**ZC-11 Individual Animal Report Excerpted from:**
**2005 Ketten, D. R., Beaked Whale Necropsy Findings for Strandings in the Bahamas, Puerto Rico, and Madeira, 1999-2002. WHOI Technical Report WHOI-2005-09. pp. 1-38 at**

**http://www.whoi.edu/csi/images/WHOI-2005-09.pdf**

**Specimen ID/sex: 11-Zc male 17 feet total length**
Species: *Ziphius cavirostris*
Date of stranding: reported 16/03/00; presumed stranded 15/03/00
Location: Golden Rock Creek G.B 26.30N/78.22W
Preliminary condition: Code 3/Dead-decaying
Analyses to date: field dissection
Tissue Dispositions: Bater/Ewing unless otherwise noted
Skull-frozen
Left ear – formalin
Right ear *in situ*-frozen
Eye, testes-formalin
Skin-frozen and DMSO
Serum, hemolyzed blood-frozen
Tooth - dried (K. Balcomb)
Observations/other observers:
This animal was found, buried, exhumed, and examined in tandem with the female described above. All observations noted below were photo-documented.

**Observations/Ketten/Cranial/Temporal regions:**
As described for the previous animal, the head was extracted from the ice bath and placed ventral up for examination. Most of the superficial tissue had been removed during the beach necropsy, including the majority of the dorsal, ventral, and lateral musculature. The head had been cleanly decapitated at the occiput. All tissues are badly necrosed. There is no gross evidence of fracture on any cranial surface. Sutures are intact and fused. Occipital notch to tip of mandible length is 87 cm; the length between mandibular rami, 28.5 cm. The brain is fully autolyzed; no samples of central nervous system tissues were taken.
Substantially more flesh was removed from the right vs. left side prior to this exam. There are extensive, diffuse patches of blood throughout the head. The narial passages have multiple, mottled areas in the superficial mucosa. There are no discrete external hemorrhagic areas in either mandible, however, discrete hemorrhagic regions are present in the left, medial, intra-mandibular fat body and in adjacent tissues adhering to the ventral surface of the pre-maxillaries.
The temporal bones (tympano-periotic complex) are normally positioned, and there is no indication of overt fracture in the bony elements of the tympanic or periotic bullae. The bone of the periotic bulla is slightly rugose, suggesting either a fully adult male or a prior

moderate inflammatory episode. The majority of the residual peribullar tissues are poorly preserved and the residual tissues are unremarkable, considering their state of preservation, with the following exceptions. The left peribullar cap has petechial hemorrhagic areas. Blood is found on the medial periotic surface filling the left internal auditory meatus and the facial nerve foramen. There is a similar deposition of blood in the left round window niche. The cochlear aqueduct - remarkably - is relatively free of blood, and in comparison to the female ear described above, the corpus cavernosum is significantly less infiltrated. The right peribullar areas are unremarkable and the right ear was left *in situ*.
The left ear was extracted, perfused with buffered formalin via the internal auditory canal and round window and placed in buffered formalin in a sealed whirl pak.

**Findings:**
As in the female reported above, the state of the head (necrotic and flensed) makes any conclusion about trauma or disease equivocal. The dimensions and appearance of the skull and temporal bones are consistent with an adult male of this species. There is no overt evidence of fracture and deep bone bruising consistent with near blast trauma. However, there is concern of a pressure induced trauma based on the well-defined hemorrhagic region present in the left, medial, intra-mandibular fat bodies and in adjacent premaxillary tissues. Depositions of this type are consistent with pressure dependent trauma, including shock wave and because the fats are thought to be pinnal and tympanic analogues, they may respond similarly (e.g. hemotympanum) to moderate or low blast pressure zones or to exceptionally intense acoustic pressures. Were these hemorrhagic areas simple lividity, similar depositions would be expected in adjacent lateral tissues as well. The absence of attendant lateral hemorrhagic areas therefore raises the concern but does not assure that the areas noted are the result of a specific insult. The smaller hemorrhagic areas in the narial passages are consistent with this concern.
Pooling of blood in periotic apertures and mottling of the peribullar cap are suspicious but consistent with post-mortem artifact. Given the differences in observations on the male and female heads examined the CT examinations are likely to be worthwhile to determine whether there are significant patterns of intracochlear blood, although findings are still likely to be equivocal. As with the female noted above, the utility of histological analyses of the ears from this animal are of questionable value at this point.

**Summary:**
Poor preservation/Extensive autolysis/Superficial narial mottling/Diffuse cranial bruising/Discrete bruising Lt mandibular fats/Temporal bone bilateral inflammatory changes/Peribullar petechiae Lt/IAM and FR niche clots