel, etc. Activities such as water diversions, urban development, and channel alteration are leading to habitat losses for terrestrial and aquatic species. These impacts are expected to continue, given population growth in the Action Area.

The Virgin River communities are expending funds for river improvements aimed at mitigating exotic species related fire and flooding damage, and are presently working with state and federal agencies under the Virgin River Program, and Lower Virgin River Fuel and Fire Council to coordinate efforts along the river. These present, and future efforts of the communities, other state and federal agencies here in Washington County, combined with those actions proposed in this EA should make substantial improvements to the stream and floodplain condition, and ultimately improve aquatic and riparian habitat conditions for the many sensitive species occurring along the river.

Cumulative Effects: When combined with the level of past, ~~present,~~present and reasonable foreseeable actions, the proposed action would negligibly contribute to existing negative impacts to the Virgin River and the BLM sensitive species present. However, the negative impacts of this action would be short term and would be offset by long term benefit of not having arundo in the area.

Implementation of the no action alternative would accelerate the tamarisk and slat cedar driven trend that has converted the once braided shallow channel of the Virgin River to a more centralized and deeper channel. The deeper channel has resulted in a loss of important habitat for Virgin spinedace, desert sucker and other sensitive species along the river. The arundo has just recently moved into the riparian habitat along the Virgin River, and if allowed to get established, could further displace native plant species, and contribute to habitat declines for these rare species.

CHAPTER 5
PERSONS, GROUPS, AND AGENCIES CONSULTED

During preparation of the EA, the public was notified of the proposed action by posting on the Utah Internet Homepage on March 28, 2013. No one has contacted the BLM in response to the notice, and no interest was expressed in the proposal, so a public comment period was not offered.

Table *5*.1. List of Persons, Agencies and Organizations Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Corey Cram, Washington County Water Conservancy District, St. George, Utah	Coordination through the Virgin River Program, SWIFL, and Fish TACs	The proposed project would meet the common goal of the Virgin River Program, and endangered species recovery.
Elaine York, The Nature Conservancy, Salt Lake City, Utah	Virgin River Program partner, and coordination for potential funding	The proposed project would meet the common goal of the Virgin River Program and the coordinated efforts in the Grafton and Mosquito Cove areas.
Keith Day, Utah Division of Wildlife Resources, Cedar City, Utah	Coordination through the Virgin River Program, SWIFL Technical Advisory Committee	The proposed project would meet the common goal of the program, and UDWR.
Mike Shaw, Washington City, Washington City, Utah	Coordination with the City of Washington, and Lower Virgin River Fuel and Fire Council	The proposed project would meet the common goals of the Lower Virgin River Fuel/Fire Council, and Washington City.
Patricia McQueary, Army Corps of Engineers, St. George, Utah	The project would not require a permit from the Corps under authority of Section 404 of the Clean Water Act (33 USC 1251)	Coordinated with the Army Corps of Engineers, and it was determined the project did not require any permit.
Paul Abate, U.S. Fish and Wildlife Service, Salt Lake City, Utah	Consultation under the Endangered Species Act (16 USC 1531)	The proposed project would meet the common goal of the recovery plan. Informal consultation was completed.
Steve Meismer, Virgin River Program, Program	Coordination through the Virgin River Program, SWIFL,	The proposed project would meet the common goal of the Virgin River

Coordinator, St. George, Utah	and Fish Technical Advisory Committees	Program, and endangered species recovery.
Rick Rosenberg, Santa Clara City, Santa Clara, Utah	Coordination with the City of Santa Clara, and Lower Virgin River Fuel and Fire Council	The proposed project would meet the common goals of the Lower Virgin River Fuel/Fire Council, and Santa Clara City.
Rick Fridell, Utah Division of Wildlife Resources, Hurricane, Utah	Coordination through the Virgin River Program, SWIFL, and Fish Technical Advisory Committees	The proposed project would meet the common goal of the Virgin River Program, and endangered species recovery.

List of Preparers

The BLM staff specialists who determined the affected resources for this document are listed in Appendix A. Those who contributed further analysis in the body of the EA are listed below.

Table 5.2. List of Preparers

BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Robert Douglas	Wildlife Biologist	Proposed Action, and Preliminary EA
Tim Croissant	Environmental Coordinator	EA Technical Review for Compliance Adequacy

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Appendix A

INTERDISCIPLINARY TEAM CHECKLIST

Project Title: Arundo, Removal, Virgin River

NEPA Log Number: DOI-BLM-UT-C030-2013-0001-BLM

File/Serial Number:

Project Leader: Bob Douglas

Project Description:

General Description: The Proposed Action would remove invasive arundo (Arundo donax) from seven reaches of BLM lands (approximately 750 acres) along the Virgin River through "cut-stump and foliar spray" method. The following riparian reaches could be treated: Grafton, Mosquito Cove, Falls Park, Red Cliffs NCA, Below Hurricane Bridge, Shinob Kibe, and Lower Virgin River (See Map__ for a location of treatments reaches). Vehicle access to reaches would be restricted to existing roads and trails.

Treatment Methods: Two treatments could be administered via "cut-stump and foliar spray" methods depending on size and accessibility of populations. Option 1) cut arundo and wait for 1 foot of re-sprout. Foliar spray new growth. Option 2) Cut arundo and paint herbicide on stump within first couple minutes of cutting. Cut stump herbicide application will require the use of 1:1 ratio of Aquaneat (Glyphosate) with water and an addition of 10 oz. of Polaris (Imazapyr) per gallon. Herbicide will be applied with spray bottles. Both of these herbicides are approved by the BLM. Foliar herbicide application will require a mixture of 1% Imazapyr with 5% glyphosate and 0.5% surfactant. This will be applied via backpack sprayer.

Disposing of Cuttings: Cuttings would be removed immediately from the floodplain, to reduce the chance of re-establishing new populations. Depending on location and accessibility, piles would be Option 1) burned, Option 2) transported to the St. George City Re-use facility, or Option 3) piled and left in place in upland areas. The Grafton, Mosquito Cove, Falls Park and Shinob Kibe treatment reaches could be accessed by vehicles, so piled cuttings of arundo could be either burned or transported to the St. George Re-use facility. While the Red Cliffs NCA, Below Hurricane Bridge, and Lower Virgin River reaches would all need to be accessed on foot, and cuttings would be piled and left in place in upland areas.

Environmental Protective Measures: All workers would be briefed on the sensitive nature of the restoration sites, and the protective measures contained in this environmental assessment. A section 7 Consultation with U.S. Fish and Wildlife Service would be completed prior to any chemical treatment in the project areas.

DETERMINATION OF STAFF: ***(Choose one of the following abbreviated options for the left column)***

NP = not present in the area impacted by the proposed or alternative actions
NI = present, but not affected to a degree that detailed analysis is required
PI = present with potential for relevant impact that need to be analyzed in detail in the EA
NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Determi-nation	Resource	Rationale for Determination*	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
NI	Air Quality	The proposed action would not impact Air Quality in the area	Dave Corry	2/8/13
NI	Greenhouse Gas Emissions**	Ongoing scientific research has identified the potential impacts of anthropogenic (man-made) greenhouse gas (GHG) emissions and changes in biological carbon sequestration due to land management activities on global climate. However, there are currently no "credible scientific" methods to predict the potential climate change impacts from project specific GHG emissions. GHG emissions from the proposed action are anticipated to be extremely minor, therefore, it is not necessary to complete detailed quantification or modeling.	T. Croissant	3/26/13
PI	Wastes (hazardous or solid)	Application and storage of chemicals may be an issue. Safety requirements for application and storage of the herbicides need detailed discussion (including respirator requirements). Include who will be appling the herbicide contractor or BLM personnel.	R. Schreiner	2/11/13
NI	Water Resources/Quality (drinking/surface/ground)	The chemicals proposed for treatment have been approved to be used in this situation. The proposed treatment method and techniques used would not impact water quality in the area.	Dave Corry	2/8/13
NP	Areas of Critical Environmental Concern	The project does not pass through any existing ACEC's	T. Croissant	3/26/13
PI	Cultural Resources	Areas designated for burning activities should be coordinated with archaeology to ensure no significant adverse impacts occur, either direct or indirect, to archaeological properties in the vicinity.	W. Banek	2/20/13
NP	Native American Religious Concerns	The proposed action will not limit access to or interfere with the ceremonial use of sacred sites. Nor, will the proposed action have a significant effect to the physical or visual integrity of Native American sacred sites.	W. Banek	2/20/13
NP	Paleontology	No impact to paleontological Resources	R. Schreiner	2/11/13
NP	Geology / Mineral Resources/Energy Production	No mineral resources present or impacted.	R. Schreiner	2/11/13
NP	Environmental Justice	According to the EPA Region VIII, State of Utah, Environmental Justice Map, the region has been categorized as a minority population area of 10-20% and a poverty population area of 10-20%. 5-10% of the population speaks English "Less than Well". This data shows that low income	T. Croissant	

Determi-nation	Resource	Rationale for Determination*	Signature	Date
		and high minority populations are generally located in the St. George/Santa Clara/Washington areas in locations not adjacent to BLM managed lands. (see http://epamap14.epa.gov/ejmap/entry.html, 11/29/12). However, it is likely that a low income, minority population is also present in the housing area on the east side of the Shivwits Paiute Reservation, and a low income population exists in the Hildale/Colorado City area. These populations are not distinct on census data due to having been lumped in with higher income low-minority areas in Ivins, Apple Valley, and Springdale. No minority or economically disadvantaged communities or populations which could be affected by the proposed action or alternatives are present in or near the proposed project area.		
NI	Socio-Economics	The project area occurs within a rural area with no commercial and residential development. The socio-economic impact of the proposed project would be so small that it would have virtually no effect on the socio-economics of Washington county, UT.	T. Croissant	3/26/13
NI	Farmlands (Prime or Unique)	The proposed action is not expected to impact any prime or unique farmlands along the virgin river.	D. Corry	2/8/13
NI	Soils	Some soil might be disturbed during project implementation; however this impact is expected to be minimal and short term.	D. Corry	2/8/13
NI	Floodplains	The proposed action is not expect to impact floodplains along the Virgin River.	D. Corry	2/8/13
PI	Wetlands/Riparian Zones	No measurable negative impact to the wetlands, or the riparian zone is anticipated. In the long-term the project would benefit wetlands and riparian zone by maintaining native species over exotic species.	D. Corry B. Douglas	2/14/13
PI	Fish and Wildlife Excluding USFW Designated Species	The proposed action would result in minimal impacts to individual wildlife species on a rare and infrequent basis and over a large area. However, this action would not cause measurable impacts to fish or wildlife populations as a whole. The disturbance mechanisms would be of short duration and would cause no measurable impact. In the long-term, the project would be beneficial to BLM Sensitive and other wildlife species.	B. Douglas	2/14/13
PI	Migratory Birds	The proposed action would result in minimal impacts to *individual* Migratory Birds on a rare and infrequent basis and over a vast area. However, this action would not cause measurable impacts to Migratory Bird *populations* as a whole. The disturbance mechanisms would be of short duration and would cause no measurable impact. In the long-term the project would be beneficial to migratory birds and their habitat.	B. Douglas	2/14/13
NP	Threatened, Endangered or Candidate Plant Species	No threatened, endangered or candidate plant species are found in the project sites.	B. Douglas or T. Croissant	2/14/13
PI	Threatened, Endangered or Candidate Animal Species	The following threatened, endangered and candidate species occur (or may occur) in the project area: woundfin, Virgin River chub, Southwestern willow flycatcher, and yellow-billed cuckoo. No measurable impact to woundfin or Virgin	T. Croissant	2/14/13

Determi-nation	Resource	Rationale for Determination*	Signature	Date
		River chub is anticipated. From past Southwestern willow flycatcher, and yellow-billed cuckoo monitoring and surveys, no nesting or other special use areas have been identified in the project areas. No measurable impacts to Southwestern willow flycatchers or yellow-billed cuckoos are anticipated. In the long-term, the project would be beneficial to threatened, endangered and candidate species occurring along the Virgin River.		
PI	Vegetation Excluding USFW Designated Species	Through the removal of Arundo donax there is a chance that some native vegetation would also be removed or impacted. However by removing this invasive species, native riparian vegetation would likely establish in its place. In the long-term, the project would be beneficial to vegetation along the Virgin River through maintenance of native vegetation over exotic species.	Jackie Roaque, or Bob Douglas, or Dave Corry	2/14/13
NI	Woodland / Forestry	The proposed action is not expected to impact the woodland/forestry resource.	D. Corry	2/8/13
NI	Fuels/Fire Management	The project would not impact goals and objectives associated with the current BLM fire management plans addressing fuels and fire management within the project area.	T. Croissant	3/26/13
PI	Invasive Species/Noxious Weeds (EO 13112)	Removal of the invasive species, Arundo donax, would promote riparian system health and discourage further spread of the species along the Virgin River. The herbicides proposed for use (Glyphosate and Imazapyr) have not been previously identified for use within our field office. However both are identified in the "Vegetation Treatments Using Herbicides on Bureau of Land Management Land in 17 Western States Programmatic Environmental Impact Statement". Herbicide applicator must submit a Pesticide Use Proposal (PUP) for BLM approval before any application of herbicide is performed.	Jackie Roaque	2/14/13
NI	Lands/Access	The project would not impact any current land actions.	Teresa Burke	2/8/13
NI	Livestock Grazing	This project should not have any impact on livestock grazing	Jackie Roaque	2/14/13
PI	Rangeland Health Standards	This project would have a positive effect on rangeland health by removing an invasive riparian species which would then promote growth of native riparian vegetation and improve the health of the riparian system	Jackie Roaque	2/14/13
NI	Recreation	If the proposed action occurs in summer, some water-based recreation may be displaced, but this activity is not expected to impact recreational activities.	D. Kiel	3/27/13
NI	Visual Resources	The proposed action would have no impact on visual resources	D. Kiel	3/27/13
		NLCS		
NI	National Conservation Areas	Most of the proposed project area is within the Red Cliffs National Conservation Area. The primary concern for this part of the NCA is the desert tortoise, which is addressed under the T&E Animals section.	T. Croissant	3/26/13
NP	National Historic Trails (Old Spanish Trail)	The proposed action will have no significant impact to the physical or visual integrity of the Old Spanish Trail which would affect its listing to the National Register of Historic	B Banek	2/20/13

Determi-nation	Resource	Rationale for Determination*	Signature	Date
		Places.		
NP	National Recreational Trails (Gooseberry)	The proposed action is not in the vicinity of the Gooseberry Mesa National Recreation Trail	D. Kiel	3/27/13
NP	Wild and Scenic Rivers	This activity would not impact any designated, suitable, or eligible Wild and Scenic River segments	D. Kiel	3/27/13
NP	Wilderness/WSA	There are no designated wilderness areas in the project area. There are no Wilderness Study Areas in the St. George Field Office.	D. Kiel	3/27/13
NP	Areas with Wilderness Characteristics**	There are no lands with Wilderness Characteristics within the project area	D. Kiel	3/27/13

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
Environmental Coordinator			
Authorized Officer			

Arundo donax Current Populations and Land Status along the Virgin River Watershed in Washington Co. Utah