



## swanbank power station case study

### Investigation of Fish Kill at Swanbank Power Station

March 2006 – May 2006

When power station operators noted that fish, and particularly long-finned eels, were dying in large numbers in Lake Swanbank, frc environmental was commissioned to investigate. Through assessment of key ecosystem health indicators, the capture and investigation of morbid fish and the post-mortem examination of dead fish, frc environmental were able to confidently attribute the deaths to a bacterial infection associated with recent inflows from the broader catchment.

#### Project requirements overview

Once the deaths were noted, and the EPA notified, it was critical to determine the cause as swiftly as possible. With an impeccable environmental record and a genuine interest in effective environmental stewardship, CS Energy were concerned to determine the cause.

frc environmental were commissioned to investigate the deaths and determine the cause. We were also required to assess the risk of disease spreading to downstream environments.



*A holistic approach is often essential to gaining the depth of understanding necessary for confident action - frc environmental's team of experts understand the value of teamwork and the synergies that result*



*Lake Swanbank provides important habitat for a diverse community of native fishes, invertebrates and water birds*

### Project Performance

- Rapid response to a time-critical issue
- Comprehensive expertise to assess and prioritise issues
- Capacity to respond to emerging data and refocus studies to ensure cost-effectiveness
- Credibility to gain the timely co-operation of Fisheries Queensland and inter-state agencies
- Capacity to interpret research results to both confidently assess on-going risk, and support enhanced environmental management



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## Our tailored approach and methodology

With an experienced fish pathology group, **frc environmental** realised that time was of the essence and promptly arranged a site inspection, and for samples to be collected and returned to our laboratory. Preliminary post-mortems confirmed a likely pathology rather than environmental stress, however morbid or freshly dead fish were essential for a definitive conclusion.

Supported by CS Energy, **frc environmental** ecologists conducted an ecosystem health assessment of the lake; water and sediment quality, macro-invertebrate community structure and macrophyte health. The community structure of the lake's fish community was also determined through focused survey. We also reviewed the lake's catchment (as potentially a contributory factor) and downstream environs (as waters that may need to be protected).

Long-finned eels were confirmed as the most commonly affected species, exhibiting symptoms ranging from haemolysis and anaemia to septicaemia. Using fyke nets (particularly suited to capture eels), **frc environmental** ecologists captured morbid eels that yielded tissue samples that were ideal for pathological examination; a bacterium was readily identified.

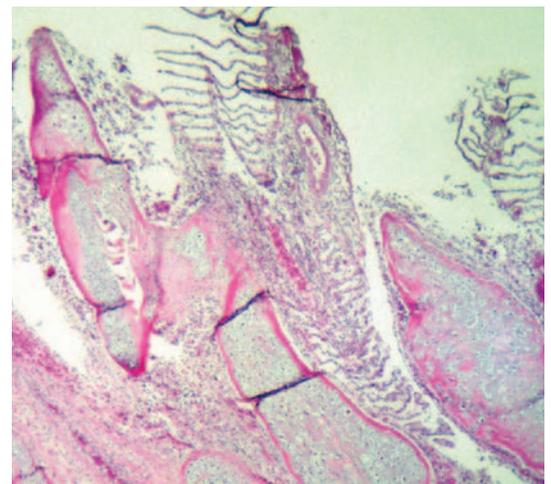
Liaising with both local and interstate government veterinary laboratories and fisheries agencies, it was determined that similar outbreaks had been recorded in southern states over the past year.

**frc environmental's** multi-faceted investigation concluded that recent inflow of nutrient-rich waters to Lake Swanbank elevated oxygen demand and may also have provided the 'substrate' upon which bacterial pathogens were introduced to the lake (with water birds acting as the vector). Seasonal sexual development is likely to have also contributed to many eels susceptibility to infection. Bacteria are likely to have initially infected the gills; weakened eels commonly developed bacterial septicaemia and toxemia. From our investigation it was clear that CS Energy's reliance on the lake for cooling water was unlikely to have contributed to the outbreak.

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*frc environmental's specialist ecologists know fish from the inside out*



*frc environmental offers the expertise to 'look deeper' into the cause of fish kills*

### industry experience

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