

Version 1.2

INTRODUCTION	RATIONALE	PREPAREDNESS	BIOLOGICAL ADVICE	IMPACT ASSESSMENT	LIBRARY	WEB LINKS	TECHNICAL DOCUMENTS	SHOPPING LISTS
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# HANDBOOK ON OIL IMPACT ASSESSMENT

## 4.0 SPILL RESPONSE

### 4.1 Assessing the damage

#### Technical document

#### Standard autopsy: post-mortem examination of stranded seabirds

An autopsy will normally follow a session in which the carcass is examined from the outside and where the biometrical data are collected. A standard autopsy in case of an oil spill is primarily meant to assess age and sex of casualties where external characteristics are unclear. At the same time, however, the physical condition of the casualties can be evaluated. In spills where a large quantity of oil is involved and birds die very quickly, many casualties may be in excellent condition (fat stores, muscle profile, organ condition), whereas in spill where casualties are lightly oiled, the physical condition of the birds when they eventually died is often very poor (fat stores depleted, atrophy, organs affected). Finally, when a standard autopsy is performed, it is easy to collect and store (deep freezer) stomachs and guts for subsequent diet studies. This is not part of an impact assessment, but the results are very valuable in the absence of other, more direct means to study the ecology of seabirds at sea away from the breeding grounds. In order of priority and relevance:

topic	relevance impact assessment	ecological study
age characteristics	high	high
sex	high	high
physical condition	high	moderate
condition of vital organs	moderate	low
diet	none	high

#### Ageing

For all birds in which plumage characteristics are either non-existent, unclear, or covered by oil, a rapid check of the gonadal development and the presence/absence (size) of the bursa Fabricii is required. A combination of the two factors will separate adult birds from juveniles, while immatures (non-breeding birds) can be separated with some degree of certainty. For the impact assessment it is vital to obtain an estimate of the proportion of adult birds affected (potential breeding birds in the forthcoming season).

#### Sexing

In many areas, away from the breeding grounds, the sexratio is significantly different from even. A strong bias towards one sex will have disproportionate effects on the population level and this information (obtained during ageing) is therefore highly relevant.

Precisely how to age and sex birds, or how to evaluate the physical condition of the birds is described in separate manuals (hyperlinks provided), while the illustrations below show how a standard autopsy can be performed. The standard autopsy is not an exhaustive pathological study of individual causes of death.



(1) Place the corpse on its back, feet towards you, head folded to one side.



(2) Gently fold feathers away to expose the centre of the breast and belly. The keel of the sternum can be felt and sometimes even seen as in the picture; this is where the feathers should be folded away to either side.



(3) Gently cut the skin following the keel of the sternum down, without cutting into the muscle.



(4) All the way down, stop just above the cloaca. In Common Guillemots, as the example, the sternum is very long, in other species the keel of the sternum will run till half way down; work down in a straight line, without damaging the intestines.



(5) Loosen the skin with the fat (if present) from the flesh, without tearing away any tissue. Expose the inside of the skin and fold away to score subcutaneous fat deposits and evaluate the condition of the breast muscle. {Condition manual}



(6) Lift the sternum and cut the stretched membrane as shown with a small puncture. Make sure neither the intestines, nor the liver are punctured.



(7) Just a small hole will do, put away the knife.



(8) Two thumbs can be used to spread the hole without damaging any of the underlying organs. Open a wide gap by stretching the membrane to either side.



(9) Use some force to open the body cavity by holding the carcass down while lifting the sternum. On either side, the ribs and the membrane between the ribs will stretch. Some (bone-)breaking sound is normal, but don't overdo this.



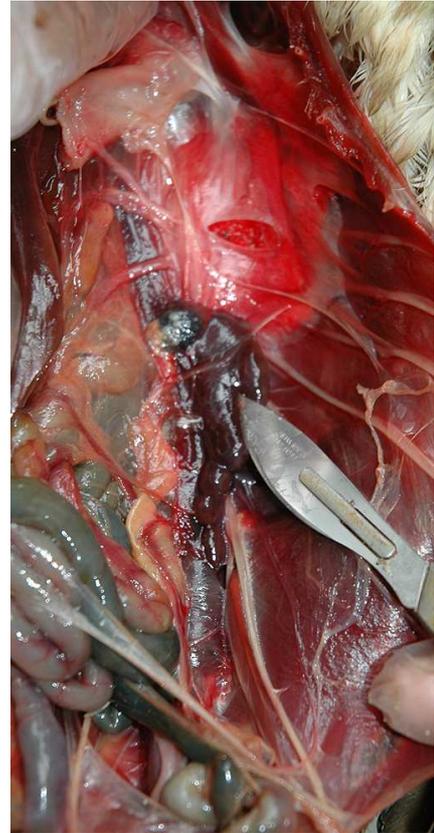
(10) Cut the ribs on the right side, parallel to the sternum.



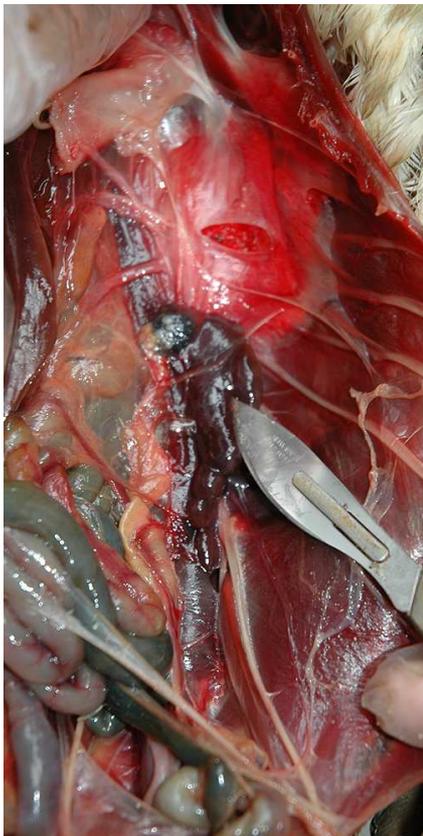
(11) Similarly, cut the ribs on the left side to allow the body cavity to be opened entirely.



(13) Check the lungs, cutting the membrane if unclear. Check the {Condition manual} for further details



(14) Sex the bird {Ageing manual}.



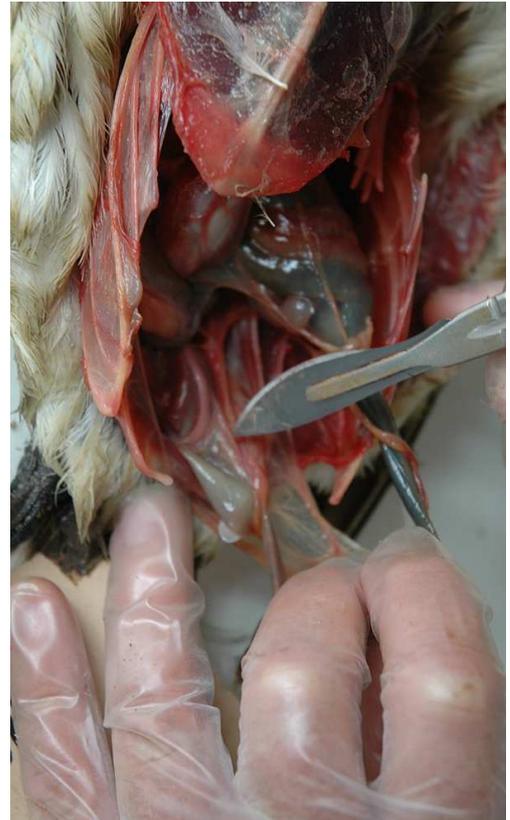
(15) ) Check the kidney {Condition manual}



(16) Check the liver for colour and shape; an early step in corpse decomposition is the liver turning green or greenish. {Condition manual}



(17) Check the intestines; healthy guts should be stiff and pink with clearly visible veins. Do not forget to score deposited fat {Condition manual}



(18) Check the presence (and if so the size) of a bursa Fabricii by folding the gut towards you. {Ageing manual} The bursa should be positioned between the two ureters. (Absent in this example)



(19) In case of a diet study, pull out the stomach (make sure not to press, for food remains may be pressed upwards and 'escape' in that case), and try to clip the proventriculus as high as possible.



(20) Stomach cut loose and ready for storage (deep freeze) or immediate processing. {Diet manual}

**Instruments needed**

Instruments needed for a standard autopsy are a set of scalpels with plenty spare knives (non-sterile), pairs of scissors, callipers, disposable vinyl or latex protective gloves, protective clothing and perhaps mouth caps (to avoid inhaling hydrocarbons or pathogens), A4 clip-boards, datasheets, pens, plastic bags for stomach collections, glass or plastic containers to store any other samples. There should be easy access to a tap with clean fresh water, and nearby deep-freezing facilities are strongly recommended. A shopping list is provided {[autopsy shopping list](#)}

**References, further reading**

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The pattern of diseases found upon the necropsy of marine birds will be different depending on the origin of the bird (the wild or rehabilitation centre). The ratio of oiled/non-oiled birds and therefore the necropsy results will vary with the time of year and the species involved (coastal, estuarine or pelagic species). At necropsy one should be familiar with the anatomical peculiarities of the different marine species. The main reasons for a necropsy are to get valid information about the mortality cause and biological information about the species, to confirm a diagnosis, to checking an unsuccessful therapy, to enlarge knowledge, or simply to find out what is going on. The main problems/diseases/necropsies seen in marine birds at beach surveys are: acute and chronic oil pollution, chemical pollution, food shortage, entanglement, plastic ingestion, and infectious diseases (esp. parasites). In rehabilitation centres the main medical problems are related to management, dehydration, cloacal impaction, gizzard impaction, ulcers and bumblefoot, corpora aliena, stress, viral infections (e.g. duck plague), bacterial infection (e.g. avian cholera, tuberculosis), fungal infections (e.g. aspergillosis), and parasitic infestation (worms and protozoans). The necropsies and the diagnoses will be discussed

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During the 1992-1993 winter, 133 seabirds found on Belgian beaches were necropsied. Most frequent species were the guillemot (*Uria aalge*), the oystercatcher (*Haematopus ostralegus*), the kittiwake (*Rissa tridactyla*), the razorbill (*Alca torda*) and the herring gull (*Larus argentatus*). The three main observations were, in decreasing order, cachexia, acute and hemorrhagic gastro-enteritis, and oil contamination of plumage and intestinal tract. The pelagic origin of seabirds was associated with all 3 observations oil contamination was associated with acute gastro-enteritis and cachexia and, finally, the immature character was associated with cachexia. A hypothetical mechanism of death would be oiled pelagic seabirds that become cachectic and die of acute gastro-enteritis. It is unlikely that seabirds act as a reservoir for bacteria, that were only occasionally identified in our material. Therefore, it appears that infectious agents play a minor role in seabirds stranding.

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