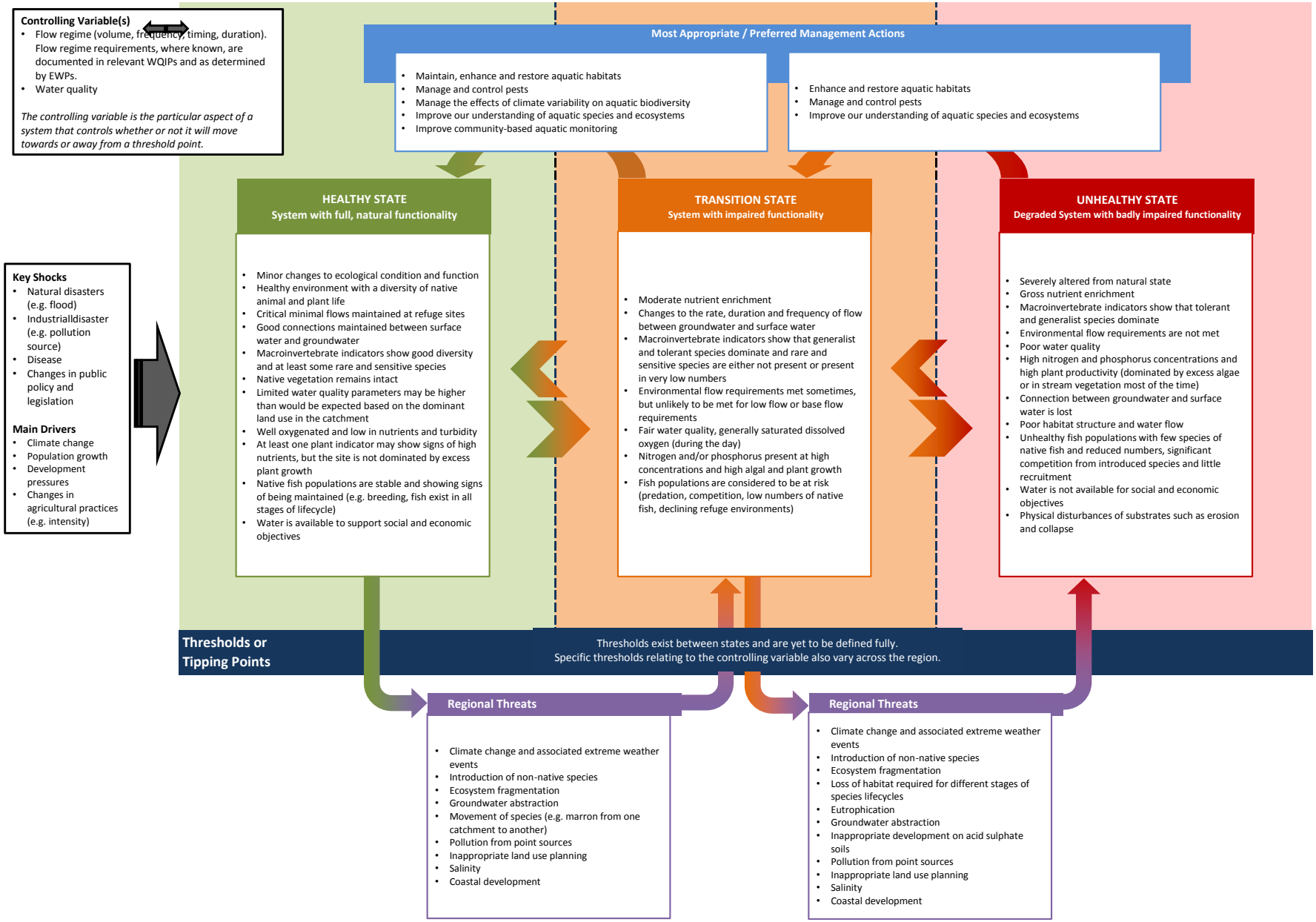
Controlling Variable(s)
Flow regime (volume, frequency, timing, duration). Flow regime requirements, where known, are documented in relevant WQIPs and as determined by EWPs.
Water quality
The controlling variable is the particular aspect of a system that controls whether or not it will move towards or away from a threshold point.
Key Shocks
Natural disasters (e.g. flood)
Industrialdisaster (e.g. pollution source)
Disease
Changes in public policy and legislation
Main Drivers
Climate change
Population growth
Development pressures
Changes in agricultural practices (e.g. intensity)
Most Appropriate / Preferred Management Actions
Maintain, enhance and restore aquatic habitats
Manage and control pests
Manage the effects of climate variability on aquatic biodiversity
Improve our understanding of aquatic species and ecosystems
Improve community-based aquatic monitoring
Enhance and restore aquatic habitats
Manage and control pests
Improve our understanding of aquatic species and ecosystems
HEALTHY STATE
System with full, natural functionality
Minor changes to ecological condition and function
Healthy environment with a diversity of native animal and plant life
Critical minimal flows maintained at refuge sites
Good connections maintained between surface water and groundwater
Macroinvertebrate indicators show good diversity and at least some rare and sensitive species
Native vegetation remains intact
Limited water quality parameters may be higher than would be expected based on the dominant land use in the catchment
Well oxygenated and low in nutrients and turbidity
At least one plant indicator may show signs of high nutrients, but the site is not dominated by excess plant growth
Native fish populations are stable and showing signs of being maintained (e.g. breeding, fish exist in all stages of lifecycle)
Water is available to support social and economic objectives
TRANSITION STATE
System with impaired functionality
Moderate nutrient enrichment
Changes to the rate, duration and frequency of flow between groundwater and surface water
Macroinvertebrate indicators show that generalist and tolerant species dominate and rare and sensitive species are either not present or present in very low numbers
Environmental flow requirements met sometimes, but unlikely to be met for low flow or base flow requirements
Fair water quality, generally saturated dissolved oxygen (during the day)
Nitrogen and/or phosphorus present at high concentrations and high algal and plant growth
Fish populations are considered to be at risk (predation, competition, low numbers of native fish, declining refuge environments)
UNHEALTHY STATE
Degraded System with badly impaired functionality
Severely altered from natural state
Gross nutrient enrichment
Macroinvertebrate indicators show that tolerant and generalist species dominate
Environmental flow requirements are not met
Poor water quality
High nitrogen and phosphorus concentrations and high plant productivity (dominated by excess algae or in stream vegetation most of the time)
Connection between groundwater and surface water is lost
Poor habitat structure and water flow
Unhealthy fish populations with few species of native fish and reduced numbers, significant competition from introduced species and little recruitment
Water is not available for social and economic objectives
Physical disturbances of substrates such as erosion and collapse
Thresholds or Tipping Points
Thresholds exist between states and are yet to be defined fully.
Specific thresholds relating to the controlling variable also vary across the region.
Regional Threats
Climate change and associated extreme weather events
Introduction of non-native species
Ecosystem fragmentation
Groundwater abstraction
Movement of species (e.g. marron from one catchment to another)
Pollution from point sources
Inappropriate land use planning
Salinity
Coastal development
Regional Threats
Climate change and associated extreme weather events
Introduction of non-native species
Ecosystem fragmentation
Loss of habitat required for different stages of species lifecycles
Eutrophication
Groundwater abstraction
Inappropriate development on acid sulphate soils
Pollution from point sources
Inappropriate land use planning
Salinity
Coastal development