

March 14, 2017

WATERSHEDS SECTOR

RECOMMENDATIONS TO THE COUNTY OF KAUAI PLANNING DEPARTMENT FOR INCLUSION IN THE GENERAL PLAN 2020-2035

The Draft General Plan is missing information for the MIDDLE WATERSHEDS areas of Kauai. This is an important section of the ahupua'a, for it is in the Middle Watershed that the following activities take place:

- 1) Agriculture/Crop Production
- 2) Tree Plantations
- 3) Timber Harvesting
- 4) Ranching/Grazing
- 5) Watershed Diversions
- 6) Recreation, some examples hunting, ditch tubing, hiking, zip-lining, horseback riding
- 7) Road Construction/Reconstruction
- 8) Stormwater Run-off
- 9) Invasive Species

What are the Impacts to the Watershed that can occur with these activities?

Activity Related to	Impacts on Environment	Impacts on Ecosystems	Impacts on Human Health & Welfare	BMPs and Other Management Actions
Agriculture/ Crop Production	Land clearing Native vegeta- tion loss Soil exposure, erosion Fertilizers, pest icides added to ecosystem Groundwater loss Higher surface run-off New species introduced <i>Sedimentation run-off</i>	Increased run- off impacting coasts Native habitat & species loss Pesticides enter food chain	Loss of domes- tic water Loss of subsist- ence Loss of recrea- tion Loss of shore & reef access Increase in air- borne dust Health effects of herbicide/ pesticide sprays	Utilize water conservation Buffers around sensitive areas Terraced farming Use of native plants for culti- cation Utilize integrated pest mgmt actions, reducing pesti- cide use: con- trol timing & efficiency of application Control back- flow into water supplies

Activity Related to	Impacts on Environment	Impacts on Ecosystems	Impacts on Human Health & Welfare	BMPs and Other Management Actions
Tree Plantations	Removal of old growth Soil exposure, erosion Water retention loss High surface run-off Sedimentation run-off Groundwater loss New species introduced	Loss of native habitat Loss of native species Increased discharge downstream Coastal & marine losses of habitat & species	Subsistence losses Tourism loss Recreational loss Fishery loss Loss of domestic water	Buffers around sensitive areas & replanting Restoration of lands Contour framing, terracing Use of native plants Water conservation measures Reduce/eliminate pesticides Avoid aerial sprays

Timber Harvesting

ENVIRONMENTAL IMPACTS are:

- Removal of old growth
- Soil exposure and erosion
- Water retention loss
- Groundwater loss
- High surface run-off
- Sedimentation run-off
- New exotic species

ECOSYSTEMS IMPACTS are:

- Loss of native habitat
- Loss of native species
- Increased discharge downstream
- Coastal and marine losses of habitat and species

IMPACTS ON HUMAN HEALTH AND WELFARE are:

- Subsistence loss
- Tourism loss
- Recreational loss
- Scenic loss
- Fishery loss
- Loss of domestic water

BEST MANAGEMENT PRACTICES & OTHER MANAGEMENT ACTIONS are:

- Selective harvest, avoiding clear cutting
- Old growth protects watersheds
- Water conservation measures

Soil conservation measures

Buffers around sensitive areas.

Restoration and replanting

Reduce/eliminate herbicide/pesticide use; avoid aerial spray

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Activity Related to	Impacts on Environment	Impacts on Ecosystems	Impacts on Human Health & Welfare	BMPs and Other Management Actions
Ranching/ Grazing	Loss of water quality Loss of ground cover Soil exposure, erosion Sedimentation pollution & animal waste New animals introduced	Animal waste pollution in coastal waters Heavy sedimentation to coastal waters	Subsistence losses Recreational gains & losses Tourism gains & losses Public health hazards	Protect sensitive areas from physical impact Install fencing to protect streams from animals Control direct loading of animal waste & sediment Carrying capacity controls for livestock
Watershed Diversions	Hydrology changes Loss of surface & ground water Water loss to streams, rivers, ponds, lo'i Impairment of stream resources Reduction of streams' capacity to assimilate pollutants Loss of existing stream uses	Wildlife losses Endangered species loss Ex: Newcombe Snail Loss of native habitat, native species Increased discharge downstream Coastal & marine loss of habitat & species Sedimentary materials & fill impact reefs, corals	Violation of Constitutionally protected Public Trust rights of Hawaiians & All Residents Ola I Ka Wai: Loss of connectivity of water and mana from summit pool (realm of Wao Akua) to ocean (realm of Wao Kanaka) Health, Soul, Spirit Effects Loss of cultural religious & gathering rights for Native Hawaiians, others	

Environmental Impacts Ecosystems Impacts Human Health and Welfare Impacts Best Management Practices

Watershed Diversions (continued)			Subsistence losses Tourism loss Loss of natural beauty Water recreational loss Fishery loss Rise in cost of water Loss of agriculture Cultural heritage loss Loss of domestic water	p. 7 State CWRM and County of Kaua'i partner to designate NF Wailua River to Huleia River a Water Mgmt Area. Conduct watershed flow studies Return rightful flow to NF Wailua, SF Wailua, and various streams
Recreation— Ex: hunting, ditch tubing, hiking, zip-lining, horseback riding	Trash/litter pollution Emissions from trucks, vans, tour vehicles Exhaust emissions Sedimentation pollution runoff may include sewage waste	Degraded water quality Degraded air quality Toxicity to species Habitat loss Land cover changes	Public health risk Aesthetic loss Clean-up costs Employment of residents Exposure to different cultures, values Lifestyle changes	Litter disposal Waste mgmt education & outreach Public education Employee training

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Activity Related to	Impacts on Environment	Impacts on Ecosystems	Impacts on Human Health & Welfare	BMPs and Other Management Actions
Road Construction/ Reconstruction	Conversion to open lands Sedimentation pollution runoff from erosion & surfacing Machinery emissions—gas oil, solvent drip pings, spills Structural changes to land scape	Loss of native habitat Loss of native species Increased discharge due to surface run-off Degraded water quality Increased land slippage	Cultural resource loss Subsistence loss Tourism losses Recreational losses Fishery loss Economic loss	Construct roads well away from streams, rivers, drainage berms, settling basins Develop road system design to reduce generating sediment Utilize proper drainage Install proper stream crossing
Stormwater Run-off	All the Environmental Impacts above weigh in here	Impairment of stream resources Reduction of streams' capacity to assimilate pollutants (could include sewage waste) Degraded ecosystem Degraded water quality Loss of aquatic species	Property loss as erosion continues Spread of disease if storm water contains sewage (enterococcus bacterial concentration)	Restore streams and river channels Treat storm-water @treatment plants Install sediment traps in storm drains Install rain gardens, rain barrels Construct porous pavement

Invasive Species	Can spread thru watershed action & diversion action Introduction of invasive species	Loss of native species Introduction of predators & parasites Reduced genetic variability of wild population	Reduction in subsistence food supplies Recreational losses	Require using native species Strict guide-lines on entry & quarantine of exotic species
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 Sharon Goodwin
 Wailua Homestead