Algal bloom wildlife post-mortem report

Government of South Australia
Department for Environment and Water

Species – Short-tailed shearwater

Date collected – 22 December 2025

Location – Goolwa Beach

History relating to the animal

An adult male short-tailed shearwater (*Pufinus tenuirostris*) was found dead and collected from Goolwa Beach on 22 December 2025.

Clinical examination

The bird was already dead and so could not be examined prior to death.

Necropsy

The necropsy (looking at the whole body) revealed that the animal was in poor body condition and weighed 700 g. There was atrophy (wasting) of the pectoral muscles (chest muscles used for flight). There were mild post-mortem autolytic changes (decomposition after death). There was an abscess 2 x 2 cm in the tissue under the skin over the top right pectoral muscle. There was clear fluid in the lungs. In the kidney tissue there were multi-focal (in multiple places) small white foci (defined areas).

Tissues were collected for histopathology (looking at tissues under the microscope for more detailed information), and testing for avian influenza, Newcastle disease, and brevetoxins and other algal biotoxins (a possibility due to the algal bloom).

Histopathology

Samples from every major body system were examined under the microscope. The abscess over the pectoral muscle showed signs typical of an abscess in the skin and tissue under the skin, including inflammation, scarring, dead cells and bacteria. The adjacent muscle as well as the liver also had signs of inflammation. Examination of the lung revealed pulmonary oedema (fluid in the lungs). In the kidneys, there was a heavy burden of trematode (parasite) eggs.

Virology

Polymerase chain reaction (PCR) testing for avian influenza and Newcastle disease was negative.

Brevetoxins

No samples were above the limits of reporting.

Other algal biotoxins

No samples were above the limits of reporting.

Algal bloom wildlife post-mortem report

Government of South Australia
Department for Environment and Water

Summary

An adult male short-tailed shearwater was found dead. Laboratory examination revealed the bird had long-term weight loss, which contributed to illness, but the cause of death could not be determined. There were trematodes (parasites) in the kidneys which likely contributed to weight loss. Fluid build-up in the lung was likely a change that occurred at the time of death. There was a long-term abscess in the skin over the pectoral (chest) muscles, and mild inflammation in the underlying muscle and the liver; these were incidental (unlikely to be causing illness). It is possible that poor nutrition also contributed to the animal's weakened condition, possibly due to reduced food availability in the environment, although this could not be confirmed. Testing for avian influenza and Newcastle disease was negative. Brevetoxins and other algal biotoxins were also not detected.

[redacted] Shearwater – Goolwa Beach

Necropsy Report

CLINICAL HISTORY
This is a summary of the clinical history from the request form;
6-7 dead birds were found by the lifeguard dog along Goolwa beach.
The following birds were collected and submitted to the laboratory, 1 x shearwater, 1 x silver gull, 1 x crested grebe, 1 x crested tern

SAMPLES SUBMITTED
1 x adult male shearwater, Pufinus tenuirostris

NECROPSY FINDINGS
The bird is in poor body condition, the pectoral muscles bilaterally atrophied and the animal weighs 700 g. There are mild post-mortem changes. Over the cranial region of her right pectoral muscles there is an abscess approximately 2 x 2 cm within the subcutaneous tissue. Within the abscess there is gritty brown material.

On cut surface the lungs ooze translucent fluid (presumptive pulmonary oedema).

Multifocally the parenchyma of the kidneys is expanded by soft pale white foci generally less than 1 mm in diameter.

GROSS SUMMARY
Chronic weight loss
Possible Nephrocalcinosis / parasitic nephritis
Possible pulmonary oedema

SAMPLES COLLECTED & TESTING

Formalin fixed samples will be processed for histopathology.

Analytical services Tasmania will be contacted for a quote for testing of biotoxin and brevetoxin on liver, spleen, heart, lung, kidney, brain, gizzard contents.

Cloacal and tracheal swabs in VTM will be tested for avian influenza and Newcastle disease virus.

Duplicates of liver, spleen, heart, lung, kidney, brain are stored frozen.

COMMENTS
Chronic weight loss contributed to morbidity. Could the decrease in feed abundance related to the Karenia spp. bloom be a contributing factor for weight loss ?

Possible causes for the renal changes include nephrocalcinosis / trematodiasis / coccidiosis. Histopathology will clarify these changes.

Pulmonary oedema can be an agonal process or can be secondary to toxins such as those from Karenia sp. microalgae.

The cause of death is not found based on gross findings.

[redacted] Shearwater – Goolwa Beach

HISTOPATHOLOGY

REF: [redacted]
ADDITIONAL FINDINGS 17/1/2026
CLINICAL HISTORY
6-7 dead birds found by life guard along Goolwa beach.
@ least 1x shearwater

MACROSCOPY
Shearwater
One pot received labelled [redacted]
A = heart + lung + pectoral muscle
B = liver, proventriculus, pectoral muscle
C = kidney, trachea, jejunum, duodenum
D = gizzard, feathered skin with abscess
E = brain

MICROSCOPY

Liver: Focally and randomly hepatic cords are replaced and effaced by individual hepatocellular necrosis surrounded by low numbers of lymphocytes, plasma cells and heterophils. (Mild, multifocal, subacute to chronic, lymphocytic, plasmacytic, heterophils ink necrotising hepatitis)

Kidney: Multifocally the half the cortical medullary architecture is effaced and replaced by large numbers of operculated oval trematode ova 20-30 micron across. (Renal trematodiasis)

Feathered skin from over sternum and adjacent pectoral muscle: Focally extensively there is effacement and replacement of the dermis and subcutaneous tissue by necrosis, haemorrhage, oedema and extensive fibrosis admixed with moderate numbers of heterophils and macrophages fewer lymphocytes and plasma cells bordered by fibrosis. Within the inflammation there are admixed bacteria. (Moderate, focal, chronic, necrotising dermatitis and panniculitis with intralesional bacteria)

In the adjacent pectoral muscle, multifocally the interstitium between myocytes is expanded by low numbers of macrophages, lymphocytes, plasma cells and heterophils. (Mild, multifocal, subacute to chronic, lymphocytic, plasmacytic, histiocytic and heterophilic myositis)

Gizzard: Rare glands are distended by eosinophilic protein.

Lung: Diffusely there is pulmonary oedema expanding the lumens of air capillaries.

There is moderate autolysis of alimentary sections. Aside from this artifact there are no other significant findings.

This tissues not described are histologically unremarkable.

DIAGNOSIS
Pectoral muscle: Mild, multifocal, subacute to chronic, lymphocytic, plasmacytic, histiocytic and heterophilic myositis

Liver: Mild, multifocal, subacute to chronic, lymphocytic, plasmacytic,

heterophils ink necrotising hepatitis

Kidney: Renal trematodiasis (Renicola sp.)

Lung: Pulmonary oedema

Feathered skin over sternum and pectoral muscle: Moderate, focal, chronic, necrotising dermatitis and panniculitis and intralesional mixed bacteria and myositis

COMMENTS
The moderate trematode burden likely contributed to weight loss.

There is a focal chronic abscess with mixed bacteria and secondary myositis. This is an incidental finding.

The mild hepatitis is likely secondary to the abscess.

The pulmonary oedema may be an agonal process or Karenia sp. have been reported to cause acute pulmonary oedema in marine birds (Coulson et al 1968).

References
Coulson, J.C.; Potts, G.R.; Deans, I.R.; Fraser, S.M. Exceptional mortality of shags and other sea birds caused by paralytic shellfish poison. Br. Birds 1968, 61, 381-406

MICROSCOPY
Liver: Microorganisms are not seen on Gram, PAS (no fungal hyphae or Yeast are seen) , Wade fite or Ziehl Neelsen stains (no acid fast bacteria are seen).

COMMENTS
Please note that microbiological culture is more sensitive than the special stains.

[redacted] Shearwater – Goolwa Beach

NEWCASTLE DISEASE VIRUS RNA PCR (REAL TIME REVERSE TRANSCRIPTASE)

SPECIMEN ID	F Gene	M Gene	L Gene
POOL	Not detected	Not detected	Not detected

INFLUENZA A RNA PCR (REAL TIME REVERSE TRANSCRIPTASE)

SPECIMEN ID	Type A	H5	H7
POOL	Not detected		

SUMMARY DIAGNOSIS

Kidney: Renal trematodiasis (Renicola sp.)

Feathered skin over sternum and pectoral muscle: Cutaneous abscess and secondary mild myositis

Lung: Pulmonary oedema.

COMMENTS
The moderate trematode burden likely contributed to weight loss.

There is an incidental chronic abscess.

The pulmonary oedema may be an agonal process or Karenia sp. have been reported to cause acute pulmonary oedema in marine birds (Coulson et al 1968).

References
Coulson, J.C.; Potts, G.R.; Deans, I.R.; Fraser, S.M. Exceptional mortality of shags and other sea birds caused by paralytic shellfish poison. Br. Birds 1968, 61, 381-406

Biotoxin and brevetoxin testing is pending.

Tasmanian Government

ANALYTICAL SERVICES TASMANIA

18 St Johns Avenue New Town 7008 TAS
03 6165 3300
enquiries@ast.tas.gov.au
www.analyticalservices.tas.gov.au

Submission Number: [redacted]
Report Number:
Issue Date: 26/05/2026
Status: Final

CERTIFICATE OF ANALYSIS

Customer: [redacted]
Address:
Contact:

Submission Description: [redacted] Avian
Sample Received Date: 30/04/2026
Contract Number:
Client Order Number: [redacted]
Program/Quote Reference: Biotoxin and Brevotoxins

Sample(s) analysed as received. Sampling date and time data supplied by the client. The document shall not be reproduced except in full.
Additional information relating to this submission can be found in the sample receipt notification.
This report supersedes any previous reports with this submission number.
Many tests specify a holding time which gives the recommended timeframe by which a sample should be preserved/extracted and/or analysed after the sample is taken.
Holding time information can be found on the AST website https://analyticalservices.tas.gov.au/our-services/containers-samples-and-submissions .
Whilst every effort is made to analyse samples within these timeframes, situations can occur where this is not possible.
Where a test has been conducted outside the recommended sample holding time this should be taken into account when interpreting results.

The results in this report were authorised by:

Name	*Position*
[redacted]	**Section Head - Organic Chemistry**

Test Information:

Method ID	*Test Description*	*Date Commenced:*
3411	Lipophilic Toxins in Shellfish by LC-MS/MS	25-05-2026
3411A	Brevetoxins in Shellfish by LC-MS/MS	15-05-2026
3416	PST in Biota by LC-MS/MS (Boundy Method)	25-05-2026

Chemistry Test Results (Biota - Food)

		Sample Description	Heart	Lung	Kidney	Brain	Liver	Spleen	Gizzard Contents
		Sampled Date/ Time	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00
Method ID	Analyte	Units	465565	465566	465567	465568	465569	465570	465571
	AZA1	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	AZA2	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	AZA3	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	Domoic Acid	mg/kg WMB	<0.05*	<0.05*	<0.05*	<0.05*	<0.05*	*IS*	*IS*
	DTX1 Free	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	DTX1 Total	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	DTX2 Free	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	DTX2 Total	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
3411	GYM	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	Homo-YTX	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	*IS*
	OA Free	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	OA Total	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	PnTx-G	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	PTX2	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	SPX1	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	Total DST	OA eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	YTX	mg/kg WMB	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	*IS*
	Brevetoxin 1	mg/kg WMB	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*	*IS*	<0.10*
3411A	Brevetoxin 2	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	Brevetoxin 3	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	C1	STX.2HCl eq. mg/kg	<0.01*	*IS*	<0.01*	*IS*	<0.01*	*IS*	*IS*
	C2	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	C3	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
3416	C4	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	dcGTX1	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	dcGTX2	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	dcGTX3	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*

IS- Insufficient Sample

* NATA accreditation does not cover this result

Chemistry Test Results (Biota - Food)

		Sample Description	Heart	Lung	Kidney	Brain	Liver	Spleen	Gizzard Contents
		Sampled Date/ Time	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00	23/12/25 0:00
Method ID	Analyte	Units	465565	465566	465567	465568	465569	465570	465571
	dcGTX4	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	dcNEO	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	dcSTX	STX.2HCl eq. mg/kg	<0.01*	*IS*	<0.01*	*IS*	<0.01*	*IS*	*IS*
	doSTX	STX.2HCl eq. mg/kg	<0.01*	*IS*	<0.01*	*IS*	<0.01*	*IS*	*IS*
	GTX1	STX.2HCl eq. mg/kg	<0.01*	*IS*	<0.01*	*IS*	<0.01*	*IS*	*IS*
	GTX2	STX.2HCl eq. mg/kg	<0.01*	*IS*	<0.01*	*IS*	<0.01*	*IS*	*IS*
3416	GTX3	STX.2HCl eq. mg/kg	<0.01*	*IS*	<0.01*	*IS*	<0.01*	*IS*	*IS*
	GTX4	STX.2HCl eq. mg/kg	<0.01*	*IS*	<0.01*	*IS*	<0.01*	*IS*	*IS*
	GTX5	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	GTX6	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	NEO	STX.2HCl eq. mg/kg	<0.02*	*IS*	<0.02*	*IS*	<0.02*	*IS*	*IS*
	STX	STX.2HCl eq. mg/kg	<0.01*	*IS*	<0.01*	*IS*	<0.01*	*IS*	*IS*
	Total PST	STX.2HCl eq. mg/kg	<0.10*	*IS*	<0.10*	*IS*	<0.10*	*IS*	*IS*

IS- Insufficient Sample

* NATA accreditation does not cover this result