

# Appendix 9. Animal and fish bones

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## A9.1 Bone catalogue

Eleven samples of bone resulting from the wet-sieving programme were analysed. The sites sampled include four abandoned bedouin encampments that were recorded in detail as part of the ethnographic study (WF869, WF909, WF940 and WF982), as well as small samples from Roman/Byzantine settlements (WF282 and WF1415). The WF1415 is particularly significant as it comes from a midden identified on the west side of the large site that commands the approach to the most intensive Roman mining complex. A list of the material identified is as follows:

### WF869 (833)

1 rib midshaft fragment (burnt/calced white) – sheep/goat/gazelle-sized.

### WF909 (Floor SS30, 920)

7 small fragments of burnt mammal bone?

### WF909 (Floor SS31, 950)

1 bone fragment (burnt) – unidentified.

### WF940 (809)

4 bone fragments (burnt grey) – mammal?

### WF940 (819)

1 rib shaft fragment (burnt grey) – sheep/goat/gazelle-sized.  
1 limb bone fragment (burnt grey) – mammal?

### WF982 (883)

1 limb bone fragment – small mammal?

### WF1282 (797)

1 rib fragment – small mammal.

### WF1415 (783)

1 limb bone fragment – small mammal?  
5 unidentified mammal (?) bone fragments.

### WF1415 (785)

2 very small fish vertebrae – Clupeidae? (centrum =1 mm diameter).  
16 unidentified fish bone fragments.

### WF1415 (Midden ES2, 785)

2 unidentified fragments – mammal?.  
2 fish molariform teeth – These look like they are from emperors (?) (Lethrinidae: *Lethrinus* spp.) as both have a small dimple on top of the middle of the cusp, rather than the more smooth rounded seabream (Sparidae) teeth.  
1 palatine fragment – unidentified fish.  
1 cleithrum fragment – unidentified fish.

8 fish spine fragments.

12 unidentified fish bone fragments.

### WF1415 (787)

1 sheep/goat/gazelle upper molar fragment.  
1 sheep/goat/gazelle-sized rib shaft fragment.  
2 caudal vertebra – small mammal.  
1 ulna fragment – unidentified bird.

## A9.2 Summary

The bones examined were very fragmentary, and a good proportion of them had been exposed to burning. The residue bone includes fragments of mammal, small mammal, bird and fish. Larger mammals were represented by sheep/goat or gazelle. The bone fragments were too fragmentary to determine precisely which was present. It was not possible to identify the single bird bone fragment. Small mammals were noted; these were probably from some sort of small rodent. Fish bone fragments occurred in only one sample: WF1415 – 785 – Midden ES2. This sample included two loose teeth from what appeared to be emperors (Lethrinidae: *Lethrinus* spp.). In the same sample, two tiny fish (?Clupeidae) vertebrae were noted, these were only about 1 mm in diameter.

Emperors (Lethrinidae) are distributed in the tropical waters of the Indo-Pacific. Lethrinids are bottom-feeding, carnivorous, coastal fishes, ranging primarily on or near reefs. They typically feed primarily at night on benthic invertebrates or fishes, those with molariform teeth mainly on hard-shelled invertebrates (Carpenter and Allen 1989). As they do not occur in the Mediterranean, this suggests that the fish at Wadi Faynan may have been imported from the south. Such a phenomena is well attested in later periods, e.g. during the Roman and Byzantine era in Jordan (Beech and Prance in press; H. Lernau 1986; O. Lernau 1995; H. Lernau and O. Lernau 1989; 1992), when considerable quantities of fish were evidently imported from the Red Sea.

The presence of the tiny fish (?Clupeidae) vertebrae, which were only about 1 mm in diameter is intriguing. Whilst no large quantities of these have been observed within the samples, it is possible that they may have originated from some sort of fish sauce or similar stored fish product (cf. Cotton *et al.* 1996; Studer 1994).

