

## Epizootic haematopoietic necrosis (EHN)

Mass mortality of redfin perch (*Perca fluviatilis*); note the small size of individuals affected and the swollen abdomen of the fish at the centre of the photograph



Source: J Humphrey

Note the characteristic haemorrhagic gills of the redfin perch (*Perca fluviatilis*) on the left



Source: J Humphrey

### Signs of disease

**Important:** Animals with disease may show one or more of the signs below, but the pathogen may still be present in the absence of any signs.

### Disease signs at the farm, tank or pond level are:

- typically many (hundreds or thousands) small, dead fish less than 10 cm long found on the downwind bank of the water body
- large numbers of fish-eating birds (e.g. seagulls) at the water surface
- loss of appetite
- juveniles (<25 mm long) often swimming in a disorientated fashion at the surface
- occasional adults affected when the disease first arrives in an area.

### Gross pathological signs are:

- swollen abdomen
- darkened skin colour
- petechial (pinpoint) haemorrhages at the base of the fins
- haemorrhaging of the gills
- dead fish
- enlargement of the kidney, liver and spleen
- focal white to yellow liver lesions.

### Microscopic pathological signs are:

- coagulative or liquefactive necrosis of the liver, kidney and spleen
- necrotic lesions in the heart, pancreas, gastrointestinal tract and gills
- small numbers of basophilic intracytoplasmic inclusion bodies surrounding necrotic areas of the liver and kidney.

### Disease agent

EHN in Australia is caused by epizootic haematopoietic necrosis virus (EHNV), a systemic iridovirus (*Ranavirus*).

Closely related ranaviruses cause similar systemic necrotising iridovirus syndromes in sheatfish and catfish in Europe (European sheatfish virus and European catfish virus).

Note: In this guide, only EHN disease caused by EHNV is discussed.

### Host range

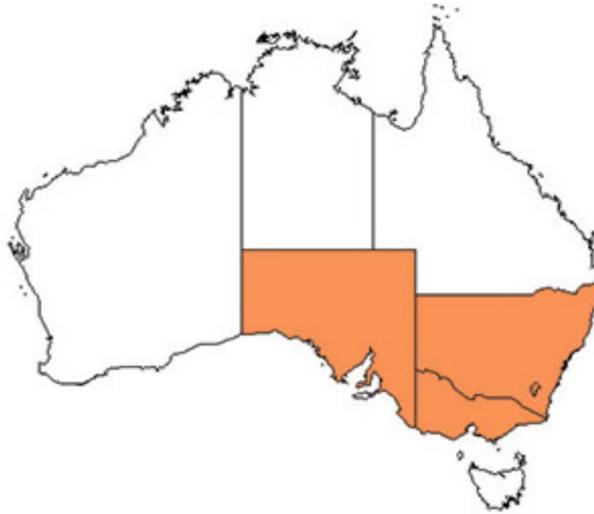
Species known to be susceptible to EHN are listed below.

Common name a	Scientific name
Macquarie perch	<i>Macquaria australasica</i>
Mosquito fish	<i>Gambusia affinis</i>
Mountain galaxias	<i>Galaxias olidus</i>
Murray cod b	<i>Maccullochella peelii peelii</i>
Rainbow trout a	<i>Oncorhynchus mykiss</i>
Redfin perch a or European perch	<i>Perca fluviatilis</i>
Silver perch	<i>Bidyanus bidyanus</i>

a Naturally susceptible (other species have been shown to be experimentally susceptible). b Demonstrated to carry EHNV.

## Presence in Australia

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EHN has been officially reported from the Australian Capital Territory, New South Wales, South Australia and Victoria.

### Epidemiology

- EHN is usually seen in Australia as large kills of small redfin perch. High mortality can also occur among older perch in newly affected areas.
- Clinical outbreaks are typically seen in fingerlings and juvenile fish, associated with poor water quality and/or certain water temperatures (between 11 °C and 17 °C in rainbow trout and above 12 °C in redfin perch).
- Mortalities occur over a short period (several weeks) in summer, and then the disease may disappear from an area for years.
- Low mortality rates over a period of months have been reported in young, farmed rainbow trout.
- Infectivity is less severe in rainbow trout than in redfin perch, with the disease mainly affecting fingerlings <125 mm long.
- Low-grade mortalities with covert EHN infection can also occur in juvenile fish. Therefore, care must be taken when moving redfin perch and rainbow trout from the known geographical range of EHN to areas where it is exotic, unless freedom can be adequately demonstrated.
- EHN is a resistant virus, surviving for months in water, persisting in frozen fish tissues for more than two years and in fish carcasses for at least one year.
- EHN may be carried on equipment including nets and boats, in fish (live or dead) used for bait and via the gut, feathers, feet and bill of piscivorous birds.

### Differential diagnosis

The list of similar diseases below refers only to the diseases covered by this field guide. Gross pathological signs may be representative of a number of diseases not

included in this guide, which therefore should not be used to provide a definitive diagnosis, but rather as a tool to help identify the listed diseases that most closely account for the gross signs.

### **Similar diseases**

Furunculosis, infectious haematopoietic necrosis, viral haemorrhagic septicaemia

### **Sample collection**

Due to the uncertainty in differentiating diseases using only gross pathological signs, and because some aquatic animal disease agents might pose a risk to humans, only trained personnel should collect samples. You should phone your state or territory hotline number and report your observations if you are not appropriately trained. If samples have to be collected, the agency taking your call will provide advice on the appropriate course of action. Local or district fisheries or veterinary authorities may also provide advice regarding sampling.

### **Emergency disease hotline**

The national disease hotline number is 1800 675 888. This number will put you in contact with the appropriate state or territory agency.

### **Further reading**

The accepted procedures for a conclusive diagnosis of EHN are summarised in the World Organisation for Animal Health Manual of diagnostic tests for aquatic animals 2011, available at [www.oie.int/en/international-standard-setting/aquatic-manual/access-online](http://www.oie.int/en/international-standard-setting/aquatic-manual/access-online).

Further information can be found on the disease pages of Fisheries and Oceans Canada at [www.pac.dfo-mpo.gc.ca/science/species-especes/shellfish-coquillages/diseases-maladies/index-eng.htm](http://www.pac.dfo-mpo.gc.ca/science/species-especes/shellfish-coquillages/diseases-maladies/index-eng.htm).

These hyperlinks were correct and functioning at the time of publication.