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Pest species

Risks due to pest species introductions can be minimised through comprehensive environmental assessment and identification of avoidance, mitigation or management options.

Issue

In some regions a significant long-term issue with reservoirs, irrespective of their use, can be the introduction or enhancement of exotic or native pest species. The change in environment caused by storage creation can result in advantageous colonisation by species that are suited to the new conditions, and these may result in additional biological, social and/or economic impacts.

Pest fauna species can have major impacts on waterways and their biota in the reservoirs and downstream, by directly preying on native species, or over-consuming the food and habitat supply for the natives. In the downstream river systems major insect population blooms can occur, particularly for species naturally controlled by dessication, where the regulated river provides higher than natural year round flows.

Pest flora species can occur within the reservoir, and in some instances proliferation may interfere with power generation (eg. clogging of intake structures) or downstream water use through changes in the quality of discharge water (eg algal bloom toxins, deoxygenated water). Floating aquatic vegetation can have impacts on faunal species due to habitat degradation, and for public health by providing improved breeding grounds for mosquitos or other disease vectors. Pest flora species in the downstream river system can successfully establish where modification of flooding regimes and loss of flushing flows provide suitable conditions. Where schemes have diverted water out of a river system, weed species can invade areas of sediment accumulation and become solidly established.

Management

Identifying the risk of infestation prior to development, through a comprehensive environmental assessment, will assist in identifying potential options for avoidance, future management or mitigation. Even the best siting and design options, however, cannot control post-operational weed introductions. A number of approaches have been applied at different stages of scheme development and operation to address pest species risks and problems.

For reservoir weed problems, pre-impoundment selective forest clearing can make reservoirs less conducive to weed growth. Pollution control, particularly for nutrient rich streams such as sewage treatment plants or fish processing plants, can be important in some cases. A range of techniques can be effectively employed for physical removal or containment, but with high ongoing costs. Chemical poisoning of pest species is an option but only in extreme cases with considerable environmental caution. In terms of within reservoir water management techniques, shorter residence times or creating better circulation through strategically placed barriers can be of assistance. Drawdown of reservoir water levels may also be employed, although again with caution as the implications for reservoir biodiversity and shoreline stability need to be carefully considered.

For downstream pest species issues, flushing flows can be considered to address invasion of floral species into the river channel, or concentrated removal efforts which can be accompanied by replanting of native species. Strategically placed and purpose-designed barriers may be required for faunal pest species to restrict their range – these may include anti-jump screens, or even creating local flow velocity barriers. Efforts to enhance conditions for native species, such as through environmental flows, can help reduce their vulnerability to pest species domination.