Supplementary Material

**Osteofluorosis in Free Ranging California Sea Lions (*Zalophus californianus*)**

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# Supplemental Tables

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|  | Week 1 | Week 3 | Reference Range | High (H), Low (L), Normal (N) |
| White blood cell count (x103/mm3) | 8.6 | 4.4 | 9.4 – 22.8 | L |
| Blood urea nitrogen | 69 | 114 | 17 – 41 | H |
| Creatinine | 1.46 | 2.00 | 0.0 – 1.0 | H |
| Sodium | 159.8 | 184.1 | 144 – 154 | H |
| Chloride | 118.6 | 145.5 | 91 - 123 | H |
| Potassium | 3.92 | 4.08 | 4.1-5.1 | L |
| Phosphorous | 6.9 | 8.1 | 4.3 – 6.7 | H |
| Total calcium | 9.7 | 9.6 | 8.3 – 9.7 | N |
| Albumin | 2.9 | 2.8 | 2.4 – 3.4 | N |
| Parathyroid hormone (pmol/L) |  | 3.4 | NA | H\* |
| Ionized calcium (mmol/L) |  | 1.31 | NA | N\* |
| 25-Hydroxyvitamin D (nmol/L) |  | 129 | NA | N\* |
| Vitamin E (µg/mL) |  | 32.71 | 2.0 – 10.0# | H |
| Vitamin A (ng/mL) |  | 553 | 200 – 500# | H |
| Cobalt (ng/mL) |  | 0.28 | > 0.25+ | N |
| Copper (µg/mL) |  | 1.16 | 0.6 – 0.9+ | H |
| Iron (µg/mL) |  | 44 | 110 – 180+ | L |
| Manganese (ng/mL) |  | 4.7 | 1.5 – 2.5+ | H |
| Molybdenum (ng/mL) |  | 12.7 | 12 – 30+ | N |
| Zinc (µg/mL) |  | 0.67 | 0.9 – 2.0+ | L |
| Selenium (ng/mL) |  | 307 | 70 – 100+ | H |

**Supplemental Table 1.** Case 1 serum biochemistry at admittance (week 1) and euthanasia (week 3). Unless otherwise indicated, reference ranges are as previously reported for CSL (Gulland et al., 2018). Asterisks indicate comparison of measured serum concentrations in case versus previous CSL cases submitted to Michigan State University Veterinary Diagnostic Laboratory (MSU VDL). Hashtags indicate comparisons to, and reference ranges of, domestic animals as established by MSU VDL. Crosses indicate comparisons to, and reference ranges of, domestic cattle as established by MSU VDL. NA denotes not available.

# Supplemental Figure Legends

**Supplemental Figure 1.** Radiographic versus gross appearance of humeri in osteofluorosis and control cases. (A) Radiograph of case 1 humerus with hyperostosis (arrow). (B) Postmortem radiograph of control 1 humerus. (C) Case 1 humerus with hyperostosis on diaphysis and deltoid tuberosity. (D) Control 1 humerus.

**Supplemental Figure 2.** Select gross and histologic lesions from osteofluorosis cases and controls. (A) Control 1 mandible and teeth. (B) Case 2 mandible with hyperostosis and marked dental wear. (C) Case 2 os penis with moderate proximal hyperostosis. (D) Histology (H&E) of thinner inner trabeculae comprised of poorly mineralized osteoid (asterisk), reversal lines (arrow), lined by osteoblasts and osteoclasts (arrowhead). Intertrabecular spaces comprised of fine connective tissue and capillaries.