

Oil from rendered seal blubber and Determination of external Petroleum Oil exposure: An observation in oiled ice-associated seals

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Background

NRDA injury assessment is a critical and integral part of an oil spill marine mammal response in the Arctic. Prior to evaluation of injury and/or adverse effects from petroleum-based oil exposure on a resource, **demonstration of exposure (i.e. visual; chemical; molecular biomarkers)** is needed.



| EXT. OIL ID | Signs of Oiling | Oil Visible | Skin Burns | Smell | Area Oiled | Head | Body | Multiple | Entire |
|-------------|-----------------|-------------|------------|--------|------------|-----------------|---------|----------|---------|
| | Oil Color | Black | Brown | Clear | Other | Depth of Oiling | Deep | Moderate | Surface |
| | % Oiled | <2% | 2-25% | 26-50% | 51-75% | 76-100% | Samples | Hair | Swab |

TABLE 1. Lipid Content (g/100 g tissue) of Selected Tissues from Four Species of Seals.¹

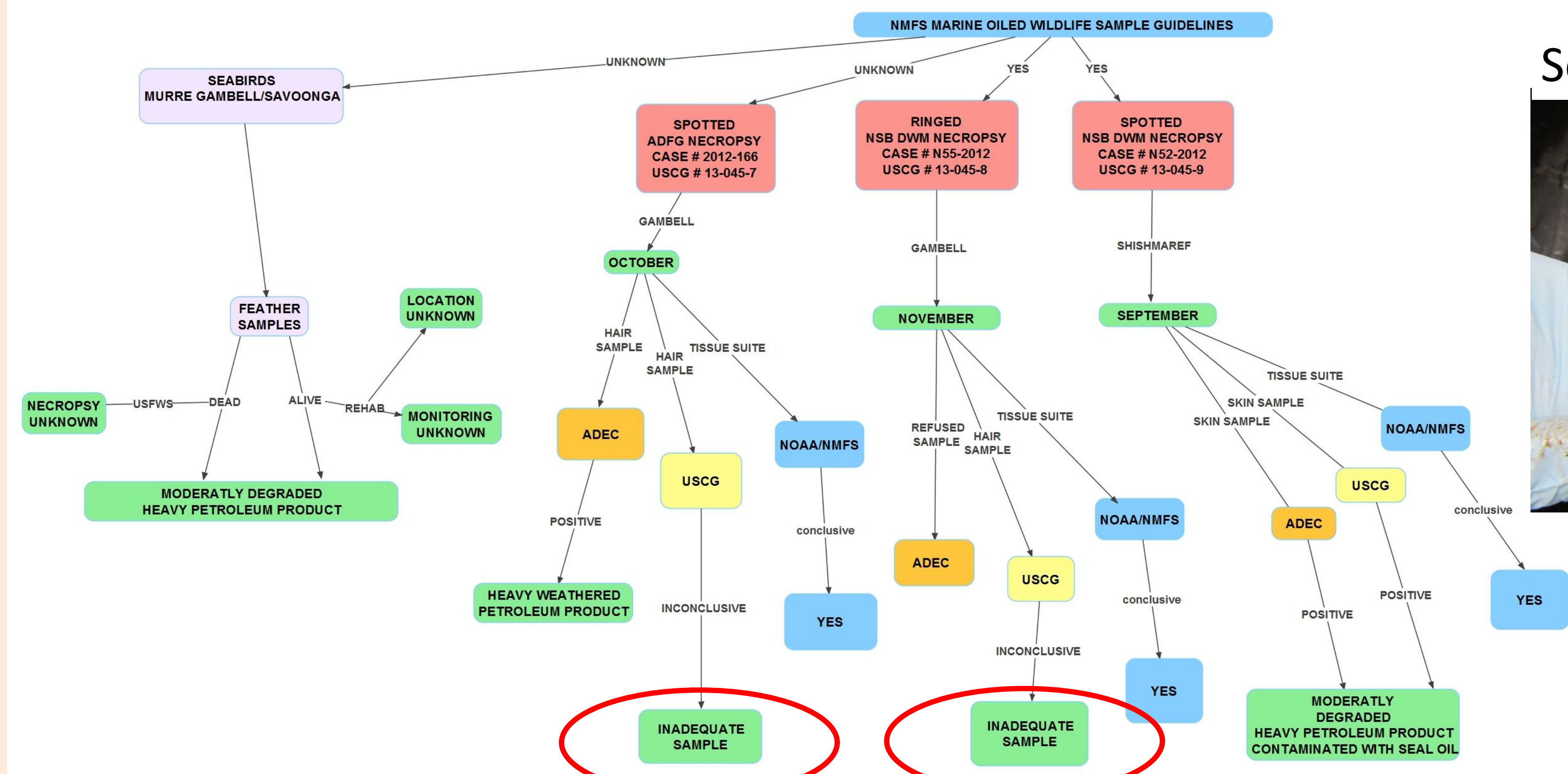
| Tissue | Harp | Gray | Ringed | Hooded |
|---------|--------------|--------------|--------------|--------------|
| Blubber | 93.88 ± 1.64 | 91.93 ± 1.07 | 93.55 ± 1.98 | 89.43 ± 1.82 |
| Muscle | 1.92 ± 0.03 | 1.82 ± 0.03 | 1.85 ± 0.53 | 2.36 ± 0.74 |
| Brain | 8.10 ± 0.32 | 10.25 ± 0.10 | 6.86 ± 1.01 | 7.40 ± 0.79 |
| Kidney | 2.97 ± 0.18 | 3.42 ± 0.04 | 3.58 ± 0.07 | 3.14 ± 0.05 |
| Heart | 2.19 ± 0.31 | 1.81 ± 0.38 | 2.32 ± 0.01 | 2.04 ± 0.01 |
| Liver | 3.83 ± 0.19 | 5.60 ± 0.94 | 3.71 ± 0.07 | 3.66 ± 0.03 |
| Lung | 2.24 ± 0.46 | 2.04 ± 0.03 | 2.05 ± 0.07 | 1.76 ± 0.01 |

¹Data from Ref. (6).



Rendering seal oil from blubber

Seal Oil- PAH Chemical Analysis Interaction?



Seal oil Solvent Action



Tips TO reduce Seal oil contamination of tissue samples

- 1) initial gauze swipes to fouled area - on site;
- 2) carcass: packing skin sample sites, wounds and other areas where seal oil leakage could occur with absorbent material,
- 3) remove frozen skin / blubber samples from tinfoil prior to thawing, or to trim blubber from skin samples prior to collection in aluminum foil.

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