4.4 TERRESTRIAL RESOURCES

Terrestrial resources are divided into two sections: riparian vegetation and wildlife species.

Predicted impacts to riparian vegetation are based upon extensive riparian oriented field experience on other gravel and sand-bedded rivers in California. Specifically, considerable time has been spent studying riparian vegetation and relationships to hydrology and fluvial geomorphology on the Tuolumne River. While it is acknowledged that San Joaquin River, Merced River, and Stanislaus River terrestrial resources are inherently different than those of the Tuolumne River, due to land management practices, geology, and watershed size, after a field inspection of each river it was felt that the differences between rivers were not significant enough to warrant detailed independent comparisons of each. Instead, a prior understanding of the Tuolumne River riparian vegetation relationships to the physical environment was extrapolated to observations made on the San Joaquin River and its major tributaries (Merced and Stanislaus rivers).

Impacts to wildlife resources are based on changes in the quality of habitat as the result of loss or change of habitat. The changes in vegetation and resulting changes in terrestrial habitat are used as the measure of impacts on wildlife. The severity of impacts is determined by the magnitude of changes in quality or condition of terrestrial habitat and the potential for adversely affecting any threatened and endangered species (TES).

The habitat requirements of each TES wildlife species, as defined in the literature (CNDDB and WHR), were used to evaluate the effect of changes resulting from the proposed alternatives. It is assumed that the distribution and abundance of TES species is proportional to the amount and quality of habitat available. Assessment of impacts is based on the potential to impact TES species, their habitat, and/or their range. Although rare, threatened, and endangered plant species are known to live in the project area (Appendix D, Table D-2), field inspection within the riparian corridor has shown that no TES plant species live in the corridor and are all associated with non-riparian habitat types (Appendix D, Table D-1).

4.4.1 Key Impact Issues and Evaluation Criteria

4.4.1.1 Riparian Vegetation

Key impact issues for riparian vegetation are those that cause a positive or negative change to riparian vegetation health or survival. Where possible, impacts of stress are differentiated from impacts causing mortality to riparian vegetation.

Consistent with other sections in this chapter, impacts of the alternatives to riparian vegetation are assessed in terms of "significant impact", "potentially significant impact", "less than significant impact (if mitigated)", and "no impact." This section identifies specific impacts to riparian vegetation,

identifies specific thresholds of significance criteria for impact determination, assesses each alternative with respect to these significance criteria, and recommends measures to mitigate potential negative impacts. Conclusions relevant to CEQA and NEPA are the impacts of the two alternatives in comparison to the No Action alternative.

Potential Impact Types

Because riparian vegetation can both benefit from and be negatively impacted by the exact same process, many impacts of the alternatives can be positive, negative, or a mixture of both. For example, plant scour during excessively high flows can uproot all the riparian vegetation causing plant death. In most circumstances however, moderate amounts of plant scour result in positive impacts including preventing riparian encroachment, encouraging woody debris input and channel complexity, and cropping ecological succession so as to keep early seral stages in higher levels of productivity. In addition, riparian plants are negatively impacted by a variety of factors, including insufficient water availability during their growing season, and sand and silt deposition around the plant root collars (causing suffocation). The significance of the potential impacts not only has temporal aspects (depending on season and duration), but also magnitude/stage height aspects as well. The evaluation of the alternatives, combined with an understanding of riparian plant life history, narrowed down the range of potential impacts, as follows.

Potential positive impacts include:

- Improved natural riparian regeneration on surfaces at or near the bankfull channel/floodplain transition zones.

- Increased survival of established riparian vegetation.

- Slowing the decline in the health of relic stand riparian vegetation by increasing ground water availability.

- Improved natural riparian regeneration by timing pulse flows to coincide with seed dispersal periods of plant species whose populations are currently declining (e.g., Fremont cottonwood).

- Increased overall areal abundance in riparian vegetation in the project area.

Potential negative impacts include:

- Rapid downramping rates could cause stresses or mortality to riparian vegetation (due to desiccation or inundation). The summer Tuolumne flows, set by FERC, would always meet minimum flows, regardless of alternative.

- Increased abundance and/or areal extent of nuisance/exotic species (tree of heaven, eucalyptus, and other drought tolerant species with long lived seeds) due to flow timing not being correlated with native species seed dispersal periods.

- Encouraged growth of riparian encroachment along low flow channel margins (during dryer years) due to absence of high flows facilitates the initiation, establishment, and maturation of encroaching vegetation such as narrow-leaf willow, box elder, and white alder. This encroachment concurrently decreases riparian vegetation age and species diversity.

Perceived but not significant impacts include:

- Mortality to riparian vegetation due to recurring high flow scour events thus suppressing natural regeneration. Recommended flows, however, would not be of sufficient magnitude and frequency to cause this type of impact.

- The survival, regeneration, and bank location for each species. Due to magnitude and frequency of flows, this would change over current conditions.

Several components of the alternatives that could cause direct impacts to riparian vegetation include the magnitude of peak flows, the timing of high flows, and the ramping rates on ascending and descending limbs of high flows. Plant growth, germination, and establishment are periods during the plant's annual life history that have sensitivity to such changes and thus could potentially be impacted by the proposed alternatives (Figure 3.4-1).

Project alternatives would have little or no affect on riparian vegetation as long as the magnitude of peak flows does not exceed bed mobility thresholds (e.g., 7,000 to 8,000 cfs on the Tuolumne River). Consequently, impacts associated with flow timing are:

- Spring (March-May): Most riparian plants begin annual growth and flower during early spring; by late spring Fremont cottonwoods are dispersing their seeds (Figure 3.4-4). Initiating riparian seedlings are susceptible to mortality caused by downramping rates that exceed their root growing capabilities. April and May pulse flows for both alternatives begin and end during Fremont cottonwood's initiation period and would potentially impact this species. The alternatives having the most adverse impacts on riparian vegetation would occur during spring months.

- Summer (June-August): Riparian plants grow at their maximum potential during summer. Most riparian plants have finished seed dispersal, with the exception of narrowleaf willows (Figure 3.4-4). Stable summer flows experienced under No Action and the two alternative actions could potentially increase the encroachment of the invasive, narrowleaf willow. A long-term, cumulative indirect impact of low summer flows could be additional loss of riparian habitat due to enhanced encroachment by narrow-leaf willows (due to their long seed dispersal period).

- Fall (September-November): Riparian plants become dormant in the fall as valley oak, box elder, and white alder disperse seeds. Significant deviations in flows above or below the No Action alternative are not expected to have significant negative impacts.

- Winter (November-February): Riparian plants are dormant during winter. Flows of sufficient magnitude to induce bed mobility could scour establishing 1 and 2 year old plants. This could be either a positive or negative impact, depending on previous sequencing of scouring flows, however as long the magnitude of peak flows does not exceed bed mobility thresholds (e.g., 7,000 to 8,000 cfs on the Tuolumne River) no impacts are anticipated.

Many stress or mortality factors could cause negative impacts (Figure 3.4.4). By overlaying these mortality factors with life history trends, flow timing, magnitude, and ramping, impact thresholds can be developed above which significant impacts to riparian vegetation would likely occur. Stressors which could potentially create impacts (during times of year when vegetation is most susceptible) include:

- Desiccation - Decreases in soil moisture immediately adjacent to the channel caused by changes in groundwater levels resulting from rapid flow rampdown can cause water availability stress, reducing growth and potentially causing death. Several species can grow roots quickly to follow a decreasing wetted soil front, but not necessarily fast enough to prevent stress or death (Segelquist et al. 1993). This could be a primary impact on riparian vegetation.

- Inundation - Prolonged inundation during extended duration spring and summer high flows can drown vegetation. The mortality of vegetation within active channels could reduce encroachment of vegetation and enhance the deposition of fine sediments (positive impact). Conversely, inundation may prevent seed access to areas that could serve as germination sites. This could be a primary impact on riparian vegetation.

- Scour - One and two year-old riparian plants are most susceptible to scour mortality, because their roots are shallow and not well developed. Higher flows may mobilize silt, sand, and small gravel during winter peaks, scouring and killing newly established riparian vegetation.

Spring and summer flow magnitude and timing may impact mortality due to scour because flows during this window define where a given year's cohort initiates. Low flows during the seeding period coupled with seed establishment close to the low water edge, result in the potential for scour-related mortality during upcoming winter peak increases. If flows during the seeding period are higher, then riparian establishment would be occur higher on the channel margin, thus decreasing the potential for winter scour related mortality.

- Deposition - As flows recede following high flows, sand and silts deposition occurs. – Sediment deposition around the root collars of several riparian species (e.g., box elder, white alder) could suffocate vegetation if the deposits are deep enough (~ 0.5-1.0 feet deep). The significance of this secondary impact depends on the inundation impact on riparian regeneration.

Thresholds of Significance

Determining whether an alternative had a negative or positive impact on riparian vegetation depended upon how an alternative flow schedule interacted or impeded each species life history. The following thresholds of significance criteria were defined for determining potential impacts:

- Discharges during April 1-June 1 (spring) created potential impacts if:

  1. The magnitude and duration of flows are sufficient to inundate floodplains during seed dispersal period and initiation period, potentially creating a positive impact.

  2. Stage decreased at a rapid rate after May 1, primarily during flowramping, could potentially create a negative impact to germinating and establishing Fremont cottonwood seedlings.

  3. Stage increased during, or after, Fremont cottonwood seed dispersal period, drowning newly initiated plants could potentially create a negative impact.

- Discharges during June 1-Sept 30 (summer) created potential impacts if: Summer base flows were achieved by June 15 and did not have wide day to day variation over the three month period, thereby encouraging narrowleaf willow encroachment along the low water channel and potentially creating a negative impact.

- Discharges during October 1-March 31 (fall/winter) created potential impact if: Bedload mobilization thresholds were reached, discouraging narrowleaf willow encroachment, thereby potentially creating a positive impact.

4.4.1.2 Wildlife

Consistent with other sections, impacts of the three alternatives to wildlife species are assessed in terms of "significant impact", "potentially significant impact", "less than significant impact ", and "no impact." This section identifies impacts to wildlife habitat, identifies specific thresholds of significance criteria for impact determination, assesses each alternative with respect to these significance criteria, and recommends measures to mitigate potential negative impacts if needed. Impacts to wildlife, to a large extent, are reflected from changes in vegetation. Therefore, impacts to wildlife are closely tied to the vegetation impacts discussed above.

Those species associated with valley riparian communities are the ones most likely to be impacted as a result of the alternatives. Positive and negative impacts discussed in the vegetation section illustrate the range of potential impacts to wildlife habitat. Changes in vegetation and associated wildlife habitat may result in a shift of species presence within the riparian system, where some areas may see a reduction in quantity of riparian habitat and others are improved in the quality. Wildlife species most likely to be affected are those that rely on riparian habitat to fulfill several critical life requisites such as primary foraging or nesting habitat. In addition, those species that use riparian corridors to move throughout the region may also be positively or negatively, impacted depending on the resulting change or alteration in riparian vegetation.

The significance criteria for evaluation of impacts to wildlife resources are:

- Temporary or permanent removal, filling, grading, or disturbance of wetlands and riparian communities;

- Substantial decrease in the area of important wildlife habitats or use areas in the San Joaquin, Merced, Stanislaus, and Tuolumne river systems;

- Substantial fragmentation or isolation of wildlife habitats or movement corridors, especially riparian and wetland habitats;

- Loss of occupied TES species habitat or direct mortality of TES species;

- Reduction in area or habitat value of critical habitat areas designated under the federal Endangered Species Act.

4.4.2 Environmental Consequences

Potential impacts for the SJRA alternative and the Water Right Priority System alternative are compared to the No Action alternative and to the existing conditions described in Section 3.4.2. Each alternative was evaluated separately, and no comparison between the SJRA alternative and the Water Right Priority System alternative was made. Using the thresholds of significance criteria requires a shorter time-step (hourly or daily) than that provided by the simulation model (monthly). Because of differences in the temporal resolution of the model compared to plant life history, the SJRA alternative thresholds of significance were evaluated using flow data for water year 1993, (a wet water year class) and water year 1994 (a below normal water year class); prior years when pulse flows occurred on the Tuolumne River. The SJRA alternative was compared to water years 1972 and 1978, years that were similar in water year class but did not have pulse flows. Potential impacts identified by this analysis on the Tuolumne River are inferred to have occurred on the other tributaries as well.

4.4.2.1 Riparian Vegetation

No Action

Due to the combination of contemporary hydrologic and geomorphic processes, human disturbance, each riparian plant's specific physiologic tolerances, and the invasion of ruderal plants, no change to the current condition of a narrow riparian corridor with low species diversity described in Section 3.4.1 would occur. Plant communities would remain as described in the affected environment section. The threat of riparian encroachment by exotic species can increase in many of the tributaries as other channel restoration projects are implemented. Newly created alluvial surfaces that provide high quality salmonid habitat are vulnerable to riparian initiation and eventual encroachment. Preventing or avoiding narrowleaf willow encroachment is important in project areas where channel restoration has improved channel morphology (such as the Tuolumne River).

Proposed Action

The SJRA alternative simulates average monthly discharges using three models, and because of different modeling assumptions, the SJRA alternative was simulated for the months of April and May (instead of April 15- May 15).

One hydrograph for each water year class was generated for each modeled node in the project area (Figure 4.4-1 through Figure 4.4-25). The hydrographs portray the actual gaged discharges for that water year, the No Action alternative discharge simulation, the April pulse flow simulation and the May pulse flow simulation. If the flows for each alternative are equal for a given time period, the lines are superimposed and will appear as one thick line on the hydrograph. For example, on Figure 4.4-16 during the period of 1 February 1982 through 30 September 1982, all alternatives share the

same discharges for this time period. Therefore each alternative is superimposed over the others and accordingly only one line is visible. Evaluation of hydrograph components reveals that each simulated water year class has the potential to cross thresholds of significance.

Using the 1982 hydrograph on the Tuolumne River as an example (Figure 4.4-16), flows would no longer exceed bedload mobility thresholds during above normal and wet years. Increases in river stage after annual cottonwood seed dispersal (drowning seedlings), and rapid flow rampdowns (dessicating seedlings) could kill cottonwoods that germinated during pulse flows.

Due to the variability in modeled vs actual flows (10 percent to 20 percent) and the annual variability in flow magnitude (based on water year classification), the potential for impacts to riparian vegetation would vary in type and degree based on the actual timing and magnitude of flow release. Because the proposed flows were simulated by monthly timesteps, they cannot be quantitatively evaluated in terms of each threshold of significance criterion.

To assess the potential impacts associated with the proposed alternative in comparison to no action, Tuolumne River discharges during water years when pulse flows occurred were compared to years when they did not. Two locations were chosen for determining the rate of stage height change, at La Grange (modeled node LGR) and at the USGS gaging station #1129000, Modesto (Figures 4.4-26 through 4.4-29). The SJRA alternative stage height levels are shown using the annual daily average peak, pulse flow peak ,and summer minimum flows in context to vegetation transects near La Grange (Figures 4.4-30 and 4.4-31) and upstream of the Modesto node at Santa Fe road, river mile 22.5 (Figures 4.4-32 and 4.4-33) on the Tuolumne River.

The evaluation of water years 1993-94 Tuolumne River pulse flows, both at La Grange and Modesto, indicate that both the No Action and the SJRA alternatives crossed thresholds of significance. Potentially negative impacts in both alternatives were mainly limited to decreases in stage height after Fremont Cottonwood seed dispersal, stage height increases after Fremont Cottonwood seed dispersal (Figures 4.4-5, 4.4-7, 4.4-8, 4.4-9,4.4-10, 4.4-12, 4.4-14, 4.4-15, 4.4-16, 4.4-22, 4.4-23), and the elimination of bedload mobility thresholds (Figure 4.4-16, Figure 4.4-17 and Figures 4.4-26 through 4.4-29). Positive impacts in both alternatives were found associated with stage height increases and decreases during narrowleaf willow seed dispersal (Figure 4.4-26, Figure 4.4-27, Figure 4.4-29).

Specific potential impacts quantified for both the No Action and the SJRA alternative are:

- Pulse flow magnitudes are not sufficient to inundate floodplains during Fremont cottonwood seed dispersal (Figure 4.4-30 through Figure 4.4-33). For both water year classes, pulse flows reach stages that are contained within the active channel (Figure 4.4-30 through Figure 4.4-33).

- Modeled pulse flows have attenuated the annual peaks on the Tuolumne River such that bedload load mobility thresholds are not reached. When using prior water years data to

quantify potentially significant impacts, bedload mobility thresholds were not crossed even in the wet water year class (Figure 4.4-26 and Figure 4.4-27). The lack of semi-annual bed scour means that scour related mortality of prior years narrowleaf willow cohorts is not achieved in even wet water year classes. This could potentially lead to narrowleaf willow re-establishment on recently restored/constructed sites.

- Variation in summer baseflows are inadequate at La Grange during dry water years to inhibit narrowleaf willow regeneration but are adequate for wet water years (Figures 4.4-26 and 4.4-27); however, for both water year classes summer base flow variation at Modesto is sufficient to inhibit narrowleaf willow regeneration. There is no difference between the No Action alternative and the SJRA alternative for this threshold.

The proposed flows in the SJRA alternative would not impact any relic riparian vegetation; however, vegetation series that grow within the active channel (i.e., box elder, white alder, and willows) and germinating/establishing cottonwoods could potentially be impacted. Fremont cottonwood and valley oak stands that regenerated and established prior to flow regulation (relic stands) on the San Joaquin watershed would not be affected by any component of the proposed flows, as they are not currently influenced by contemporary fluvial processes that originally influenced where these plant series grew. No net loss to established box elder, and white alder cover types is anticipated, because they are infrequently inundated for any length of time greater than 1 day and currently are associated with the break in slope between the active channel and the floodplain.

In conclusion, no rare, threatened, or endangered plant species, and no relic vegetation types would be impacted (in comparison to no action); therefore, the negative impacts are not considered "significant". The SJRA alternative also would have some beneficial impacts to riparian vegetation related to stage height increases in dry years. For the few potential negative impacts associated with the SJRA alternative, they can be mitigated using the measures identified in Section 4.4.3.1. However, these measures are not required under CEQA but rather are recommended, since the impacts are less than significant.

Alternative Action

The evaluation of the Water Right Priority System alternative did not have PROSIM, SANJASIM, and STANMOD simulated flows available. The Water Right Priority System alternative was evaluated using flows from the *Draft Environmental Impact Report for implementation of the 1995 Bay/Delta Water Quality Control Plan* (SWRCB 1998), based on simulations using California Department of Water Resources Simulation (DWRSIM) model. DWR simulated discharges are published as a monthly average of a 73-year period of record, and consider only a ten-year "critical" period of drought as a "worst-case scenario".

The ten-year critical period was included because it simulates a drought when presumably pulse flow impacts on riparian vegetation would be the greatest. The evaluation of this alternative's impacts on riparian vegetation only considers the average period of record, and the ten-year critical period. As with the SJRA, the DWR simulated flows were monthly timesteps, and in addition, were not modeled for each individual year; a 73- or ten-year average was used. Because the DWR simulated flows in monthly time steps, it was assumed that the implementation of this alternative would be similar to the SJRA alternative; therefore, the impacts associated with the Water Right Priority System alternative would be similar to the SJRA alternative and are less than significant.

4.4.2.2 Wildlife

No Action

No change to the current condition is described in Affected Environment (Section 3.4.2).

Proposed Action

As discussed in the previous section, there may be impacts to riparian vegetation with resulting impacts to wildlife habitat. Wildlife species closely integrated with the riparian community may also be impacted, although impacts specific to individuals or groups are difficult to quantify. Those TES species that are most closely linked to riparian habitat (such as Swainson's hawk, willow flycatcher, riparian woodrat, and riparian brush rabbit) are likely to be the prime candidates for impacts. For example, loss of cottonwood forest may reduce the availability of nesting sites for Swainson's hawk. Likewise, shifts in vegetation structure due to encroachment of non-native plants may reduce the habitat value for riparian woodrat or riparian brush rabbit. These could affect TES species because there may be a resulting decrease in the area of important wildlife habitat, and there may be further fragmentation of riparian corridors along project rivers.

The proposed action would have little or no affect on riparian vegetation as long as the magnitude of peak flows does not exceed bed mobility thresholds (e.g., 7,000-8,000 cfs on the Tuolumne River). (Flows of this magnitude would exceed the VAMP target flows and would occur under No Action). As a result, there would be no loss of habitat value for TES species, and no impact on these species.

Alternative Action

The potential impacts to wildlife associated with the alternative action are similar to those discussed for the proposed action. Impacts under this alternative are likely to be reflected in changes or shifts in quantity and quality of riparian habitat. However, these changes are difficult to quantify. Impacts would result in shifts in wildlife species abundance and distribution. These shifts would be potentially significant impacts if there is a significant loss of important wildlife habitat on riparian corridors due to higher flows from the greater volume of water required for the Water Right Priority System

alternative. The impact on riparian habitat and species who depend on it are expected to be less than significant because a significant loss of riparian habitat is not expected.

4.4.3 Impact Summary and Mitigation of Impacts

4.4.3.1 Riparian Vegetation

Since impact evaluation was based on a surrogate model (the Tuolumne River data), mitigation measures are identified for riparian vegetation that might be impacted. Avoidance is the first step to mitigate potential impacts that could arise due to the timing of inundation, ramping rates, and bedload mobility threshold exceedence.

Impact avoidance criteria are equivalent to the thresholds of significance criteria. During the refinements in the actual operational scenarios for the proposed action, operation engineers may evaluate actual hourly and daily flow release possibilities and adjust them so they do not exceed the thresholds of significance criteria. Other impacts can be avoided as follows.

Proposed Action

- In the SJRA Alternative, the May pulse flow option is potentially the most detrimental, because in some years it could interfere with Fremont cottonwood initiation. Fremont cottonwood has been adversely impacted in the San Joaquin basin due to flow regulation, and rapid flow ramping at the end of the pulse flow would be more likely to kill seedlings that germinated during the May pulse flow period than if the pulse flow occurred in April. The modeled summer base flows reached immediately after the May pulse flow period may favor narrowleaf willow which is well known for its adverse impacts due to encroachment. Implementing the option in April, not May could mitigate these impacts. In both scenarios, summer baseflows should not exceed stage heights that were reached before May 15, because this could potentially drown Fremont cottonwood seedlings. The most likely implementation of this alternative would be for the pulse flows to begin in mid April accompanied by additional flows that would minimize rapid changes in stage (i.e., gradual flow ramping) during the receding limb. Flow ramping is part of the proposed action. If implemented to minimize large stage height change per day, impacts associated with flow ramping would be reduced. Therefore, it is recommended that a to-be-determined prescribed ramping rate be implemented in above normal and wet water year classes.

- The opportunity for riparian expansion will increase in many of the tributaries as channel restoration projects are implemented. Newly created alluvial surfaces that provide high quality salmonid habitat could be vulnerable to narrowleaf willow establishment and eventual encroachment. Preventing or avoiding narrowleaf willow encroachment will be important in project areas where channel restoration has improved channel morphology, such as the

Tuolumne River. Because of its propensity to fossilize the channel and reduce species and age diversity of riparian vegetation, narrowleaf willow dominance is undesirable. While the hydrographs of simulations of the above normal water years through the critically dry years show that the No Action and the SJRA Alternative propose stable summer base flows, on the Tuolumne River, static summer baseflows are already mandated by FERC. Where adequate soil moisture is present, stable summer flows could produce a large crop of narrowleaf willow seedlings in exposed areas. A small increase in flow in the first two weeks of August, immediately following narrowleaf willow's seed dispersal period, would minimize riparian encroachment by inundating surfaces where narrowleaf willow germinated and produce a beneficial effect on Fremont cottonwood seedlings. Inundating narrowleaf willow in early August would enhance inundation related mortality to new cohorts. If the April option of the SJRA alternative is chosen, this early August flow release should approach the stage height level of May 15, drowning narrowleaf willow seedlings while watering Fremont cottonwood seedlings on upper bar and floodplain surfaces.

- In conclusion, no rare, threatened, or endangered plant species, and no relic vegetation types would be impacted (in comparison to no action); therefore, the negative impacts are not considered "significant". The SJRA alternative also would have some beneficial impacts to riparian vegetation.

Alternative Action

- Impacts to Fremont cottonwood would be similar to the proposed action. Water provided for ramping flows would mitigate potential impacts to less than significant.

- The Water Right Priority System would also be based on FERC mandated flows in the Tuolumne River. Similar increases in stage (such as those recommended for the SJRA alternative) would prevent encroachment at restoration sites, and would mitigate to less than significant the effects of summer baseflows in these areas.

4.4.3.2 Wildlife

Proposed Action

- Ramping flows and the April pulse flow would result in reducing potential impacts on TES wildlife species by reducing loss of important wildlife habitat and decreasing the potential for fragmentation of riparian corridors. In addition, the FERC mandated flows on the Tuolumne (assumed in both No Action and SJRA alternatives) would reduce encroachment of exotic plant species in the project area and enhance habitat quality for endemic wildlife, including TES species. The impacts to wildlife, especially TES species, would be less than significant.

Alternative Action

- Impacts to the riparian corridor would be similar to those described in the proposed action. The alternative action would result in less-than-significant impacts to wildlife, including TES species.