



DEPARTMENT of  
PRIMARY INDUSTRIES,  
WATER *and* ENVIRONMENT



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## **Water Quality of Rivers in the Inglis – Flowerdale Catchment**

### **PART 3i**

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**Hydro Tasmania**  
*the renewable energy business*

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The Department of Primary Industries, Water and Environment provides leadership in the sustainable management and development of Tasmania's resources. The Mission of the Department is to advance Tasmania's prosperity through the sustainable development of our natural resources and the conservation of our natural and cultural heritage for the future.

The Water Resources Division provides a focus for water management and water development in Tasmania through a diverse range of functions including the design of policy and regulatory frameworks to ensure sustainable use of the surface water and groundwater resources; monitoring, assessment and reporting on the condition of the State's freshwater resources; facilitation of infrastructure development projects to ensure the efficient and sustainable supply of water; and implementation of the *Water Management Act 1999*, related legislation and the State Water Development Plan.

### 3.5 Catchment Surveys

Snapshot surveys of the entire drainage system of the Inglis-Flowerdale catchment (including Seabrook and Camp Creeks) were undertaken in the summer (March) and winter (August) of 2000. While all of these sites were monitored monthly under the normal sampling regime, only a subset of the 27 catchment sites were normally sampled for comprehensive analysis. During the catchment snapshots, the entire suite of chemical parameters were examined.

The March 2000 survey was carried out during low, stable baseflow, when flow in the lower Inglis River was around 0.8 cumecs and rainfall had not occurred in the catchment for more than 10 days. The winter survey was conducted in August when flow in the Inglis River was approximately 5 cumecs. While this winter snapshot was undertaken during reasonably stable baseflow, typical winter rainfall for the region meant that there had been several small events in the river (<15 cumecs) in the few weeks preceding the survey.

The aim of the following maps is to give a much broader view of water quality across the catchment. The discussion will focus on those parameters not normally sampled during routine monthly monitoring at the full set of sites. Data collected on the more common physico-chemical parameters (ie turbidity, dissolved oxygen, pH, etc) was presented and discussed earlier in Section 3.1.

#### 3.5.1 Catchment Surveys - Nitrogen

Nitrate nitrogen ( $\text{NO}_3\text{-N}$ ) concentration at all 27 sites was markedly higher during the winter survey, providing further evidence that winter rainfall ‘flushes’ residual  $\text{NO}_3\text{-N}$  from the soil profile and causes higher  $\text{NO}_3\text{-N}$  concentrations in waterways. Concentrations throughout most of the catchment during the summer survey (Figure 3.21) were generally within the range 0.005-0.10 mg/L, which is well below the ANZECC 2000 trigger level (0.190 mg/L) for moderately disturbed Tasmanian upland river systems, but around the 0.04 mg/L trigger level for lowland rivers. Highest concentrations were recorded at IF15 (Blackfish at Lowries) and IF27 (upper site on Camp Creek), which had  $\text{NO}_3\text{-N}$  concentrations of 0.470 mg/L and 0.708 mg/L respectively.

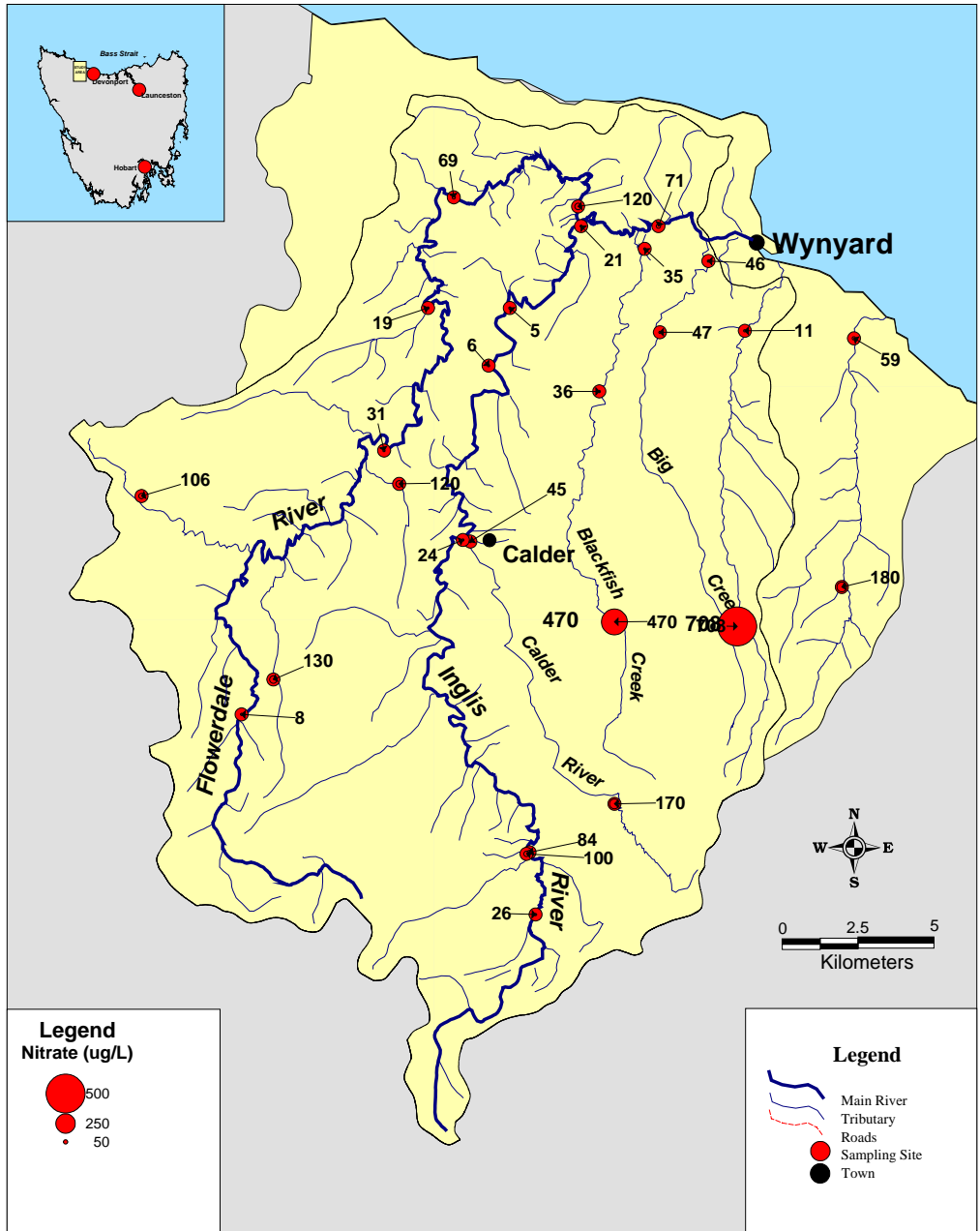
While IF15 and IF27 also had very high concentrations during the winter survey (0.605 and 1.06 mg/L respectively),  $\text{NO}_3\text{-N}$  concentration at almost all the other sites (Figure 3.22) was about ten times higher than what was recorded during the summer. During the winter catchment survey  $\text{NO}_3\text{-N}$  concentration at 20 of the 27 sites was found to be in excess of the upland river trigger level (0.19 mg/L), and all exceeded the trigger level for lowland rivers in Tasmania (0.04 mg/L).

Ammonia nitrogen also showed some seasonal change, with generally higher concentrations recorded during the summer survey (Figure 3.23). Although levels in excess of 0.05 mg/L were found at 11 sites in the catchment (including IF3, IF4, IF19, IF23 and at IF26), these levels were much lower than those measured in the Duck and Montagu catchments and do not pose any environmental threat. The high concentration of  $\text{NH}_3\text{-N}$  recorded at IF23 (Hebe River) was unexpected, given the essentially ‘pristine’ nature of the catchment upstream from the sampling site. However this may have something to do with the buttongrass swamp upstream, and the soil underlying this area, which is likely to be organic-rich and have peaty characteristics.

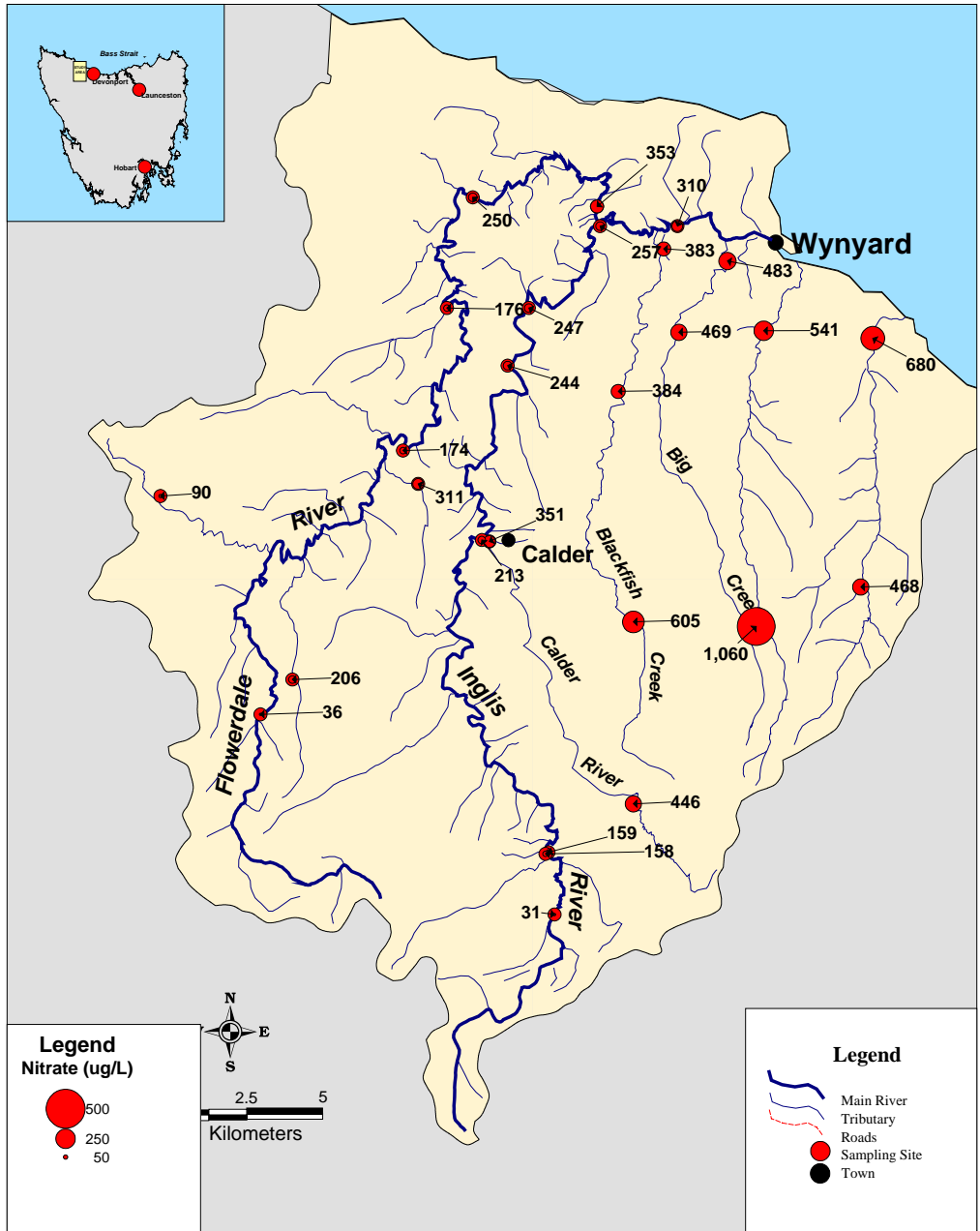
Only the results from the summer survey are presented, as the pattern for winter was very similar. Concentrations of  $\text{NH}_3\text{-N}$  across the catchment were generally lower during the winter, with only 4 sites having a concentration above 0.02 mg/L.

The concentrations of TN recorded during the catchment surveys tend to reflect the influence of the very large changes in dissolved nitrates present in the waterways, with larger TN

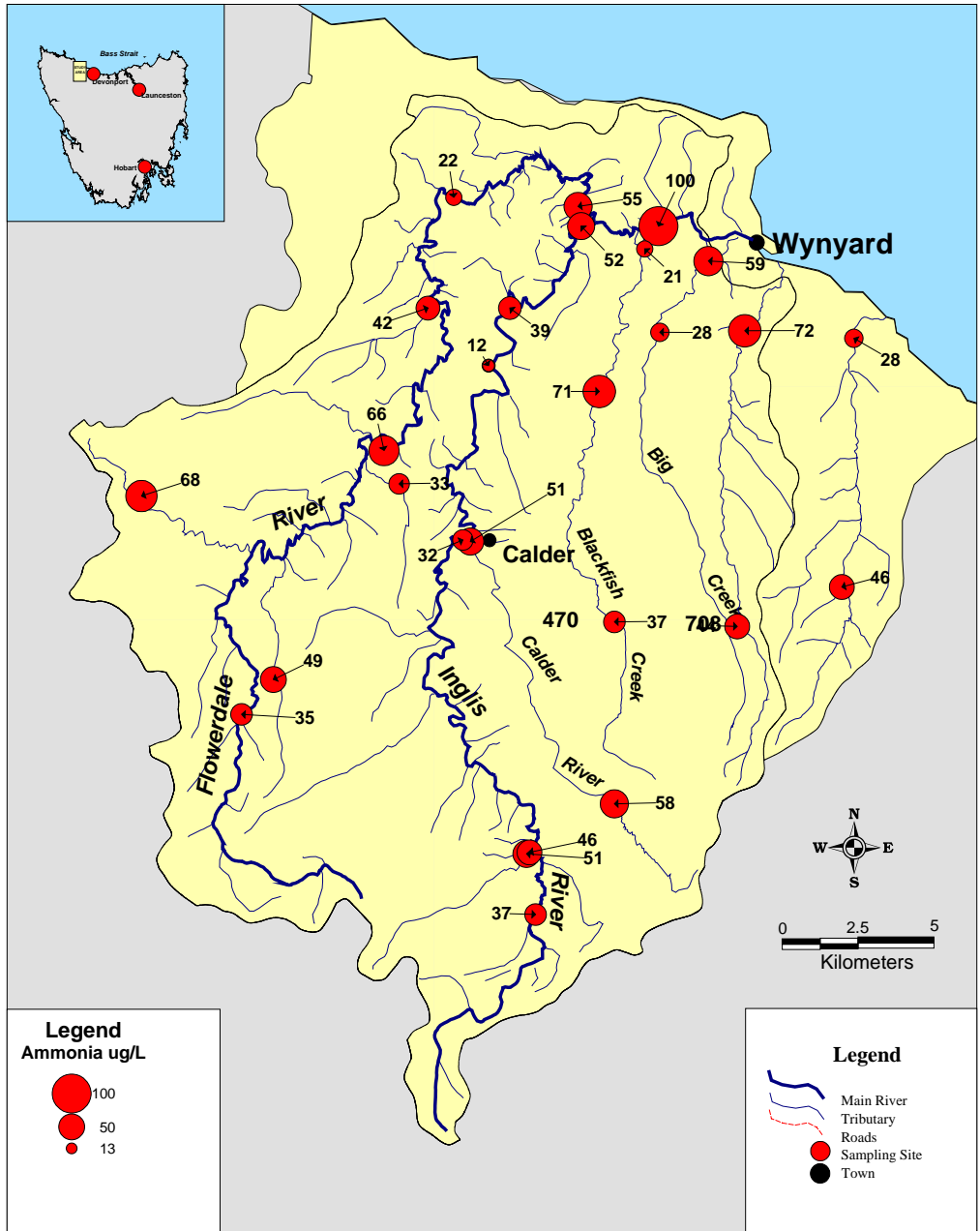
concentrations recorded at all sites during the winter (Figure 3.25). Sites on the eastern side of the catchment (in the lower Inglis River, Blackfish Creek, Camp Creek, Seabrook Creek and the upper Calder River) all had higher TN concentrations than at sites on the western side (with the exception of Hebe River). Sixteen of the 27 sites tested during the winter survey had TN concentrations exceeding the 0.5 mg/L (ANZECC, 2000) trigger value for the protection of slightly modified lowland river systems. During the summer survey (Figure 3.24) only 3 sites had a TN concentration above the trigger level, although sites with higher concentration were generally located in the headwaters of Blackfish Creek, Big Creek and Seabrook Creek where the lower 0.480 mg/L trigger level might be more appropriate.



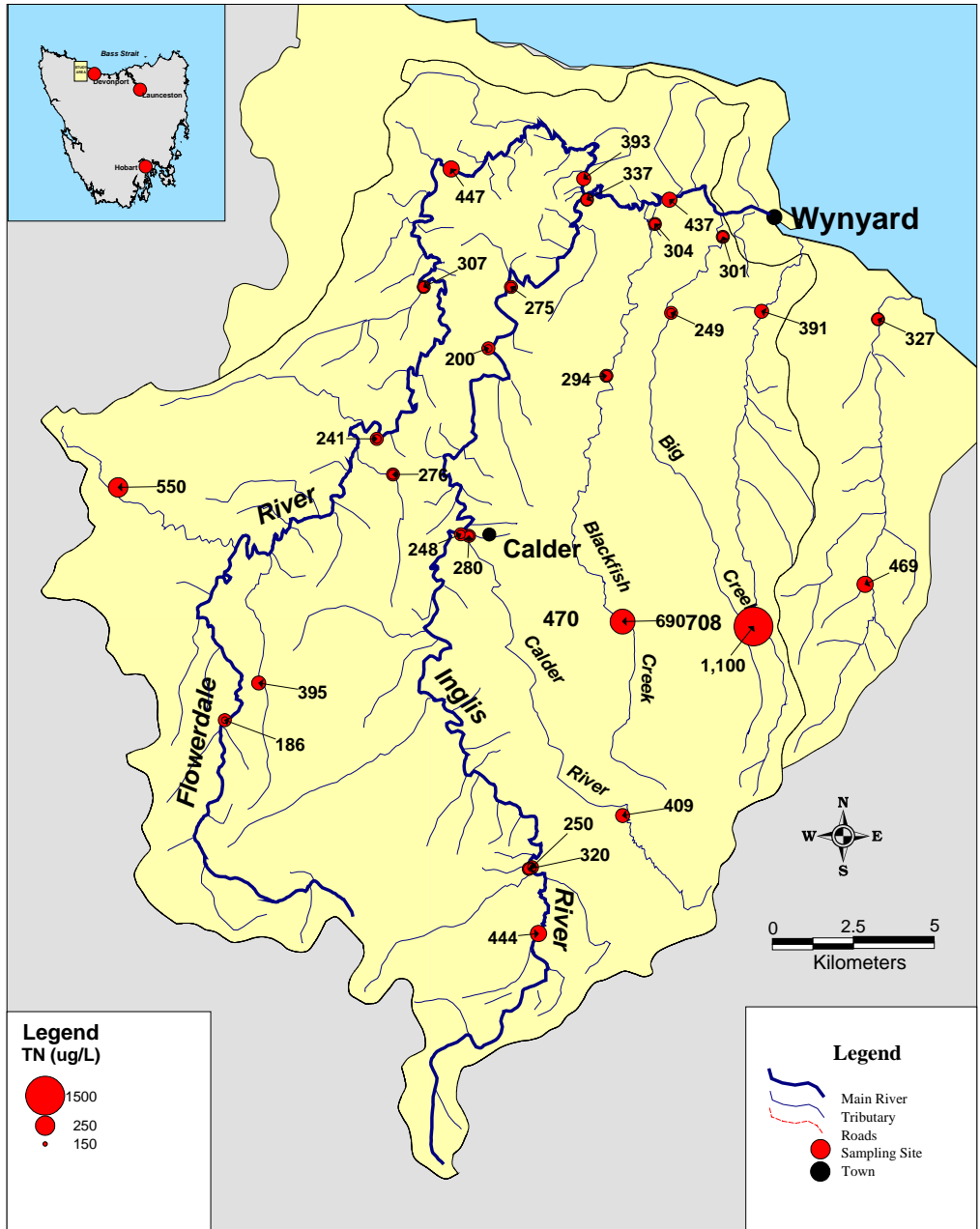
**Figure 3.21:** Snapshot of Nitrate-N concentrations recorded in the Inglis-Flowerdale catchment on 22 March 2000.



**Figure 3.22:** Snapshot of Nitrate-N concentrations recorded in the Inglis-Flowerdale catchment on 29 August 2000.

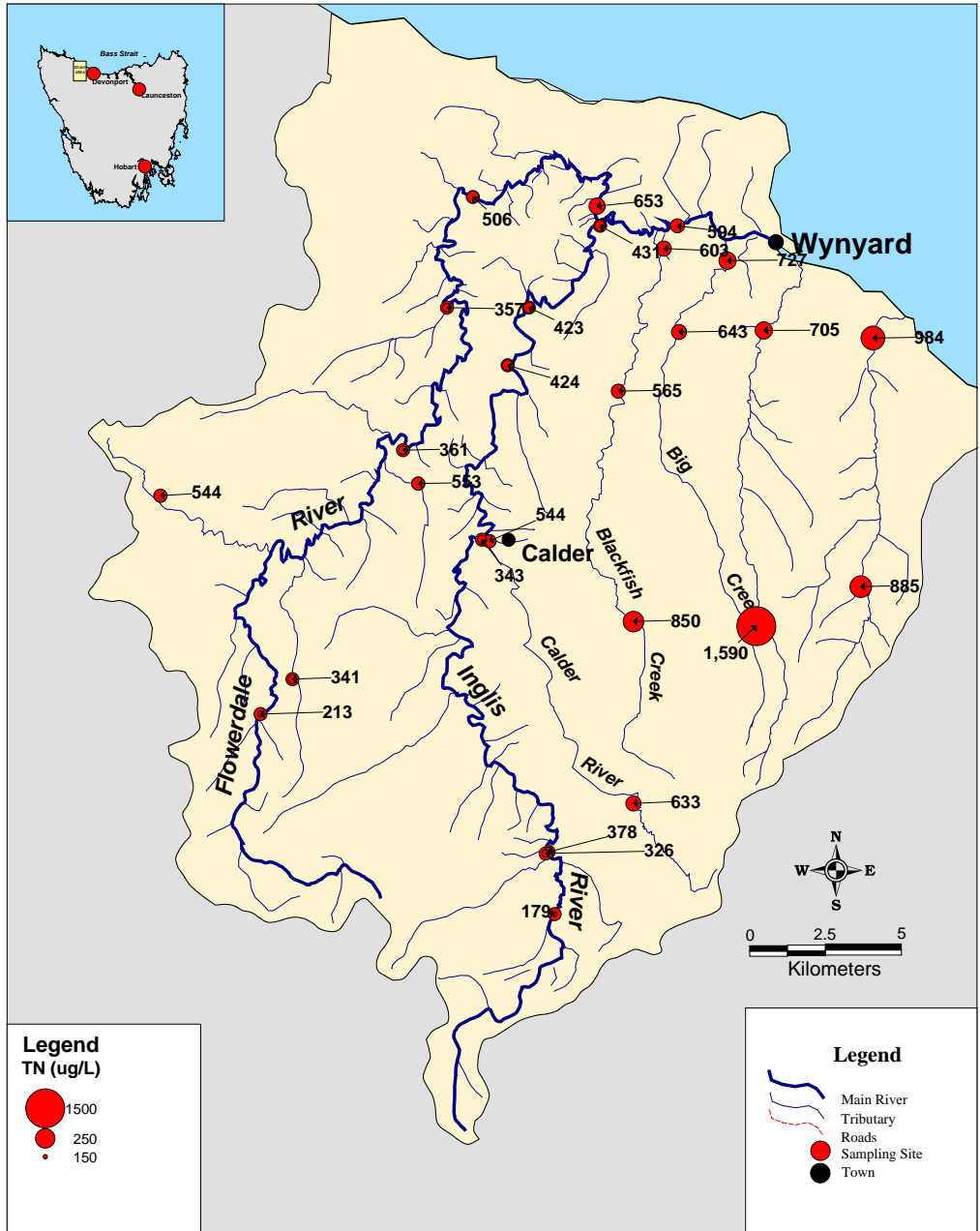


**Figure 3.23:** Snapshot of Ammonia-N concentrations recorded in the Inglis-Flowerdale catchment on 22 March 2000.



**Figure 3.24:** Snapshot of Total-N concentrations recorded in the Inglis-Flowerdale catchment on 22 March 2000.





**Figure 3.25:** Snapshot of Total-N concentrations recorded in the Inglis-Flowerdale catchment on 29 August 2000.