Finding of No Significant Impact
Post-Fire Aerial Application of Herbicide

In compliance with the National Environmental Policy Act (NEPA) the National Park Service (NPS) prepared an Environmental Assessment (EA) to examine the alternatives and environmental impacts associated with the aerial application of herbicides on lands burned in the 2007 Dakota Hill Fire Complex and the 2006 Kolob Fire.

PURPOSE AND NEED FOR THE ACTION

The purpose of the aerial application of herbicide analyzed in the EA is to contribute to the restoration of natural fire regimes and ecosystem processes in the areas burned inside Zion National Park (ZION) by the 2007 Dakota Hill Fire Complex. The EA also analyzed the impacts associated with re-treatment of some areas burned in the 2006 Kolob Fire. This action will further goals and desired future conditions identified in the General Management Plan (GMP) and Fire Management Plan (FMP):

- GMP Mission Goal: Maintain the resource, including plant and animal communities, at healthy and viable levels consistent with natural processes.
- FMP Goal: Prevent and suppress unwanted fires using effective strategies and methods under the decision process of sound risk management.
- FMP Desired future condition: Vegetation succession reflects the natural range of variability under conditions that would occur under historical fire regimes.
- FMP Desired future condition: Native wildlife habitat is maintained, restored, or enhanced through fire management practices that are consistent with natural processes.

The intent of the aerial application of herbicide is to interrupt the grass-fire cycle (Brooks et al. 2004, D'Antonio and Vitousek 1992) that is perpetuated by invasive annual grasses collectively referred to in this document as "cheatgrass," including *Bromus tectorum*, *Bromus rubens*, *Bromus diandrus*, and *Bromus japonicus*. Non-native cheatgrass increases in abundance and density after fire, resulting in increased fuel loads and fuel continuity, which in turn create a receptive environment for future fires. As cheatgrass continues to invade and increase after each fire, the time between fires becomes shorter. Since the native shrubs and trees are slower to re-establish after fire and need many years between fire events to complete their lifecycles, the increased fire frequency fueled by cheatgrass eventually eliminates most of the native shrubs and trees from the landscape. Cheatgrass also displaces the native grasses and herbaceous (non-woody) plants because as a winter annual, cheatgrass is able to establish earlier in the growing season than most native grasses and herbaceous plants. In this way, cheatgrass depletes soil moisture and competes against the native species until the native species are eventually crowded out of large areas as the grass-fire cycle continues. Similar to its effects on shrub and tree species, grasses and herbaceous species that are intolerant of frequent fire are eventually eliminated from the landscape by the fires carried by cheatgrass. As the grass-fire cycle is perpetuated, the fire frequency increases, eliminating native species adapted to longer fire return intervals.

A treatment is needed to interrupt the grass-fire cycle while there are still native plants and seeds in the area. This interruption should reduce cheatgrass establishment over a few growing seasons, allowing the native plants to successfully re-establish and persist in the burned area. The re-establishment of native vegetation will then restore habitat needed to support native wildlife and perpetuate natural ecosystem processes.

Action to interrupt the grass-fire cycle is being taken at this time in response to the 2007 Dakota Hill Complex and 2006 Kolob fires. The Dakota Hill Complex fire, ignited by lightning on July 15, 2007 burned a total of 9,112 acres, including 5,858 acres in ZION. The human-caused Kolob fire started on June 24, 2006 and burned a total of 17,632 acres, including 10,506 acres in ZION. The Kolob fire was the largest

fire in the park's history, and almost surpassed the total acres burned in the park since 1950. The vegetation in the burned areas for both fires primarily consists of pinyon-juniper woodland, ponderosa pine, mountain shrub, and shrublands. While there were many in-tact native plant communities in the burned areas prior to the fires, there were also populations of cheatgrass that served to carry the fire.

Dense stands of cheatgrass continue to persist immediately adjacent to the burned area on the Kolob fire, particularly to the north along the Kolob Terrace Road and along the west boundary of the park. The Dakota Complex experienced a mosaic burn. Cheatgrass was present in the understory of the pinyon/juniper and shrub canopies. The NPS is concerned that these seed sources, coupled with the cheatgrass seeds that remain in the soil in the burned area, would allow the cheatgrass to quickly re-establish and flourish in the burned area. Such an event would be highly detrimental to the recovery of native plants in the burned area and would result in long-term habitat degradation as the grass-fire cycle would gain in strength and persist for many years to come. The best opportunity to prevent the establishment of cheatgrass is in fall/winter of 2007/2008, when herbicides could be applied at a landscape level to prevent germination and growth of cheatgrass in the winter and early spring, thus allowing the native plants an opportunity to re-establish themselves in the burned area. For these reasons, ZION feels compelled to take action now to restore and preserve the natural vegetation communities in the areas burned in the Dakota Hill Complex and Kolob fires.

SELECTION OF THE PREFERRED ALTERNATIVE

The selected alternative (preferred alternative) is the aerial application of herbicide on up to 3,161 acres within the 2007 Dakota Hill Complex fire and a reapplication of herbicides on up to 6,739 acres burned in the 2006 Kolob fire (Refer to Figures A & B). The purpose of the herbicide application is to inhibit cheatgrass germination and growth, which will interrupt the grass-fire cycle and thereby restore native plant communities and wildlife habitat. The operational elements of the project are bulleted below for easy reference and are further elaborated in the following text.

- **Treatment areas:**
    - 2007 Dakota Hill Complex – treatment areas include those that burned at the highest intensity, areas that burned in the pinyon-juniper vegetation community, ½-mile corridor within the park along the east park boundary, and trail corridors totaling 3,161 acres if sprayed in fall. If the herbicide treatment occurs in spring the spray area will be reduced to 1,880 acres to avoid sensitive plant species. Treatment is identified to occur fall of 2007. Although treatment could occur in winter, spring or fall 2008 – subject to mitigation and environmental factors. Treatment could take up to 2 weeks to complete.
    - 2006 Kolob Fire – the re-treatment will focus on areas that have shown cheatgrass re-growth (over 20 percent cheatgrass cover) and could include up to 6,739 acres. Treatment is identified to take place anytime from November 1, 2007 through March 15, 2008. Treatment could take up to 2 weeks to complete.
    - The following will not be sprayed in either of the treatment areas: 300-feet either side of riparian corridors and surface water; within ½-mile of Mexican spotted owl protected area centers; and in areas where control plots will be established to monitor the effectiveness of the spray treatments.
- **Herbicides:** Imazapic, trade name Plateau®, is an herbicide that has been proven effective in cheatgrass control. Glyphosate, trade name Rascal®, will be added to the imazapic if cheatgrass has begun to grow. Glyphosate could also be used on it's own without imazapic. INDUCE®, a non-ionic surfactant, will also be added to the mixture. It is designed to quickly wet leaf and stem surfaces and to help spread a more uniform spray deposit over those surfaces.
- **Application method:** A helicopter that is specially equipped for herbicide application and operated by a pilot that is qualified for herbicide application will be used. All applicators will carry required credentials for the State of Utah and the Department of the Interior. The helicopter application equipment and flight patterns are designed to minimize spray drift.
- **Application rate:** For imazapic a maximum rate of up to 12 ounces per acre (probably 8 ounces per acre) will be used throughout the treatment area, with the exception of the no-spray areas. Glyphosate will be sprayed at a rate of no more than 16 ounces per acre. The recommended rate for INDUCE® is 6 ounces per acre.
- **Helicopter support area:** The Lava Point helispot will be used as the staging area for the Dakota Hill Complex treatment areas (East and West). The Coalpits helibase will be used as the staging area for the Kolob fire treatments. The Lava Point helispot is inside the park in a sagebrush

meadow near Lava Point. The Coalpits helibase is inside the park, with easy access to Highway 9 for fuel and water support. These two staging areas will serve as the base of operations where the herbicide will be mixed, and the helicopters will be loaded, fueled, and secured when not in use.

    - After completion of the aerial spray, the Lava Point helispot will be rehabilitated by: raking out all visible soil disturbance; rake in seed collected from the immediate area; scatter locally collected duff over seed; and monitor for non-native plant infestations for 3-years. If non-native plants are found they will be pulled, bagged, and disposed of in an appropriate receptacle. The helispot has been surveyed for cultural resources and none were found.

- **Timing of application:** Ideally the treatment will occur before cheatgrass greens up in late October or early November, but any date after October 15, 2007 will be considered based on weather conditions and the stage of plant growth. Although, application could occur in winter of 2007/2008, spring 2008 or fall 2008; these times would be subject to mitigation and other environmental factors.
- **Duration of treatment:** The treatment is expected to take approximately 2 weeks in each project area (Dakota & Kolob), depending on weather conditions that may affect actual hours of flight time per day.
- **Monitoring:** The results of the treatment will be scientifically monitored by researchers at Northern Arizona University and the U.S. Geological Survey to determine response of both cheatgrass and native plants in both treated and untreated areas.
- **Frequency of treatment:** For the Dakota Hill Complex, the area will be treated once initially, with the potential for follow-up treatments in subsequent years depending on what the monitoring results indicate will be most effective in restoring native plant communities. Monitoring results have shown that re-treatment for the Kolob area is appropriate this year.

Fall aerial herbicide application of imazapic/glyphosate is the best chance the park has of slowing an increase of cheatgrass in the area burned by the Dakota Hill Complex fires. As most of the burned areas had at least trace amounts of cheatgrass before the fire, it is expected with the increase nutrients and bare ground that cheatgrass could come to dominate much of the area post fire. There are native plant species in the burned area that can be expected to recover and flourish if the competition of cheatgrass is suppressed.

Research initiated by park staff, U.S. Geological Survey scientist Matt Brooks and Lake Mead Restoration Biologist, Curt Deuser with funding from Joint Fire Science examined the effects of fire, seed and imazapic (Louie et al. 2005). The treatments were initiated in the fall of 2005. Preliminary results show that fire followed by a fall season imazapic application was effective in reducing cheatgrass and allowing seed naturally found in the soil and seeded native perennials to occupy the site.

Imazapic is a non-restricted use herbicide that attacks a specific enzyme found only in plants to control growth (BASF 2004, BASF 2006). Imazapic is not mutagenic or teratatogenic and is not expected to have any adverse effect on big game and non-game species when used as labeled (BASF 2004, BASF 2006). It is considered to be nontoxic to mammals, birds, fish, and aquatic invertebrates (BASF 2006, BASF 2005). If ingested by mammals, imazapic is rapidly excreted in the urine and feces and does not bioaccumulate in animals. In addition to the acute toxicity and irritation studies conducted with imazapic show this product to be a nontoxic and nonirritating. The potential exposure to wildlife following a labeled application of imazapic is not expected to have any adverse effects. Imazapic is nontoxic to fish and aquatic vertebrates with a 96 hour LD_{50} (lethal dose for 50 percent of animals tested) value greater than 100 milligrams per liter (mg/l) (comparable to the toxicity of caffeine).

Glyphosate is a post-emergent broad-spectrum systemic herbicide that has no soil residual activity (Agriliance 2005). It is applied to foliage and is absorbed by leaves and drawn into root tissues. Glyphosate, N-(phosphonomethyl) glycine, is the herbicides active ingredient in the form of its isopropylamine salt, with no additional surfactant. Glyphosate does not appear to be mutagenic (Weed Science Society of America 1994), teratogenic (USEPA 1992), or carcinogenic (USEPA 1992). Glyphosate binds tightly to soil particles and is rapidly degraded by soil microbes, minimizing the opportunity for off-site contamination from soil movement. Acute and chronic toxicity to mammals is very low (USEPA 1992, Agriliance 2005). INDUCE® is a non-ionic surfactant that will be added to the mixture. It is designed to quickly wet leaf and stem surfaces and to help spread a more uniform spray deposit over

those surfaces. INDUCE® may cause gastrointestinal irritation if ingested in large quantities. It is also considered a moderate skin and eye irritant (HHC 2005).

The mobility of imazapic in soil is limited (BASF 2006) and glyphosate has no mobility in the soil (Agriliance 2005). Soil binding is a complex function of soil pH, texture and organic matter content. The binding of imazapic to soil has been observed to increase with time, while binding of glyphosate is very rapid. Imazapic and glyphosate have been shown to have little lateral movement in the soil. The major route of imazapic and glyphosate loss from the soil is through microbial degradation. Glyphosate generally biodegrades within 21 days and imazapic can remain viable in the soil for up to 3 years. From a total of nine soil dissipation studies conducted with imazapic, no residues were found below the 18-24 inch soil layer. After an application of imazapic, there is little potential for movement off the treated area and the same is true for glyphosate due to the chemical's tight binding nature to soil particles. Imazapic and glyphosate are not volatile and bind moderately to most soil types once applied.

Before any spraying begins, no-spray control plots will be established as part of the effectiveness monitoring protocol. Exact size and configuration of the control plots have not yet been determined, but will be scientifically valid with consideration of vegetation type, soil, burn severity, slope, and other environmental factors. The locations of these no-spray areas (stream corridors, control plots, and Mexican spotted owl protected areas) will be loaded into the helicopters computer system and the pilot will be able to navigate to avoid those areas during application.

During treatment, all aspects of the operation will be managed in compliance with all state laws and the chemical label requirements, including as worker and environmental safety precautions for chemical storage, mixing, and loading. The actual application rate will be measured and calibrated as needed to assure that the appropriate amount of chemical is applied per unit area of ground. The NPS will provide a certified Contracting Officers Technical Representative (COTR) to oversee the spray operation.

During treatment, the project areas will be closed to all users. This will include periodic closures of the Kolob Terrace Road and overlooks for short periods of time when the helicopter is operating in that corridor. These closures will also be implemented for the West Rim Trail corridor. Closures will be announced through normal channels, including press releases to local media outlets and bulletin boards in the park. Additionally, roadside signs will be posted along Kolob Terrace Road and in Virgin to announce the closures, as needed. Within the project area no permits for any backcountry use, including the Subway route and the West Rim Trail and associated backcountry routes, will be issued during the treatment period. Once the chemical is dried and the helicopter has left the area, the project area will be re-opened to all users.

OTHER ALTERNATIVES CONSIDERED

The other alternative analyzed in detail was the no action alternative (Alternative A). Under the no action alternative, the aerial application of herbicide would not occur and the park would continue with existing management actions in the burned area. Such actions could include spot treatment with herbicide using ground-based methods, replanting native species, and other actions to alter the vegetation community. However, since no aerial application of herbicide would occur, no large-scale efforts would be made to interrupt the grass-fire cycle at this time.

Over time the no action alternative would most likely lead to perpetuation of the grass-fire cycle. It is expected that cheatgrass would quickly re-invade the burned area, with dense stands of cheatgrass most likely to be established in the next few years along roads, trails, and the western and north eastern boundary of the park. Interior areas would not be spared cheatgrass invasion, but it would likely be slower to dominate due to fewer cheatgrass seeds in the soil and more competition from native plants. Over the next few decades, cheatgrass could come to dominate much of the burned area. In response to this increasing density of cheatgrass, fire frequency, fire size, and fire intensity would continue to increase, further accelerating the loss of native plant communities. While some native plants would continue to persist, eventually most of the native plant communities and their myriad wildlife habitats would be degraded and those communities that are intolerant of frequent fire would become absent from the landscape.

The resulting invasive grasslands are both created by increasing fire frequency, fire size, and fire intensity and serve to perpetuate large and frequent fires. The continuous fuels created by the invasive grasses

means that more ignition sources (i.e., lightning, cigarettes, vehicle sparks) would strike receptive fuels and start a fire. Furthermore, those continuous fuels also serve to carry the resulting fires over larger areas. Thus fires become larger and tend to spread faster as they carry through the light, flashy fuelbed formed by cured cheatgrass and its thatch layer. The increased frequency and size of fires would make it more difficult to control future fires and protect other values of concern from being burned, such as infrastructure, and natural and cultural resources.

Alternatives Considered and Dismissed

Ground-based widespread application only. Aerial application by helicopter is more accurate and precise in application rate than hand spraying. It is estimated that a helicopter can spray 50 acres per hour or about 600 acres per day (6 hours of flight time). The helicopter is recommended due to the ability to fly uneven, difficult terrain; ability to fly slower allowing for prescribed water volume, increased application and local landing and refilling ability. Under optimal conditions, a person can hand treat about 2 acres per day – taking into consideration the terrain, etc. With over 3,000 acres to be treated in the Dakota Hill burn and over 6,000 acres in Kolob burn, it would take a crew of 10 people over 450 days to complete the treatments. Such a prolonged treatment period would greatly reduce the effectiveness of the treatment and would increase impacts to resources due to the continual presence of human activity in the project area. For these reasons, it was determined that this alternative would not meet the purpose and need of the project and thus it was rejected as a viable alternative.

Spray all of Dakota Hill Complex. The Dakota Hill Complex fires burned in a mosaic fashion: 17 percent of the area within the fire perimeter was unburned, 23 percent of the area had a low soil burn severity, 48 percent of the area had a moderate soil burn severity, and 12 percent had a high soil burn severity. There are also many native species within perimeter that will re-sprout after fire and many unburned patches of native vegetation that could be damaged if sprayed. For these reasons, it was determined that an alternative to spray all of the areas burned in the fire would not meet the purpose and need of the project and thus it was rejected as a viable alternative.

Seeding – with or without herbicide treatments. We considered an alternative where only seed would be spread across the burned area and no herbicide would be applied to control cheatgrass. We also considered an alternative where the area would be sprayed with herbicide and then would be seeded.

Where cheatgrass is abundant or likely to become abundant, native plant seeds often fail to germinate or establish, and seeding alone does not necessarily decrease invasive species cover or may even reduce native perennial plant cover (Brooks 2005). Similarly, cheatgrass control is only effective when combined with treatments that establish perennial species (Harris and Goebel 1976, Klemmedson and Smith 1964, Mosley et al. 1999); or, in areas where there already is a significant component of native perennial plants present, chemicals can control cheatgrass (Mosley et al. 1999) and allow the native plants to grow. The plant composition of the burned area was carefully analyzed.

As much of the area burned have plants that are known to recover from fire either by sprouting or germination of seed, the park favors allowing the natural re-establishment of native plant communities. Furthermore, widespread seeding is very difficult due to the unavailability of large amounts of native seeds and that seed introduced from elsewhere, even if native species, may not reflect the genetic makeup of the plants found in the local area.

With the potential for seed failure due to cheatgrass competition, the infeasibility of finding adequate amounts of seed, and the potential for contamination of local genetics of native plant species, this alternative would most likely be unsuccessful in restoring native plant communities at a landscape level. For these reasons it was determined that seeding, with or without the herbicide spray, would not meet the purpose and need of the project and thus was rejected as a viable alternative.

ENVIRONMENTALLY PREFERRABLE ALTERNAITVE

The environmentally preferred alternative is determined by applying the criteria suggested in NEPA and further articulated in Council on Environmentally Quality (CEQ) guidance (1981). According to this guidance, “the environmentally preferred alternative is the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101.” That policy is to:

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
- achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Simply put, "this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources" (Question 6a in CEQ 1981). In the NPS, the no action alternative may also be considered in identifying the environmentally preferred alternative.

Alternative A represents no action to interrupt the grass-fire cycle. As a result, cheatgrass would continue to invade and fires would become more frequent. Under this scenario, many native plant communities would be reduced and habitat value would be degraded. This type of event could result in adverse affects to many of the park's resources and values.

The Proposed Action/Preferred Alternative, Alternative B, would use aerial application of herbicide to suppress cheatgrass emergence, thus allowing the native plants to successfully re-establish and persist in the burned area. The re-establishment of native vegetation would then restore habitat needed to support native wildlife and perpetuate natural ecosystem processes The Preferred Alternative as compared to current management/No Action Alternative would:

- Provide an environment dominated by native plant communities functioning within their natural fire regime.
- Reduce the risk to human health and safety and other undesirable consequences of frequent wildland fire.
- Improve the safety, healthfulness, and esthetics of the surroundings.
- Provide better protection of historic, cultural, and natural resources for succeeding generations.

Therefore, Alternative B, the Proposed Action/Preferred Alternative, would also be the environmentally preferred alternative.

MITIGATION MEASURES

The mitigation measures listed below are considered part of the selected action (preferred alternative) and will be followed during plan implementation. These actions were developed to lessen the potential for adverse impacts from implementing the preferred alternative, and have proven to be effective in reducing environmental impacts.

General

- A pre-project meeting and orientation will be conducted with the herbicide applicator prior to beginning field application including:
    - An aerial reconnaissance of area with pilot/applicator to ensure that s/he is familiar with topography and vegetation indicators of no-spray areas.
    - Test application with observers to determine the extent of drift. This information will be used to modify buffers, or change application parameters (such as droplet size or air speed) as needed to protect water resources and other areas that should not be sprayed.
    - Determine application patterns (grid vs. parallel to slopes and streams) best suited to avoiding no-spray areas.
    - An orientation to hazards to aircraft in the area.

Vegetation

- Use an application rate for imazapic of up to 12 ounces per acre (probably 8 ounces per acre) to maximize control of cheatgrass while minimizing non-target impacts to native species. Additionally

use an application rate for glyphosate of up to 16 ounces per acre after cheatgrass has emerged to kill cheatgrass while minimizing impacts to native plants. The recommended rate for INDUCE® is 6 ounces per acre.
- Use a fall application before green up or add glyphosate to the mix after green up to maximize control of cheatgrass while minimizing non-target impacts to native species.
- Protect riparian plants from herbicide injury by designation of no-spray areas.
- Establish control plots to monitor the effectiveness of the aerial herbicide treatment, and take follow-up action as appropriate based on lessons learned. Share findings with others.
- Conduct spot-treatments using ground-based herbicide application methods around roadsides and other areas to improve effectiveness of the aerial treatment.

Threatened, Endangered, and Sensitive Plant Species
- Monitor response of sensitive plant species in the project area.
- If spraying occurs in the spring all sensitive plant populations will be avoided.

Wildlife
- Protect riparian habitats from herbicide injury by designation of no-spray areas.
- Monitor the effectiveness of the aerial herbicide treatment using control plots, and take follow-up action as appropriate based on lessons learned. Share findings with others.

Threatened, Endangered, and Sensitive Animal Species
- Continue monitoring of Mexican spotted owls and peregrine falcons in the project areas.
- No-spray area within ½-mile of Mexican spotted owl protected area centers.
- Critical nesting and breeding times will be avoided (March 1 – August 31).
- Provide a treatment summary to the Utah Division of Wildlife Resources so that they can consider this treatment in their monitoring program for the flannelmouth sucker and the Virgin spinedace.

Natural Soundscapes
- Continue ambient sound monitoring in and near the project area.

Public Health and Safety
- Enact temporary public use closures during herbicide application treatment to protect people from overhead hazards and herbicide exposure.
- Restrict public access to the Coalpits helibase and Lava Point helispot while they are being used; which could include closing the road to the Lava Point lookout for up to 2-weeks.
- Follow standard aviation safety practices, such as flight following, air to ground communication, and identification of aviation hazards.
- Follow all herbicide label requirements and material safety data sheet recommendations for safe storage, handling, and application.
- Only federally registered herbicides will be used. Herbicides will be applied as per label instructions and restrictions.
- The intake operation of water for mixing will be arranged so that an air gap or reservoir will be placed between the live water intake and the mixing tank to prevent back flow or siphoning of chemical in to the water source.
- Avoid direct application of glyphosate to any body of water with the designation of no-spray areas. To minimize drift, application of all herbicides will be confined to periods when wind speed is less than 6 miles per hours. No application of herbicide may occur in drainages and valley floors when rain showers are imminent or likely within 12 hours.

Visitor Use and Experience
- Provide educational information to help the visiting public understand why the temporary public use closure is in effect during herbicide application. Provide information on alternative recreational opportunities in the park.
- For the Kolob treatment, road closure will be minimized as much as possible and could last up to 30 minutes at a time.
- For the Kolob treatment, the aerial spray will be planned to avoid impacts to hunters on nearby non-park lands.

WHY THE SELECTED ACTION (PREFERRED ALTERNAITVE) 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. These impacts are impacts that may have both beneficial and adverse aspects. Overall, these impacts may be adverse, and that on balance may be beneficial, but that may still have significant adverse impacts that require analysis in an environmental impact statement. No major adverse or beneficial impacts were identified that will require analysis in an environmental impact statement.

The selected action (preferred alternative) will have no or negligible beneficial or adverse impacts on air quality, archeological resources, historic structures, ethnographic resources, cultural landscapes, museum collections, economic considerations, lightscapes, park administration and facilities, ecological critical areas, floodplains, prime and unique farmlands, energy requirements, depletable resource requirements and conservation potential, environmental justice, and Indian trust resources.

The selected action (preferred alternative) will have no short-term impacts to threatened, endangered, or sensitive species of fish. All short-term impacts to health and safety will be mitigated. The selected action will have short-term, negligible, adverse impacts to Mexican spotted owls (action is outside protected activity area) and natural soundscapes in the frontcountry (due to helicopter activity during daylight hours). Short-term, minor, adverse impacts to vegetation (exposure of native plants to herbicide), wildlife (herbicide exposure and response to helicopter), soils (decreased soil productivity), visitor use and experience (area closures during project), and sensitive plant species (some plants may be inadvertently exposed to herbicide). Short-term negligible to minor adverse impacts could occur to water resources through the implementation of the selected action (preferred alternative). Short-term, moderate, adverse impacts to natural soundscapes in the backcountry and wilderness (from noise generated by the helicopter) could occur.

Long-term impacts will be minor and beneficial for natural soundscapes (both front and backcountry); threatened, endangered, and sensitive animals and their habitat; public health and safety; and visitor use and experience. This is due to the long-term restoration of natural fire regimes, which in turn reduces noise and area closures caused by wildland fire suppression activities. Long-term, moderate, beneficial impacts will occur to vegetation, sensitive plant species, wildlife, soils, water resources and wilderness due to the reestablishment of native plant communities that will stabilize soils, provide habitat and forage for wildlife.

Degree of effect on public health or safety. All short-term, negative impacts to public health and safety can be mitigated (refer to section on Mitigation). There would be long-term, minor positive impacts to public health and safety due to restoration of the natural fire regime and reduced exposure of the public, park neighbors, and firefighters to hazards associated with wildland fire and fire suppression activities.

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. As described in the environmental assessment floodplains, wetlands, prime and unique farmlands, historic sites, archeological sites, ecologically critical areas, wild and scenic rivers and other unique natural areas will not be affected. There are no known ethnographic, cultural landscapes or Indian trust resources identified in the project area that could be affected by the selected action (preferred alternative).

Degree to which effects on the quality of human environment are likely to be highly controversial. Initially the Town of Springdale expressed concerns about the effects of the herbicide on their culinary water supply. They also contacted the Utah Division of Drinking Water with their concerns. Zion National Park staff, the Town, and a representative from the Utah Department of Environmental Quality met to discuss the concerns. Through this coordination the concerns the Town of Springdale brought forward in scoping were addressed, thus alleviating controversial aspects of the project.

Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks. Initially the Town of Springdale expressed concerns about the effects of the herbicide on their culinary water supply. They also contacted the Utah Division of Drinking Water with their concerns. Zion National Park staff, the Town, and a representative from the Utah Department of Environmental Quality met to discuss the Towns concerns. This discussion led to additional research by all parties. The research found the likelihood of the herbicide affecting the culinary water supply was minute. Through this coordination any concerns about the unknown risks to the human environment from the implementation of the proposed action (preferred alternative) were alleviated.

Degree to which the action may establish a precedent for further actions with significant effects or represents a decision in principle about future consideration. The selected action (preferred alternative) neither establishes a National Park Service precedent for future actions with significant effects nor represents a decision in principle about a future consideration.

Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. The selected action (preferred alternative) of the environmental assessment analyzed impacts to vegetation; threatened, endangered and sensitive plant species; wildlife; threatened, endangered, and sensitive animal species; soils; water resources; natural soundscapes; wilderness; public health and safety; and visitor use and experience. As described in the environmental assessment, cumulative impacts were determined by combining the impacts of the alternatives with other past, present, and reasonably foreseeable future actions. Current and reasonably foreseeable future actions include:

Yellow Star Thistle Monitoring and Control. Over the next 3 years, park staff will monitor the burned areas, trails, and transportation corridors within the park associated with the Dakota Hill Complex fire for infestations of yellow star thistle, a winter annual. If plants are found they will be hand pulled and bagged. If large infestations are found, which is not likely, hand application of herbicides will be used according to NPS and herbicide label specifications. Any control will be conducted using Integrated Pest Management practices.

Sensitive Plant Monitoring and Control of Non-Native Species. Over the next 3 years known sensitive plant populations within the Dakota Hill Complex will be monitored to determine the effects of the fire and any treatments associated with the fire on these species. Their abundance and condition will be documented. Any non-native plant species in the vicinity of the sensitive plants will either be hand-pulled and bagged or if appropriate hand sprayed with an herbicide according to NPS and herbicide label specifications. Any control will be conducted using Integrated Pest Management practices.

East Boundary Fence Replacement. Almost 4-miles of fence along the east boundary of the park was damaged in the Dakota Hill East fire. The fence must be replaced to keep trespass livestock and recreational ATV users out of this area of the park. Much of the area along the fence was densely vegetated with oak brush, pinyon and juniper, and ponderosa pine prior to the fire. During the fire, extremely intense heat built up along the fence which resulted in much of the 36-inch woven wire being brought down. Most of the fence posts are metal and would not need replacement. Nearly all the woven wire observed is structurally sound and could be reattached to the T-posts. The double strand barbwire that was above the woven wire had been cut in several places prior to the fire and would be replaced. This project will be completed before the aerial spray.

Stabilization of Cabin Spring, Trail Reconstruction and Clearing, and Hazard Tree Removal. The Dakota Hill West fire removed most of the vegetative cover above Cabin Spring exposing the soil and increasing the potential for sediment movement during runoff events. Sediment would most likely fill the spring denying access to a critical water source for visitors and wildlife. Fire resulted in damage to the trail and campsites. Before the proposed aerial spray begins, crews will stabilize the area above the spring with jute fabric, place logs around the spring to divert water, replace waterbars on the trail, clear hazard trees, and reinstall direction and campsite signs.

Rehabilitation of the Lower West Rim Trail. Before the Dakota fire started, work had begun on the lower West Rim Trail from Little Siberia to the Virgin River foot bridge. Once the fire started work on the trail stopped. The trail work could resume at anytime time. The first phase of the work consisted of removing old trail cement and flying it out with a helicopter. The second phase of trail work will occur below the mouth of Refrigerator Canyon. This will include removing broken, excess material from the trail (old asphalt and cement) and resurfacing the trail with cement. The old excess material will be taken out by hand. The new cement will be poured using helicopter support. During helicopter operations and while the cement dries the trail will be closed to visitors.

Pine Valley Peak Prescribed Burn. The park has approved a 1,600 acre broadcast burn in the Pine Valley Peak area of the park – in the vicinity of the Wildcat Canyon Trail. The burn could happen anytime after February 1, 2007, subject to identified mitigation and the burn prescription. The fire would be started with drip torches, no helicopters would be used. This action will reduce hazardous fuels, reintroduce fire into the area, and provide boundary protection. Specific goals associated with this burn are to continue to

apply fire to the landscape thus maintaining the natural role fire plays in this ecosystem and maintain boundary protection by reducing excess hazardous fuels.

The selected action (preferred alternative), along with past, present, and reasonably foreseeable future actions, will have no significant cumulative effects on any resource analyzed in the EA.

Degree to which the action may adversely affect districts, sites, highways, structures, or other listed objects on the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources. There are known archeological sites and historic sites in the project area. The selected action (preferred alternative) does not require any surface disturbing activities and the act of flying a helicopter over these sites will have no effect on the sites and the herbicide will not affect the sites. There are no known cultural landscapes or ethnographic resources in the area.

Degree to which the action may adversely affect an endangered or threatened species or its critical habitat. There are no known Shivwits milkvetch populations within the Dakota Hill Complex treatment area. And since the geologic substrate that supports the species is very limited in the Kolob fire area selected for re-treatment, it is very unlikely that there are unknown populations of Shivwits milkvetch in the treatment area. Implementation of the selected action (preferred alternative) will have no effect on Shivwits milkvetch individual plants or populations. There are no actions identified in the selected action (preferred alternative) that occur in critical habitat and therefore will not alter any of the primary constituent elements. The selected action (preferred alternative) is not anticipated to diminish the contribution of the constituent elements of critical habitat for the recovery of Shivwits milkvetch. The implementation of selected action (preferred alternative) will not result in reduction or adverse modification for Shivwits milkvetch critical habitat.

Implementation of the selected action (preferred alternative) will occur outside the Mexican spotted owl critical breeding season and will occur outside any protected activity centers. Therefore, implementation of the selected action (preferred alternative) may affect, not likely to adversely affect Mexican spotted owls. The treatment identified in the selected action (preferred alternative) will have long-term benefits from improved habitat conditions, reduction of fire hazards, and prevention of cheatgrass-dominated systems. There are no identified actions that will alter any of the primary constituent elements and therefore the selected action (preferred alternative) is not anticipated to diminish the contribution of the constituent elements of critical habitat for the recovery of Mexican spotted owl. The implementation of the selected action (preferred alternative) will not result in reduction or adverse modification for Mexican spotted owl critical habitat.

The selected action (preferred alternative) is expected to provide long-term benefits to California condors from improved habitat conditions, reduction of fire hazards, and prevention of cheatgrass-dominated systems. Therefore, the implementation of the selected action (preferred alternative) may affect, not likely to adversely affect California condors.

The Virgin River chub and the woundfin do not occur in the park or immediately downstream, based on staff knowledge and past surveys. The Virgin River chub has the closest known distribution to the park (Virgin River below the town of LaVerkin – approximately 20 miles down stream from the park), but is far enough downstream that any water quality effects related to the selected action (preferred alternative) will be reduced with time and distance from the activity. Therefore, implementation of the selected action (preferred alternative) will not affect these species, resulting in a no effect determination.

Whether the action threatens a violation of Federal, state, or local environmental protection law. The selected action (preferred alternative) violates no federal, state or local environmental protection laws.

IMPAIRMENT OF PARK RESOURCES OR VALUES

The implementation of the selected alternative (preferred alternative) will not constitute an impairment of park resources or values. Impacts documented in the environmental assessment and summarized above will not affect resources or values key to the natural and cultural integrity of the park or alter opportunities for the enjoyment of the park. The selected action (preferred alternative) will not impair park resources and will not violate the NPS Organic Act. This conclusion is based on a thorough analysis of the impacts

described in the environmental assessment, the public comment received, and the professional judgment of the decision maker, in accordance with NPS Management Policies. As described in the environmental assessment, implementation of the selected action (preferred alternative) will not result in major adverse impacts to resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Zion National Park, (2) key to the natural or cultural integrity of the park, or (3) identified as a goal in the park's general management plan or other relevant NPS planning documents.

PUBLIC INVOLVEMENT AND AGENCY CONSULTATION

Scoping is an early and open process to determine the extent of environmental issues and alternatives to be addresses in an EA. ZION conducted both internal scoping with appropriate NPS staff and external scoping with the public and interested and affected groups, governments, and agencies.

Internal scoping, which included an interdisciplinary team of park staff, identified the purpose and need, identified potential actions to address the need, identified likely issues and impact topics, and identified the relationship of the proposed action to other park planning efforts.

A scoping letter was prepared and mailed to the public, federal and state agencies and interested groups on August 9, 2007. American Indian tribes traditionally associated with lands in ZION were also apprised of the proposed action on August 9, 2007. The scoping letter included a brief description of the proposed action and described opportunities for public participation. Scoping information was also posted on the park web site and the NPS Planning, Environment and Public Comment (PEPC) web site (http://parkplanning.nps.gov). A press release was issued by the park and published in local newspapers in August 2007.

Comments were solicited during external scoping until August 23, 2007. The park received three scoping comment letters. Two letters expressed concerns about the effects of herbicides on drinking water. This issue is addressed in this document as part of the proposed action and mitigation. The third letter did not identify any issues or concerns.

The environmental assessment was made available for public and agency review and comment from September 5, 2007 to October 5, 2007. Notice of availability of the environmental assessment was published in the local newspaper and notices were sent to interested public. The document was made available for review on the NPS Park Planning website, in local libraries, and at the park. Copies of the document were also sent to those who requested copies.

Two comment letters were received on the document. The letter from the Town of Springdale thanked us for our efforts in analyzing the proposed action for the potential of risk the Towns culinary water supply and also withdrew their initial objections to the proposed action. The second letter from the Utah Division of Drinking Water stated that "according to their rules we have no authority to offer an opinion on this issue."

Agency Consultation

In accordance with the Endangered Species Act of 1973 - Section 7, the park initiated consultation with the U.S. Fish and Wildlife Service in August 2007. In September the Service was sent the Biological Assessment and EA for review and comment. The Service concurred with our analysis and our effects determinations for protected plants and animals by a stamped letter dated September 10, 2007.

In accordance with the National Historic Preservation Act of 1966 (as amended) - Section 106 and 36 CFR 800, consultation was initiated with the Utah State Historic Preservation Office (SHPO) in August 2007. In September the SHPO was sent the EA for review and comment. The SHPO concurred with our determination of no effect to any cultural resource in a letter dated September 20, 2007.

In accordance with the National Historic Preservation Act, letters were sent to the following tribes: Goshute Indian Tribe, Hopi Tribe, Kaibab Paiute Tribe, Las Vegas Paiute Tribe, Moapa Band Paiute Tribe, Northern Ute Tribe, Paiute Indian Tribe of Utah, Pueblo of Zuni, Shivwits Paiute Band, Skull Valley Goshute Tribe, The Navajo Nation, and White Mesa Ute. The letters informed the tribes of the proposed action and asked for any comments or concerns. No comments were received.

CONCLUSION

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. Adverse environmental impacts that could occur are negligible to moderate in effect. There are no unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites or districts listed or eligible for listing in the National Register of Historic Places, known ethnographic resources, or other unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate ant federal, state, or local environmental protection law.

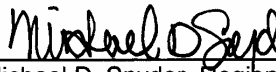
Based on the foregoing, it has been determined that the plan does not constitute a major federal action significantly affecting the quality of the human environment and an EIS will not be required for this plan and thus will not be prepared.

Recommended:

10/10/2007

Jock F. Whitworth , Superintendent — Date
Zion National Park

Approved:



10/10/07

Michael D. Snyder, Regional Director — Date
National Park Service, Intermountain Region