

**National Park Service  
U.S. Department of the Interior**



**SOUTHEAST UTAH GROUP:**

**Arches National Park, Canyonlands National Park,  
Hovenweep National Monument and Natural Bridges National  
Monument.**

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**Finding of No Significant Impact  
Exotic Plant Management Plan and Environmental  
Assessment/Assessment of Effect**

The National Park Service (NPS) will implement an Exotic Plant Management Plan (EPMP) to control exotic (non- native) plants at four parks located in the Southeast Utah Group (SEUG) area. The intent of this project is to manage exotic plants to reduce their negative effects on native plant communities and other natural and cultural resource within these parks. Parks included in this plan are Arches and Canyonlands National Parks and Hovenweep and Natural Bridges National Monuments.

Exotic plants are species that occur outside of their native ranges as a result of direct or indirect human actions. Exotic plants replace native plant communities, degrade wildlife habitats, and reduce the biological diversity of ecosystems. Currently, there are 92 exotic plant species found within the four park units of the Southeast Utah Group. Most of these plants are innocuous additions but some can become future problems. This plan proposes to treat approximately 21 of these species because they are exotic, aggressive, and can have detrimental effects on native communities. Other species may be treated in future years if time, funding, thorough analyses, and scientific knowledge show that doing so will truly help the ecosystem and is feasible.

The SEUG's Exotic Plant Management Plan was developed following National Park Service (NPS) guidelines for natural resource management and Integrated Pest Management (IPM) procedures. According to the guidelines, "Management of populations of exotic plant and animal species, up to and including eradication, would be undertaken wherever such species threaten park resources or public health and when control is prudent and feasible." (NPS *Management Policies*, 2006) Managers will take action whenever such species interfere with natural processes and the perpetuation of natural features or native species, especially those that are endangered, threatened, or otherwise unique. The IPM procedures have been and will continue to be used to determine when to control exotic plants and whether to use mechanical, physical, chemical, cultural, or biological means, or a combination of these. The NPS has prepared an Environmental Assessment (EA) that evaluates alternatives for establishing park guidelines that will be used to determine when and how to control non-native

plants. This includes the use of cultural, mechanical/manual, chemical, and biological means.

The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.), the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations 1500 through 1508) for implementing NEPA, and the NPS NEPA compliance guidance handbook (Director's Order (DO)-12, *Conservation Planning, Environmental Impact Analysis, and Decision-making*). An Assessment of Effect (AEF) in conjunction with this EPMP EA was developed to meet its obligations for NEPA and §106 compliance, in accordance with the Advisory Council on Historic Preservation's regulations implementing §106 (36 CFR 800.8, Coordination with the National Environmental Policy Act).

### **PREFERRED ALTERNATIVE**

Under Alternative 2, or the Preferred Alternative, the NPS will use an integrated pest management (IPM) approach to control exotic plants at the four parks. The NPS has a mandate to preserve natural and cultural resources now and for future generations. The preferred alternative will assist parks in meeting this mandate by implementing effective IPM practices.

IPM is a decision-making process that supports the NPS mission by coordinating knowledge of pest biology, the environment, and available technology to prevent unacceptable levels of pest damage, using environmentally sound, cost-effective management strategies that pose the least possible risk to people, park resources, and the environment. This process helps resource specialists determine whether treatment of an exotic plant is necessary and appropriate, where treatment should be administered, when treatment should be applied, and what strategies should be used for immediate and long-term results. IPM is done on a case-by-case basis, so that treatment strategies are tailored to local conditions. Each exotic plant's natural history is also evaluated before developing treatment strategies.

IPM employs multiple integrated management practices rather than a single solution, wherever technically and economically feasible. An integrated approach is often more effective than a single type of treatment. This plan considers all treatment methods that are currently being implemented by the four park units, or that may be used in the foreseeable future. IPM treatments that will be used under the Preferred Alternative include:

- Cultural Treatments — practices that promote the growth of desirable plants and reduce the opportunities for exotic plants to grow. Examples include irrigation and seeding of native plant species.
- Manual/Mechanical Treatments — physical damage to or removal of part or all of the plant. Examples include hand pulling, cutting, grubbing, haying, and mowing.
- Biological Treatments — biological control, or biocontrol - the use of "natural enemies", such as insects and microorganisms to reduce the abundance of an exotic plant. Examples include plant-feeding insects such as Chinese leaf beetles (*Diorhabda elongate deserticola*) for

tamarisk (*Tamarix* spp.), puncture vine weevils (*Microthrips* spp.) for puncturevine (*Tribulus terrestris*) and leaf beetles (*Galerucella* spp.) for purple loosestrife (*Lythrum salicaria*). APHIS approved biological agents will be host-specific and have a negligible risk for becoming a pest.

- Chemical Treatments — applying herbicides as prescribed by their labels, using a variety of application methods. Examples of application methods include portable sprayers, all-terrain vehicles (ATVs) equipped with sprayers, and aerial application (helicopter and fixed-wing).
- Prescribed Fire Treatments — applying fire to a predetermined area to reduce the growth of exotic plants and to increase the growth of desirable plants. In this plan, prescribed fire treatments will be only be used to burn brush piles of exotic vegetative debris like tamarisk and Russian thistle.

Under the Preferred Alternative, resource specialists will use a decision-making tool, developed specifically for this plan, for exotic plant management planning. In using this tool, resource specialists will follow a standard decision-making process to identify exotic plants, determine exotic plant management priorities, identify and evaluate the efficacy and environmental effects of the proposed treatment, consider alternative treatments having less impacts, justify why a treatment was selected, and confirm compliance with applicable policies and regulations. Resource specialists will also be able to use the results of this analysis to explain to the public how each of these factors was considered in selecting treatment methods.

### **BEST MANAGEMENT PRACTICES**

Best management practices (BMPs) were analyzed as part of the Preferred Alternative. BMPs have been designed to minimize, reduce, or eliminate the impacts from proposed activities under the Preferred Alternative (Alternative 2). The park's resource manager responsible for supervising exotic plant management activities is responsible for ensuring that BMPs or mitigation measures occur. The BMPs undertaken during project implementation will include, but will not be limited to those listed below.

#### **General**

- Equipment would use existing roads and trails to the maximum extent practical.
- Herbicides will be applied primarily by backpack sprayers and hand sprayers, and of specific criteria warrant, boom sprayers on ATV's and aircraft may be used.
- Herbicides would be applied according to application rates specified on the product label.
- Hand tools will be primarily used and only where hand tools are not feasible, chainsaws may be used.
- Equipment used for exotic plant management would be washed prior to entering a park to reduce the potential for accidentally introducing exotic plants from another area.

- Use of equipment in high visibility areas would be avoided to the extent feasible.
- The number of vehicle and equipment passes off-road (only on a case by case basis) would be minimized to the extent possible.
- NPS policy requires that only herbicides that are expected to be used in a 1- year period can be purchased at one time. Therefore, herbicides would not be stored for periods greater than one year. Herbicide efficacy is lost over time.

**Air Quality**

- Reduced application rates of herbicides would be used wherever possible. Reduced application rates are often more effective than higher application rates because translocation is enhanced prior to loss of physiologic function. Higher rates may burn off leaves and reduce translocation.
- Herbicide application would account for meteorological factors such as wind speed, wind direction, inversions, humidity, and precipitation in relation to the presence of sensitive resources near the treatment area and direction provided on labels. Herbicides would only be applied when meteorological conditions at the treatment site allow for complete and even coverage and would prevent drifting of spray onto non-target sensitive resources or areas used by humans.
- Herbicides would be applied only during periods of suitable meteorological conditions. Loss of spray from a treated area increases during high winds or low humidity. Herbicides should also not be applied during periods of dead calm (this could indicate an inversion) or when wind velocity and direction pose a risk of spray drift.
- Herbicides would be applied using coarse sprays to minimize the potential for drift. Avoid combinations of pressure and nozzle type that would result in fine particles (mist). Add thickeners if the product label permits.

**Soils**

- Vehicles used for control will avoid wetland areas with standing water or saturated soils, to the extent practical and will be operated to minimize disturbance to soils.
- Personnel and equipment would avoid areas having sensitive biological soil crusts, especially those including colored lichen, or areas that are prone to erosion.
- Off-road vehicles will not be operated where there are well-developed soil crusts, especially where there are mature soil crusts including colored (yellow, white, red, green, brown or blue) soil lichens.
- Damage to soils will be minimized by using existing access routes, when possible, avoiding sensitive biological soil crusts, especially those including colored lichens.
- Type of mowing equipment will be selected based on the patch size, density of the target species, and terrain and condition of biological soil crusts. Large, dense patches are suitable for vehicle-drawn mowing equipment, while small, dispersed patches are more suitable for control with hand-held equipment, such as a weed-whip.

- Hand raking will be used in smaller-scale sites if there are potential impacts to desirable vegetation or soil crusts.
- Where soil destabilization is not desired, the full removal of root systems will not be employed.
- Herbicides with longer persistence would be applied at lower concentrations and with less frequency to limit the potential for accumulation of herbicides in soils.

### ***Native Vegetation***

- Exotic plant management activities would only be used where necessary to promote the reestablishment of native plant communities.
- All mowing activities will be timed so that they are performed before there is a danger of contributing to the spread of viable seed.
- Cut plant material will be removed from the site if it may prevent establishment/growth of desirable vegetation and appropriately transported and disposed of in a way so that no propagules are spread. If plant material can or must be left, it will be piled or scattered in a way that it does not re-root or interfere with desirable vegetation.
- Re-vegetation will be implemented as quickly as possible to large areas of bare soil to reduce the danger of erosion caused by any loss of vegetative cover. Small areas that are adjacent to healthy native vegetation will be allowed to recover naturally, whenever possible.
- Selection of restoration species will be limited to native species that exist naturally in the region to prevent the accidental introduction of new exotic species. To minimize genetic contamination, propagules will be collected or propagated from the closest sites possible, as long as the collection site remains healthy and resilient to future disturbance. The benefits of local propagule collection must be weighed against the need for prompt re-vegetation. In many cases it may be more important to prevent establishment of non-desirable species and stabilize soils than to wait for sufficient seed to be collected locally.
- To limit the potential for equipment to spread exotic plant seeds, treatments should be completed before seed becomes viable.
- Planning will be utilized to assure that appropriate seed is available at the necessary time, and local collections will be prioritized based on available information concerning each species' genetic site-specificity.
- Parks would identify traditional use plants based on consultation with tribes. Traditional use plants are plants used or held sacred by Native American Tribes for medicinal, ceremonial, religious, or other cultural purposes.
- NPS staff would receive training on identification of traditional use plants and would avoid treating non-target plants to the extent feasible.
- Mechanical methods such as tilling would not be used in areas where traditional use plants are known to occur or have the potential to occur.
- Herbicides would be selected and BMPs would be implemented to maximize the effectiveness of the treatment on the target exotic plant and to minimize the potential effects on non-target plants.
- Herbicides would be applied as near to the target plant as possible.
- Herbicides would be applied at the appropriate time based on the herbicide's mode of action. Poor timing of application can reduce the

effectiveness of herbicides and can increase the impact on non-target plants.

***Water Resources (including wetlands and floodplains)***

- If drought conditions are forecasted, resource managers should delay the purchase and planting of shrubs to avoid the need for irrigation. Resource managers should also confirm that there is water available for irrigation should the need arise.
- Vehicles are only permitted on established roads and will not be driven up or down stream channels. The number of vehicles will also be minimized to the extent possible.
- Applications of herbicides would be avoided during periods and in areas where seasonal precipitation or excess irrigation water is likely to wash residual herbicides into waterways.
- Only herbicides that are registered for use in or near water will be used in those areas. Only those herbicides that have a low potential toxicity, such as glyphosate (Roundup Pro and Rodeo) would be used within areas near surface waters or in areas with a high leaching potential. Glyphosate is strongly adsorbed into soil, with little potential for leaching to ground water. Microbes in the soil readily and completely degrade it even in low temperatures. It tends to adhere to sediments when released to water and does not accumulate in aquatic life (Forest Service 2004).
- Herbicides with high soil retention would be used in areas where there is potential to affect surface water or ground water resources.
- As needed to protect the efficacy of the herbicide, water would be buffered, depending on hardness, pH, and other factors.
- Highly water-soluble herbicides would not be used in areas where there is potential to affect surface water or ground water resources.
- Herbicides with high volatility would not be used to treat areas located adjacent to sensitive areas because of the potential for unwanted movement of herbicides to these areas.
- In areas where there is the potential to affect surface water or ground water resources, herbicide pH and soil pH would be considered to select the herbicide with the lowest leaching potential.

***Threatened, Endangered and Species of Concern***

- Field personnel would be trained to recognize and avoid threatened, endangered, and candidate species in their travel routes.
- Prior to implementation of mechanical controls, areas that are potential habitat for listed wildlife species will be surveyed. If listed species are found in the vicinity of the treatment area, treatments will be limited to ones that are unobtrusive or to times of year when the listed species are not present or less affected by disturbance.
- Selection of restoration species will be limited to native species that exist naturally in the region, or non-native species that are known to not spread, to prevent the accidental introduction of new exotic plants that would endanger listed plant or wildlife values.
- Larger equipment associated with restoration, such as seed drills, seedbed preparation equipment or harrowing equipment will not be used in the

vicinity of listed plant species unless there is a direct benefit to the listed species.

- Restoration activities will be timed so that negligible disturbance to listed wildlife occurs.
- Herbicide use will be avoided in the vicinity of listed plant species.
- All restrictions outlined on herbicide labels will be followed.
- Chemical controls will be used in the vicinity of listed wildlife or their habitat when other weed management techniques might cause undue disturbance to listed wildlife or their habitat or are deemed infeasible.
- Herbicides that are of low toxicity to wildlife and/or that will degrade before wildlife are likely to encounter them will be used and will be applied in a manner that uses the least amount, but still remains effective and that best protects habitat for listed species.
- Ground-based equipment, including backpack sprayers and spray units on trucks will be used in low-wind conditions.
- If portable spraying is used to apply herbicides, establish a 5 foot no-spray zone around T & E species for treatments involving application of herbicides. Portable spraying allows for treatment of individual plants and the spray can be directed within an inch of the target plant.
- In the event that an area infested by one of the target species provides habitat for a listed species, weed management activities will be implemented in such a way that any potential adverse impacts to that species are negligible. If certain times of the year are less likely to cause disturbance than others, then for all treatments this will be implemented. If a critical feature (such as a snag or den) is within the treatment area, then for all treatments it will be maintained. Also, if a target species provides critical habitat for a listed species, such as nesting sites or a food source, then for all treatments it will be controlled in phases, so that native vegetation can be reestablished that will provide equivalent requirements and habitat is maintained.
- Burning of brush piles would not be conducted in T&E species' habitat during active periods. Project specific brush piles would be designed to prioritize the protection of habitat for T&E species.
- Treatments will be chosen as selectively as possible to minimize impacts to native species. "Broad brush" treatments (such as indiscriminately using ATVs or aerial sprayers for chemical treatments, or mechanical treatments such as mowing) will mostly be used for large, dense infestations of exotic plants. In contrast, individual exotic plants or smaller infestations interspersed with native plants will be treated using precise methods. These methods will allow for treatments of smaller areas or individual plants, while limiting the potential impact on non-target native species.
- ATVs would be used on a limited basis in areas where T&E species are known to occur or have the potential to occur and only along established roads.
- If boom treatments are used (on ATVs or aircraft) to apply herbicides, a 50-foot no-spray zone would be established around listed plants. GPS units within aircraft can guarantee this precision when additional BMP's are followed regarding herbicide treatments.

- Only bio-controls that are deemed host-specific by APHIS and other associated federal agencies using the best available science and monitoring techniques will approved for release in the parks, should they match the park's need for management of a particular species.
- When possible, all tamarisk treatments will occur outside the breeding bird period to protect migratory bird species.

**Wilderness**

- The Minimum Requirement Decision Guide will be used to determine whether the action is first necessary, then determines the alternatives (equipment, device, force, or practice) for how to accomplish the action that will achieve both Wilderness and resource objectives.
- Unavoidable impacts, such as vehicle tracks from ATVs, will be mitigated immediately after IPM activities are completed.
- SEUG will disseminate information to the public and staff on various control projects as to how and why particularly loud techniques, such as ATVs and aircraft, are necessary to accomplish project goals.

**Cultural Resources**

- Prior to treatments, the cultural resource manager or assigned staff will brief all weed management staff about issues regarding working around cultural resource sites.
- An annual work plan will be developed that identifies proposed treatment areas that have already been surveyed for cultural resources and where appropriate §106 compliance has been completed.
- Proposed treatment areas that have not been surveyed for cultural resources will be avoided until a survey and SHPO consultation and §106 compliance has been completed or see next bullet for only treatment option.
- In unsurveyed areas and only if feasible, handcutting of exotic vegetation and applying a basal chemical to exotic vegetation with a portable sprayer will be permitted. Portable spraying allows for treatment of individual plants and the spray can be directed within an inch of the target plant. Exotic vegetation will then be cut into manageable sizes and left. No ground disturbance will be permitted. No dragging material and building brush piles permitted.
- Surface disturbing activities, such as digging, pulling, tilling or use of heavy equipment, will not be allowed within the boundary of identified and eligible historic properties. Only handcutting of exotic vegetation with a portable basal chemical application will be permitted. Portable spraying allows for treatment of individual plants and the spray can be directed within an inch of the target plant. Exotic vegetation will be cut into manageable sizes and left. No ground disturbance will be permitted. No dragging material and building brush piles permitted.
- An archeological monitor must be present when treating areas within the boundaries of identified and eligible cultural resource sites.
- In the event that previously unknown cultural resources are encountered during manual or mechanical treatments, work will stop immediately and will not continue until the site can be evaluated by the park resource staff and appropriate §106 compliance has been completed.



- Use of herbicides within the boundaries of identified and eligible cultural resource sites would be prohibited.
- If portable spraying is used to apply herbicides, establish a 10 foot no-spray zone around cultural resources for treatments involving application of herbicides. Portable spraying allows for treatment of individual plants and the spray can be directed within an inch of the target plant. Care will be given when applying herbicides to limit drift.
- If boom treatments are used on ATVs or aircraft to apply herbicides, a 100 foot no-spray zone around cultural resources will be established. GPS units within aircraft can guarantee this precision when additional BMPs are followed regarding herbicide treatments (low wind conditions, etc.).
- Vehicle traffic, including ATV's, will be limited to existing paved and four wheeled drive roads to protect vulnerable cultural resources.
- To further reduce impacts by weed management on cultural resources, crews will stay on trails, use slickrock and dry washes and work in small teams.
- Burn piles will not be constructed within 100 feet of identified and eligible cultural resources.
- Parks would identify traditional use plant species based on consultation with Native American tribes.
- NPS staff would receive training on identification of traditional use plants and would avoid treating non-target plants to the extent feasible.
- No manual/mechanical and chemical treatment will take place within 300 feet of identified (through Native American tribe consultation) sacred springs and seeps.
- Biological control agents may be allowed within the Hackberry spring area.

#### ***Visitor Use and Experience***

- Exotic plant management activities will be timed to coincide with low visitor use periods.
- Visitor access will be restricted from some areas during the burning of brush piles and chemical applications.
- SEUG will disseminate information to the public and staff on various control projects as to how and why particularly loud techniques, such as ATV's and aircraft are necessary to accomplish project goals.

#### ***Human Health and Safety***

- Safety protocols for storing, mixing, transporting, handling spills, and disposing of unused herbicides and containers are included in Appendix E and would be followed at all times. Plans for emergency spills are also included in Appendix E.
- All SEUG employees, volunteers and contractors will be advised and required to follow the safety plan.
- Use of appropriate personal protective equipment PPE will be used when implementing control techniques.
- All SOP's will be reviewed and followed prior to implementation.
- All herbicide labels will be followed to ensure that proper application is used in a safe manner.

- A Job Hazard Analysis for herbicide application will be reviewed prior to implementation.
- Signs will be posted to inform visitors of chemically treated areas. Chemically treated areas will be temporarily closed off to visitors. All federal, state, and local regulations regarding herbicide use would be followed at all times.
- All product labels would be read and followed by herbicide applicators. It is a violation of federal law to use an herbicide in a manner that is inconsistent with its label.
- Herbicide applicators would obtain any certifications or licenses required by the state and/or county.
- All concessionaires would comply with the EPMP/EA/AEF and NPS policy when applying herbicides. Concessionaires would comply with guidance document, *"Understanding the National Park Service's Integrated Pest Management Program"* (NPS 2003).

### **ALTERNATIVES CONSIDERED**

The EA analyzed two alternatives, including Alternative 1, the No-Action Alternative, and Alternative 2, the Preferred Alternative. Under the No Action Alternative, exotic species would be managed as they are currently, on a case-by-case basis without regard to SEUG priorities. Species and areas where control of exotics would be undertaken would be managed according to NPS policy, IPM processes, and regulations concerning use of herbicides. Follow-up and post-control evaluations would be made and re-treatment recommended when evaluations warrant.

### **ENVIRONMENTALLY PREFERRED ALTERNATIVE**

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that, "The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's § 101:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects to our national heritage and maintain, wherever possible, an environment that supports diversity and a variety of individual choice;
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of renewable resources."

Following environmental analysis, the Environmentally Preferred Alternative is the alternative that causes the least damage to the biological and physical environment or that best protects and enhances the natural, historic, and cultural resources of the site. Alternative 2 will contribute to meeting five of the six NEPA goals in the project area. Based on the analysis prepared in this environmental assessment, Alternative 2 is considered the environmentally preferred alternative.

Alternative 2 will contribute to *"fulfill the responsibilities . . . as trustee of the environment,"* by providing more control techniques to exotics which will minimize the economic, ecological, and human health impacts that invasive species cause.

*"Safe, healthful . . . and aesthetically . . . pleasing surroundings"* will better be attained by Alternative 2. As mentioned above, this alternative will provide greater control of exotics which will enhance the most valued recreational opportunity within the SEUG parks, scenic viewing.

Alternative 2 will provide a *"range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences."* The overall effect of Alternative 2 will improve the native landscape within the SEUG parks. As long as the herbicides are approved through the NPS process, applied and disposed of in accordance with label instructions, and stored according to NPS standards, risk of health or safety is minimized.

Alternative 2 will aid in restoring the integrity of the cultural resources within the SEUG parks. This alternative will aid in achieving *"a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities"* by enabling preservation of campground spaces, maintaining usable trails, keeping vistas open by preserving them from aggressive exotic vegetation growth..

Alternative 2 would much contribute to or detract from enabling the NPS to achieve *"a balance between population and resource use."*

Alternative 2 is environmentally preferred alternative. The deciding factors include:

Alternative 2 provides flexibility in matching the best IPM treatment strategy to the site, target species, conditions, and sensitivity of area. It is based on a sound understanding of the ecology and biology of the exotic pest and its environment. As an adaptive management tool, information about those resources that are managed is continuously updated and used to make adjustments to management approaches.

#### **WHY THE PREFERRED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT EFFECT ON THE HUMAN ENVIRONMENT**

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria:

***Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal Agency believes the balance of the effect will be beneficial.***

Under the Preferred Alternative, treatment and removal of exotic plants will have both adverse and beneficial impacts to the parks visual resources, water resources, wild and scenic rivers, floodplains and wetlands, native vegetation, terrestrial wildlife, aquatic wildlife and fisheries, threatened, endangered and species of concern, wilderness, historic structures, visitor use and experience, and human health and safety.

Some minor to moderate, adverse, short-to-long-term impacts to may occur to visual resources, water resources, wild and scenic rivers, terrestrial wildlife, aquatic wildlife and fisheries, threatened and endangered species and wilderness and from the use of manual/mechanical treatment, herbicides, biological treatments and pile burning. On a small scale, non-target vegetation may show signs of chemical burns from localized herbicide drift. Moderate impacts would likely occur in areas (along the river corridors, trails, and vistas), where large infestations of exotic plants have been physically removed by mechanical methods, responses to chemical treatments, defoliation by bio-control agents and where brush piles are built. These areas may be devoid of vegetation until native vegetation becomes reestablished through reseeding and other treatments.

However, long-term, moderate, beneficial impacts on visual resources, water resources, wild and scenic rivers, floodplains and wetlands, native vegetation, terrestrial wildlife, aquatic wildlife and fisheries, threatened and endangered species, wilderness, visitor use and experience, human health and safety and socioeconomics will result from Alternative 2. Removal of exotic plants that affect riparian areas (such as purple loosestrife, Russian olive, and tamarisk) will help return some surface waters to natural flows, reduce visual obstructions along riverbanks, and create additional habitat if these plants are removed. IPM will assist the SEUG parks to have surface waters and ground waters perpetuated, natural floodplain values restored, and natural values of wetlands preserved. Wilderness areas and visual resources would benefit by distant views being opened up with the removal of large exotic species like tamarisk and local foregrounds would also be enhanced with the removal of exotics. Controlling exotic plants and promoting healthy native plant communities would also rehabilitate wildlife habitat.

The beneficial impacts of the Preferred Alternative would promote overall natural native vegetative landscapes and would assist the parks to achieve the desired condition to have, as parts of the natural ecosystems of parks, all native plants restored and to maintain long-term ecological diversity and stability. IPM methods would also provide more tools to use to control and/or remove exotic plants which would provide a safer, effective and more natural environment to work in and experience.

Impacts of other alternatives (archeological resources, soundscapes, air quality, soils, and geology) varied and are described in the EA/AEF.

***Degree of effect on public health or safety:***

NPS *Management Policies* (2006) advocate a safe work environment for employees and a safe experience for park visitors. The equipment proposed for use such as hand tools, chainsaws, portable sprayers, ATVs, and aircraft are all standard devices with established safety protocols. Training on the proper use of equipment is included as part of the Preferred Alternative and as long as herbicides are used in accordance with project labels and the mitigation measures described herein, there will be no long-term adverse impacts on human health and safety under the Preferred Alternative.

***Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas:***

Cultural resources (including archaeological resources, ethnographic resources and historic structures); wild and scenic rivers; floodplains and wetlands; and wilderness will be affected by implementation of the Preferred Alternative. These will be long-term, minor to moderate beneficial impacts due to removal of exotic plants which will ensure that these unique characteristics are preserved.

***Degree to which effects on the quality of the human environment are likely to be highly controversial:***

There were no highly controversial effects identified during either preparation of the environmental assessment or the public review period.

***Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks:***

There were no highly uncertain, unique, or unknown risks identified during either preparation of the environmental assessment or the public review period.

***Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration:***

The NPS will implement the Exotic Plant Management Plan and managers will take action whenever such species interfere with natural processes and the perpetuation of natural features or native species, especially those that are endangered, threatened, or otherwise unique. The IPM procedures will continue to be used to determine when to control exotic plants and whether to use cultural, mechanical/manual, chemical, cultural, or biological means, or a combination of these.

These future activities will not result in significant adverse effects on the natural or human environment; overall environmental effects will be beneficial. The Preferred Alternative will not represent a decision in principle about a future consideration.

***Whether the action is related to other actions with individually insignificant but cumulatively significant impacts:***

Cumulative effects were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions at each park unit. A number of past, ongoing, or reasonably foreseeable future actions within

each park unit and in the surrounding region of each park unit were identified and analyzed in the environmental assessment. Cumulative impacts vary by resource; however, cumulative impacts are not expected to be greater than moderate in intensity. The relative adverse contributions of the Preferred Alternative to the overall cumulative impacts are predicted to be negligible. However, in some cases the Preferred Alternative will have a beneficial contribution to the overall cumulative impacts.

***Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical places:***

The Southeast Utah Group developed an Assessment of Effect in conjunction with this EA to meet its obligations for NEPA and under §106 of the National Historic Preservation Act, in accordance with the Advisory Council on Historic Preservation's regulations implementing §106 (36 CFR 800.8, Coordination With the National Environmental Policy Act). Consultation and comment were solicited from the Colorado and Utah State Historic Preservation Officers (SHPO). As discussed in the EA/AEF, archaeological resources, historic structures, and ethnographic resources will be affected by implementation of the Preferred Alternative. Overall cultural resources will be beneficially affected by implementation of the Preferred Alternative.

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the NPS concludes that implementation of the Preferred Alternative will have *no adverse effect* on cultural resources within the SEUG. The SEUG sent a letter stating such to both Colorado and Utah SHPO offices in February 2009 requesting concurrence with this finding.

Concurrence with this determination was received from the Utah SHPO on February 16, 2009 and the Colorado SHPO on April 24, 2009.

***Degree to which the action may adversely affect an endangered or threatened species or its critical habitat:***

The biological assessment of federally threatened, endangered and candidate species describes accounts of eleven species that occur or potentially occur within at least one of the four parks included in this plan. In accordance with the Endangered Species Act, §7, consultation with the U.S. Fish and Wildlife Service (USFWS) concerning impacts to threatened and endangered species was initiated during the initial drafting of this EPMP/EA. In June of 2008, public scoping letters describing the proposed action were sent to the Utah and Colorado Ecological Services Offices of the USFWS. Responses to the public scoping letter, including threatened, endangered, and candidate species lists, were received from Utah and Colorado on July 30 and September 17, 2008 respectively. A biological assessment was then prepared that included determination of effect for each of the eleven species to be "*may effect but not likely to adversely affect*". Additional conservation measures specific to each of the eleven species can be found in the EA/AEF and biological assessment.

Concurrence with the above determinations was received from Utah USFWS office on May 21, 2009.

***Whether the action threatens a violation of federal, state, or local environmental protection law:***

In addition to reviewing the list of significance criteria, the National Park Service has determined that implementation of the proposal will not constitute an impairment to any of the four parks' resources and values. This conclusion is based on a thorough analysis of the environmental impacts described in the environmental assessment, public comments received, relevant scientific studies, and the professional judgment of the decision-maker guided by direction in the 2006 NPS *Management Policies*.

**APPROPRIATE USE, UNACCEPTABLE, IMPAIRMENTS**

Sections 1.5 and 8.12 of NPS *Management Policies* underscore the fact that not all uses are allowable or appropriate in units of the National Park System. The proposed use was screened to determine consistency with applicable laws, executive orders, regulations and policies; consistency with existing plans for public use and resource management; actual and potential effects to park resources; total costs to the Park Service; and whether that public interest would be served. This plan is an appropriate use according to Director's Order 77-*Resource Management Reference Manual*, the SEUG's 1996 Resource Management Plan and each park's general management plan and IPM Policies.

Therefore, the Park Service finds that the preferred alternative is an appropriate use. Because the application of mitigating measures is expected to be successful in ensuring that no major adverse impacts would occur and that satisfactory exotic plant management techniques are expected to be achievable, implementation of the preferred alternative would not result in any unacceptable impacts.

In analyzing impairments in the NEPA analysis for this project the NPS takes into account the fact that if an impairment were likely occur, such impacts would be considered to be major or significant under CEQ regulations. This is because the context and intensity of the impact would be sufficient to render what would normally be a minor and major or significant. Taking this into consideration, NPS guidance documents note that "Not all major or significant impact under a NEPA analysis are impairments. However, all impairments to NPS resources and values would constitute a major or significant impact under NEPA. If an impact results in impairment, the action should be modified to lessen the impact level. If the impairment cannot be avoided by modifying the proposed action, that the action cannot be selected for implementation." ("Interim Technical Guidance on Assessing Impacts and Impairment to Natural Resources" National Park Service, Natural Resource Program Center, July 2003).

In addition, to reviewing the definition of "significantly" under the NEPA regulations, the NPS has determined that implementation of the preferred alternative would not constitute an impairment to the integrity of the Southeast Utah Group Parks' resources and values as described by NPS *Management Policies* (NPS 2006 §1.4) This conclusion is based on the NPS's analysis of the environmental impacts of the proposed action as described in the EA, the public

comments by the direction in 2006 NPS Management Policies. The EA identified less than major adverse impacts on geology, soils, air, visual resources, water resources, floodplains and wetlands, native vegetation, terrestrial wildlife, aquatic wildlife and fisheries, threatened, endangered and state species of concern, wilderness, cultural resources (archeological resources, ethnographic resources, historic structures), and the human environment (visitor use and experience, human health and safety, soundscape and socioeconomics). This conclusion is further based on the Superintendents' professional judgment, as guided and informed by each park's general and resource management plans and the fire management plan. Although the plan/project has some negative impacts, in all cases these adverse impacts are the result of actions taken to preserve and restore other park resources and values. Overall, the plan results in benefits to park resources and values, opportunities for their enjoyment, and it does not result in their impairment.

### **PUBLIC INVOLVEMENT**

To ensure that the SEUG and its programs are coordinated with the programs and objectives of State, Federal, and local governments and private organizations, it is the SEUG's objective to work with these agencies and organizations during the planning process. Consultation and coordination have occurred with numerous agencies during the preparation of this EA.

The release of the public review document was announced widely through press releases distributed by each park. The plan was posted on NPS Planning, Environment, and Public Comment website (PEPC) at <http://parkplanning.nps.gov/>. The document then underwent a 30-day public review period from February 4, 2009 to March 6, 2009. A copy of the EA was sent to all persons who requested a copy, as well as to other pertinent agencies and individuals potentially affected by the Preferred Alternative. No substantive public comments were received during the public review process.

### **CONCLUSION**

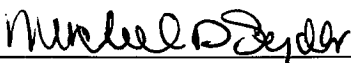
In consideration of the comments received throughout the planning process, careful review of potential resource and visitor impacts, and developing appropriate mitigation to protect resources, the Preferred Alternative best strikes a balance between the widest range of use and enjoyment of the Southeast Utah Group parks without degradation of the environment or risk of health or safety.

The Preferred Alternative does not constitute an action that normally requires preparation of an Environmental Impact Statement (EIS). The Preferred Alternative will not have a significant effect on the human environment. Negative environmental impacts that could occur are negligible to moderate. There are no unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any Federal, State, or local environmental protection law. In addition to reviewing the list of significance

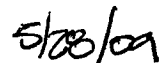


criteria, the National Park Service had determined that implementation of the proposal will not constitute an impairment to any of the four parks' resources and values. Based on the foregoing, it has been determined that an EIS is not required for this proposed project on NPS lands, and thus, will not be prepared. Implementation may take place immediately after the date of this decision.

Approved: \_\_\_\_\_



Michael D. Snyder  
Regional Director, NPS Intermountain Region



Date

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## Errata Sheets

### Southeast Utah Group Exotic Plant Management Plan and Environmental Assessment/Assessment of Effects

There were no substantive public comments regarding the Southeast Utah Group Exotic Plant Management Plan. However, some changes to text in the EA/AEF resulted from additional consultation with the Utah USFWS and Colorado SHPO.

#### TEXT CHANGES

In **Section 2.3 Best Management Practices**, page 70, revise the entire **Cultural Resources** text to:

- Prior to treatments, the cultural resource manager or assigned staff will brief all weed management staff about issues regarding working around cultural resource sites.
- An annual work plan will be developed that identifies proposed treatment areas that have already been surveyed for cultural resources and where appropriate §106 compliance has been completed.
- Proposed treatment areas that have not been surveyed for cultural resources will be avoided until a survey and SHPO consultation and §106 compliance has been completed or see next bullet for only treatment option.
- In unsurveyed areas and only if feasible, handcutting of exotic vegetation and applying a basal chemical to exotic vegetation with a portable sprayer will be permitted. Portable spraying allows for treatment of individual plants and the spray can be directed within an inch of the target plant. Exotic vegetation will then be cut into manageable sizes and left. No ground disturbance will be permitted. No dragging material and building brush piles will be permitted.
- Surface disturbing activities, such as digging, pulling, tilling or use of heavy equipment, will not be allowed within the boundary of identified and eligible historic properties. Only handcutting of exotic vegetation with a portable basal chemical application will be permitted. Portable spraying allows for treatment of individual plants and the spray can be directed within an inch of the target plant. Exotic vegetation will be cut into manageable sizes and left. No ground disturbance will be permitted. No dragging material and building brush piles will be permitted.
- An archeological monitor must be present when treating areas within the boundaries of eligible cultural resource sites.
- In the event that previously unknown cultural resources are encountered during manual or mechanical treatments, work will stop immediately and will not continue until the site can be evaluated by the park resource staff and appropriate §106 compliance has been completed.
- Use of herbicides within the boundaries of identified and eligible cultural resource sites would be prohibited.
- If portable spraying is used to apply herbicides, establish a 10 foot no-spray zone around cultural resources for treatments involving application

of herbicides. Portable spraying allows for treatment of individual plants and the spray can be directed within an inch of the target plant. Care will be given when applying herbicides to limit drift.

- If boom treatments are used on ATVs or aircraft to apply herbicides, a 100 foot no-spray zone around cultural resources will be established. GPS units within aircraft can guarantee this precision when additional BMPs are followed regarding herbicide treatments (low wind conditions, etc.).
- Vehicle traffic, including ATV's, will be limited to existing paved and four wheeled drive roads to protect vulnerable cultural resources.
- To further reduce impacts by weed management on cultural resources, crews will stay on trails, use slickrock and dry washes and work in small teams.
- Burn piles will not be constructed within 100 feet of eligible cultural resources.
- Parks would identify traditional use plant species based on consultation with Native American Tribes.
- NPS staff would receive training on identification of traditional use plants and would avoid treating non-target plants to the extent feasible.
- No manual/mechanical and chemical treatment will take place within 300 feet of identified (through Native American Tribal consultation) sacred springs and seeps.
- Biological control agents may be allowed within the Hackberry spring area.

In **Section 2.3.1 Committed Conservation Measures for Threatened, Endangered, and Species of Concern**, page 74, add additional conservation measures (*italized text*) for the southwestern willow flycatcher.

- Treatment areas could be evaluated for southwestern willow flycatcher nesting and roosting habitats prior to conducting any exotic plant management activities. *Southwest willow flycatcher surveys according to the FWS approved protocol will be completed in any suitable habitats prior to habitat treatments.* Suitable nesting/roosting habitat is any dense stand of cottonwood, willows, tamarisk or Russian olive in association with rivers, streams, or any significant body of water, or areas of saturated soils. *(See page 11 of the Final Recovery Plan for Southwestern Willow Flycatcher for a detailed list of tree and shrub species used by nesting southwestern willow flycatcher (USFWS 2002).)*
- A disturbance-free buffer area of a *minimum 300 feet* could be maintained around any active southwestern willow flycatcher nests year round and no treatments will occur during the nesting season. *Instead the NPS will coordinate with the FWS and UDWR to develop a revegetation and restoration plan for the areas within 300 feet of identified nests. Larger buffers will be considered if the activity includes high noise levels or long-term disturbances.*
- *Removal of tamarisk on a broad scale (10-200 acres) will only be conducted after a wildfire. Wildfires, which are infrequent within the parks, have the potential to naturally destroy southwestern willow flycatcher habitat. Typically, treatment (cut stump and chemical*

*application to stump or basal spray to new sprouts) of tamarisk is conducted on a smaller scale (less than 2 acres) and is site-specific.*

- *There will be no clear cutting of large areas (i.e. greater than 2 acres) of exotic species.*
- *Release of the tamarisk leaf beetle, will not be permitted in the parks until it is approved by APHIS in Utah. If and when the leaf beetle will be approved, formal Section 7 consultation will have to be reinitiated.*
- *Only willows, cottonwoods and other native vegetation species will be used to reseed and/or replant treated areas.*

On **Table 2-8, Environmental Impact Summary by Alternative**, page 82, under **Alternative 2-Preferred Alternative for Wild and Scenic Rivers**, delete text: "to major".

In **Section 3.4.1 Archeological Resources**, page 132, delete paragraph under **ARCH**: "Arches National Park has archeological remnants from more than 239 documented sites representing the four broad archeological periods. Most sites known in the park are also from the archaic period. The first peoples to inhabit Arches were archaic hunter-gathers. The majority of known cultural resources in the park appear to date from 8,000 BC to A.D. 1. Archaic people entered Arches primarily to gather the fine cherts found in the Summerville Formation. Summerville Chert was used by Archaic and later peoples for stone tools. Consequently, surface scatters of stone tools and debris from the manufacture and sharpening of Summerville stone tools comprise the majority of the archeological sites in Arches, as well as the main components of museum collections from the park. A few Barrier Canyon Style rock art panels, possibly dating from the archaic period, have also been documented in the park.

Archeological resources that are in the proposed treatment areas are primarily lithic scatter and Barrier Canyon Style rock art."

In **Section 3.4.1 Archeological Resources**, page 132, insert the following text instead of the paragraph described above under **ARCH**: "A total of 3284 acres, or approximately 4% of the park, has been surveyed for archeological resources, resulting in the documentation of 239 sites. While most sites identified in the park are temporally and culturally non-specific lithic scatters, there is limited evidence that four broad archeological periods are represented and include the paleoindian period (12,000-8,000 B.P.), the archaic period (9,000 B.P. - A.D. 200), the formative period (A.D. 200-1300), and the protohistoric period (A.D. 1300-1850) (Kramer 1991:20-21). Historic euroamerican occupation is also well-documented within Arches National park.

*The first peoples to inhabit Arches were archaic hunter-gathers. The majority of known cultural resources in the park appear to date from 8,000 BC to A.D. 1. Archaic people entered Arches primarily to gather the fine cherts found in the Summerville Formation. Summerville Chert was used by archaic and later peoples for stone tools. Consequently, surface scatters of stone tools and debris from the manufacture and sharpening of Summerville stone tools comprise the majority of the archeological sites in Arches, as well as the main components of museum collections from the park. A few Barrier Canyon Style rock art panels, possibly*

*dating from the archaic period, have also been documented in the park (Noxon and Marcus 1982).*

*Only a few structures and prehistorically identified ceramic scatters are known to exist in Arches, although these would certainly indicate a formative period occupation. Protohistoric remains include several petroglyph sites with late-period elements, as well as datable ceramics from the post-formative period (Kramer 1991: 21).*

*The Courthouse Wash panel and the Old Spanish Trail are listed on the National Register of Historic Places (NPS 2008c) and may be impacted by the proposed plan. An additional prehistoric structure within a proposed treatment area is a granary. Fifty-eight additional sites have either been recommended as eligible or determined eligible for listing on the National Register."*

**In Section 3.4.1 Archeological Resources**, page 133, delete paragraph under **CANY**: "Canyonlands National Park has archeological remnants from more than 1530 documented sites representing the four broad archeological periods. Most sites known in the park are from the archaic period. Evidence of Archaic occupation within the park includes Barrier Canyon Style rock art panels that can be seen in Horseshoe Canyon. (Schaafsma 1971). In the Needles District, Archaic projectile points provide further evidence for archaic occupation.

Archeological resources that are in the proposed treatment areas are primarily lithic and ceramic scatter and rock art."

**In Section 3.4.1 Archeological Resources**, page 133, insert the following text instead of the paragraph described above under **CANY**: "To date, 10,362 acres, or approximately 3% of the park, has been surveyed for archeological resources, resulting in the documentation of 1539 sites. Four broad archeological periods are represented in the archeological record including the paleoindian period (12,000-8,000 B.P.), archaic period (9,000 B.P. - A.D. 200), formative period (A.D. 200-1300), and protohistoric period (A.D. 1300-1850).

*Most sites known in the park are from the archaic period. Evidence of archaic occupation within the park includes Barrier Canyon Style rock art panels that can be seen in Horseshoe Canyon (Schaafsma 1971). In the Needles District, archaic projectile points provide further evidence for archaic occupation.*

*Three Clovis points have been collected in CANY, suggesting geographically broad but sparse paleoindian occupation (Tipps 1989). Evidence of archaic occupation within the park includes Barrier Canyon Style rock art panels that can be seen in Horseshoe Canyon (Schaafsma 1971) and Needles District (Noxon and Marcus 1982). In the Needles District, archaic projectile points provide further evidence for archaic occupation.*

*The majority of sites in CANY date to the late formative period, and in particular, during the Pueblo II-III time period. This period is characterized by large masonry roomblocks including kivas, granaries, and habitation structures. Ceramics, grinding implements and petroglyph panels attest to the complexity of material culture during this period."*

In **Section 3.4.1 Archeological Resources**, page 133, delete paragraph under **HOVE**: "Hovenweep National Monument has archeological remnants from more than 94 documented sites representing the three broad archeological periods. Most sites known in the park are from the Ancestral Puebloan period.

By about A.D. 900 the ancestral Puebloan started to settle at Hovenweep year-round, planting and harvesting crops in the rich soil of the mesa top. By the late 1200's, the Hovenweep area was home to over 2,500 people. Most of the structures at the monument were built between A.D. 1200 and 1300. Similarities in architecture, masonry, and pottery styles indicate the inhabitants of HOVE were closely associated with groups living at Mesa Verde and other nearby sites. The structures were built skillfully and in a variety of shapes and sizes including square and circular towers, D-shaped dwellings and many kivas. Many structures are still standing after more than 700 years. At the end of the 13<sup>th</sup> century, it is thought that a prolonged drought combined with resource depletion and war forced the inhabitants of HOVE to depart.

The Goodman Point unit, one proposed treatment site, consists of a large, collapsed ancestral Pueblo village that was inhabited during the Pueblo II and Pueblo III time periods, approximately spanning the years AD 900 to AD 1300. The village site consists of approximately 1,000 rooms, with numerous kivas and towers. One great kiva is located at the southern edge of the site. There is evidence of a roadway remnant in the northern portion of the unit. There is also evidence of check dams, ditches, and other remnants of irrigation systems.

Hackberry Unit consists of architecture built approximately 800 years ago by the ancestors of today's Puebloan people. Archeologists speculate that Hackberry canyon may have had one of the largest populations of all the Hovenweep units because of the constant seepage of water in the canyon. As many as 250 to 350 people may have lived here. It is unclear if the residents were related or represented different clans and lineages. The concentrations of structures at Hackberry demonstrate the importance of water to the people who lived here. Large multi-story pueblos and towers, located at canyon heads with seeps and springs, are the defining characteristics of the late Pueblo III time period.

Archeological resources that are in the proposed treatment areas are primarily lithic scatter, petroglyphs and architecture."

In **Section 3.4.1 Archeological Resources**, page 133, insert the following text instead of the paragraph described above under **HOVE**: "*A total of 430 acres, or approximately 55% of the monument, has been surveyed for archeological resources, resulting in the documentation of 94 sites. The majority of the documented sites date to the Pueblo III period (A.D. 1100-1300), but there is some evidence for earlier occupations of the area.*

*By A.D. 900, Ancestral Puebloans started to settle at Hovenweep year-round, planting and harvesting crops in the rich soil of the mesa tops. By the late 1200's, the Hovenweep area was home to over 2,500 people. Most of the structures at the monument were built between A.D. 1200 and 1300. Similarities in architecture, masonry, and pottery styles indicate the inhabitants of HOVE were closely associated with groups living at Mesa Verde and other nearby sites (Hovezak et al. 2004). The structures were built skillfully and in a variety of*

*shapes and sizes including square and circular towers, D-shaped dwellings and many kivas. Many structures are still standing after more than 700 years. At the end of the 11<sup>th</sup> century, Hovenweep, along with the entire four corners area, was abandoned for reasons that are still being debated.*

*Portions of Goodman Point and Hackberry Units contain areas proposed for exotic weed treatment. In 2004, a 100 percent Class III survey of the 142-acre Goodman Point Unit was conducted by Crow Canyon Archeological Center. Forty-two sites were documented within 56 temporal components (Hovezak et al, 2004), and all were determined eligible for inclusion on the National Register of Historic Places on July 21, 2004 by the Colorado SHPO. One great kiva is located at the southern edge of the Unit and there is evidence of a roadway remnant in the northern portion of the Unit. There is also evidence of check dams, ditches, and other remains of irrigation systems. The Hackberry Unit was determined eligible for inclusion in the National Register of Historic Places on April 12, 2007 by the Colorado SHPO."*

In **Section 3.4.1 Archeological Resources**, page 134, delete paragraph under **NABR**: "Natural Bridges National Monument has archeological remnants from more than 530 documented sites representing the three broad archeological periods listed below. Most sites known in the park are from the Ancestral Puebloan period. Around A.D. 700 the ancestral Puebloan people moved onto the mesa tops to dry farm but the area was later abandoned until about 1110 AD, when immigrants moved here from across the San Juan River and built single-family houses throughout the best watered areas. In the 1200s, farmers from Mesa Verde migrated here, but by 1300, all the ancestral Puebloans migrated south. Ceramics and masonry structures from the Anasazi are the best known cultural resources in Natural Bridges. The Horsecollar Ruin site is among the largest and best preserved ancestral Puebloan structures in the Monument.

In **Section 3.4.1 Archeological Resources**, page 134, insert the following text instead of the paragraph described above under **NABR**: "A total of 7107 acres, or approximately 93% of the monument, has been surveyed for archeological resources, resulting in the documentation of 530 sites. These sites represent three broad archeological periods including the archaic period (9,000 B.P. - A.D. 200), the formative period (A.D. 200-1300), and the protohistoric period (A.D. 1300-1850) (McVickar 2001).

*Most sites known in the park are from the formative period. Around A.D. 700 the Ancestral Puebloan people moved onto the mesa tops to dry farm but the area was later abandoned until about AD 1000, when immigrants moved back from across the San Juan River and built single-family houses throughout the best watered areas (McVickar 2001: 32). In the 1200s, farmers from Mesa Verde migrated here, but by 1300, all the Ancestral Puebloans migrated south. Ceramics and masonry structures from these time periods are the best known cultural resources in Natural Bridges."*

In **Section 3.4.3**, page 136, change title, from "Historic and Prehistoric Structures" to "Historic Structures".

In **Section 3.4.3**, page 136, delete the following sentence: "The term "historic structures" refers to both historic and prehistoric structures, which are defined as constructions that shelter any form of human habitation or activity."

In **Section 3.4.3**, page 136, insert the following text instead of the sentence described above: "According to the *NPS-28: Cultural Resource Management Guideline*, "a historic structure is "a constructed work . . . consciously created to serve some human activity." Historic structures are usually immovable, although some have been relocated and others are mobile by design. They include buildings and monuments, dams, millraces and canals, nautical vessels, bridges, tunnels and roads, railroad locomotives, rolling stock and track, stockades and fences, defensive works, temple mounds and kivas, ruins of all structural types, and outdoor sculpture".

In **Section 4.6.6 Wild and Scenic Rivers**, page 172, under **Impacts of Alternative 2** in **Conclusion** section, delete text: "to major".

In **Section 4.6.11 Threatened, Endangered and Species of Concern, Impacts of Alternative 2**, page 192, insert additional *italicized* text as follows to the southwestern willow flycatcher **Summary** paragraph:

*"There is the potential for direct and indirect impacts. Potential loss of southwestern willow flycatcher nesting habitat caused by leaf beetle defoliation is a high concern for FWS with regard to the proposed tamarisk biocontrol program because it is known to nest in tamarisk below the 37<sup>th</sup> parallel. Temporary loss of nesting habitat due to beetle predation on tamarisk is expected to impact resident or migratory bird populations in/adjacent to treatment areas. However, tamarisk leaf beetles (*Diorhabda elongata deserticola*) will not be released in the parks until approved by APHIS in Utah.*

Misuse of herbicides or accidental spills may kill or damage cottonwoods southwestern willow flycatchers use for nesting. Vegetation treatments in close proximity to nesting southwestern willow flycatchers may alter normal behavior, resulting in missed foraging opportunities or failed/abandoned nests.

*Nevertheless*, implementation of the EPMP is expected overall to improve southwestern willow flycatcher habitat over the long term primarily by removing exotic species and allowing native cottonwoods and willow to re-colonize riparian corridors and allow greater diversity and perhaps abundance of insects eaten by flycatchers.

*Adhering to the conservation measures will reduce any adverse impacts to southwestern willow flycatchers. Broad-scale treatments will only be conducted after a wildfire has destroyed potential southwestern willow flycatcher habitat. Although the southwestern willow flycatcher is typically known as a migratory species through the parks, if nests are found within and near park boundaries the NPS will coordinate with the FWS and UDWR to develop revegetation and restoration plans for the areas within 300 feet of identified nests. Therefore, implementation of the EPMP is not likely to adversely affect the southwest willow flycatcher."*



In **Section 4.6.11 Threatened, Endangered and Species of Concern, Impacts of Alternative 2**, page 194, changed text in **Summary** from "may effect not likely to adversely affect" to "will not contribute to listing".

In **Section 4.6.13 Archeological Resources**, page 200, delete the following text from **Methodology and Intensity Thresholds under negligible, minor, moderate**: "For purposes of §106, the determination would be *no adverse effect*."

In **Section 4.6.13 Archeological Resources**, page 201, delete the following text from **Methodology and Intensity Thresholds under major**: "For purposes of §106, the determination would be *adverse effect*."

In **Section 4.6.13 Archeological Resources**, page 201, insert additional *italized text* as follows under **Impacts of Alternative 1**: "Ground disturbing restoration or re-vegetation activities such as cultivation, raking, digging, and vehicle and foot traffic could potentially damage previously undiscovered archeological sites. *These types of activities would not be allowed within the boundaries of unsurveyed areas. The above activities would only be allowed within areas that have been surveyed and treatments performed only after park resource managers have inspected potential worksites, consulted with SHPO and appropriate mitigation strategies have been developed.*

Ground-disturbing activities, such as digging and pulling, could damage sensitive and fragile archeological sites. *Surface disturbing activities, such as digging, pulling, tilling or use of heavy equipment, will not be allowed within the boundary of identified and eligible archeological resources. Only handcutting of exotic vegetation and applying a basal chemical to stump will be permitted. Portable spraying allows for treatment of individual plants and the spray can be directed within an inch of the target plant. Exotic vegetation will be cut into manageable sizes and left. No ground disturbance will be permitted. No dragging material and building brush piles permitted.*

The potential short and long-term effects of herbicides on archeological resources made of various materials, such as wood and stone, are not well understood. Use of herbicides within the boundaries of archeological resources would be restricted. Because of unknown effects, herbicides would not be directly applied to rock art or archeological resources with sandstone grout, hearth features, or cultural resources comprised of organic material, bone, pollen, seeds, and materials made from plant fiber. Physical disturbance to archeological resources would be avoided. However, herbicides may be used in lands surrounding archeological resources in accordance with BMPs (page 71).

In **Section 4.6.13 Archeological Resources**, page 203, changed the following text from "are required" to "were modified":

In **Section 4.6.13 Archeological Resources**, page 203 delete *italized text* as follows under **Impacts of Alternative 2**: "*No mechanical/manual or chemical treatment will be done in the talus area. Only treatments can be conducted within the flats and along the river's edge.*"

In **Section 4.6.13 Archeological Resources**, page 203, insert additional *italicized text* as follows under Impacts of Alternative 2: "In addition to the BMPs in Section 2.3, the following additional BMPs will be implemented under this alternative *given that complete surveys have been conducted in the following areas*:

- *Only mechanical/manual, chemical and biological treatments can be conducted within the flats and along the river's edge.*

In **Section 4.6.14 Ethnographic Resources**, page 205, in **Methodology and Intensity Thresholds** inserted the following text: "*The Southeast Utah Group consulted with twenty seven Native American tribes with regard to the initial planning process of this EA/AEF. This consultation was to determine if the tribes had any ethnographic resources such as traditional plants or sacred sites that may be impacted by the proposed plan. Although during this planning process there were no responses regarding this impact topic, in previous planning documents, ARCH has identified Purple sage (Salvia leucophylla), in consultation with the Uinta and Ouray Ute, as an example of an ethnobotanical resource with traditional cultural significance and at HOVE, tribal representatives, through consultation, have identified the Hackberry spring which is associated with subsistence, religious, and ceremonial activities. The consulted Native American tribes also have an opportunity to review the complete EA/AEF during the public review process.*"

In **Section 4.6.14 Ethnographic Resources**, page 205, delete the following text from **Methodology and Intensity Thresholds under negligible, minor, moderate**: "For purposes of §106, the determination would be *no adverse effect*."

In **Section 4.6.14 Ethnographic Resources**, page 206, delete the following text from **Methodology and Intensity Thresholds under major**: "For purposes of §106, the determination would be *adverse effect*."

In **Section 4.6.14 Ethnographic Resources**, page 207, insert the following *italicized text* to the bottom paragraph: "It is expected that under Alternative 2 managers will have more flexibility in treating the most acres and most exotic species than under Alternative 1 and will be most effective and efficient in treating species that may threaten context and integrity of ethnographic resources in the parks. For example, under Alternative 2, additional BMPs would be implemented to minimize potential impacts of mechanical/ manual and chemical treatment to ethnographic resources. Only biocontrol methods would be use to minimize the potential for additional impacts to ethnographic resources. *Bio-control treatments are not ground disturbing and can be more of a natural process (no chemicals or mechanical treatment) to treat an exotic species.*"

In **Section 4.6.15 Historic Structures**, page 208, delete the following text from **Methodology and Intensity Thresholds under negligible, minor,**

**moderate:** "For purposes of §106, the determination would be *no adverse effect*."

In **Section 4.6.15 Historic Structures**, page 208, insert the following text: "*According to the NPS-28: Cultural Resource Management Guideline, "a historic structure is "a constructed work . . . consciously created to serve some human activity." Historic structures are usually immovable, although some have been relocated and others are mobile by design. They include buildings and monuments, dams, millraces and canals, nautical vessels, bridges, tunnels and roads, railroad locomotives, rolling stock and track, stockades and fences, defensive works, temple mounds and kivas, ruins of all structural types, and outdoor sculpture."*

In **Section 4.6.15 Historic Structures**, page 209, delete the following text from **Methodology and Intensity Thresholds under major:** "For purposes of §106, the determination would be *adverse effect*."

In **Section 4.6.15 Historic Structures**, page 210, under **Impact of Alternative 1**, insert the following *italized text* in second paragraph: "*Alteration of historic structures features would not be altered and the overall integrity of the resource will not be diminished since these areas would not be physically disturbed and since herbicides would not be directly applied to these structures. Negligible effects would occur on the historical nature of the built environment. This impact would not affect the character of features of any National Register eligible or listed historic structures or historic districts. The impacts of exotic plant management on historic structures would therefore be negligible, site-specific, and short-term.*"

On **Table 4-2, Assessment of Effect on Cultural Resources**, page 212, changed text from "AE" to "AEF" after consultation with Colorado State Historic Preservation Office and removed the Remarks column.