

CANADA'S ACCREDITED ZOOS AND AQUARIUMS



ELEPHANT WELFARE ASSESSMENT

**INDEPENDENT REVIEW OF EDMONTON VALLEY ZOO'S
ELEPHANT PROGRAMME ACCREDITATION VARIANCE**

REVIEW BY
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Aim

- 1.01 This document aims to assess the welfare situation for Skanik (Lucy), the lone Asian elephant at Edmonton Valley Zoo, as part of the CAZA Accreditation Process, specifically to review the variance granted under the CAZA Standards. Consideration as to the appropriateness of the currently granted variance with regards to the lone Asian elephant includes (i) a veterinary and welfare assessment of Skanik; (ii) review of the findings in lieu of the historical context; and (iii) recommendations in relation to the continuance of the exemption from the CAZA Standards.

Executive summary

- 2.01 A veterinary and welfare assessment of Skanik (Lucy), the 41-year-old Asian elephant female was carried out by Dr. Jonathan Cracknell BVMS CertVA CertZooMed MRCVS from the 17th June until the 22nd June 2016.
- 2.02 The assessment included shadowing of the keeping team and reviewing Skanik through daily routines, a comprehensive veterinary examination working alongside consulting and collection veterinarians; and a complete review of her history and associated documentation.
- 2.03 Dr. Cracknell was impressed at the professionalism and wide ranging opportunities provided by the elephant care team with respect to Skanik, despite the fact that she has no contact with others of her own species.
- 2.04 The dental and respiratory pathology are severe and following assessment were considered to be linked although this is unlikely to be able to be confirmed until post mortem.
- 2.05 The respiratory pathology would not make transfer impossible but it would be highly likely to carry the risk that she could potentially die on route. If to be undertaken it would require meticulous planning and ethical consideration balancing the perceived welfare compromise of a lone elephant verses the perceived risks of the respiratory compromise – both are unknowns.
- 2.06 The current level of care, both behaviourally and physically, are excellent and provide Skanik with a range of choice and stimulation. In addition, she has a firm bond with her keeping team that is long-standing and consideration of any potential moves must consider what losing this would mean to her as an individual (generic elephant considerations aside).
- 2.07 Following the review Dr. Cracknell is of the opinion that Skanik would not benefit from being moved from her current situation (but if the elements of her current care were to change then this must be reviewed) and as such the recommendation that the continuance of the exemption remain in place be supported.
- 2.08 It is noted that generic arguments of elephant welfare do apply in certain instances but many of those proposed do not take into consideration the specific challenges and needs of Skanik. It is also noted that concerns of FOIP requests and historical misuse or misquotes of information provided has led to a historical loss or lack of recording of important data but this practice has changed currently with appropriate data documented.

Statement of conflict of interest

- 3.01 The views expressed in the following report are specifically those of the author based on his opinion, experience and specialist knowledge. The author does not have any interests in the financial or operational aspects of either Edmonton Valley Zoo, Edmonton City nor the Canadian Association of Zoos and Aquaria. The author did not receive payment for the following assessment from either Edmonton Valley Zoo or CAZA, except for expenses being covered for travel,

accommodation and meals, with professional time donated.

The author, Dr. Jonathan Cracknell, is a qualified veterinarian with 16 year's experience, 13 of which has been in the field of zoo and wildlife medicine both nationally in the UK and internationally where he has worked on both commercial and (primarily) NGO welfare and wildlife programmes. These have included working for the RSPCA Wildlife unit, Animals Asia Foundation, Free the Bears and many zoological collections and other NGOs. Specifically, with regard to elephants the author has 11 year's experience working with both species of elephants in captive collections and in rescues centres in Asia. This has included being the veterinary advisor to the BIAZA Elephant Working Group, EEHV Veterinary Advisor to the SSP, and a member of the Global Elephant Management Programme and the IUCN Wildlife Health Specialist Group. He also has considerable experience of managing single elephants either through the establishment of programmes to manage them in continued lone situations where moves were not appropriate, or preferably in reintegration of single elephants into larger social situations.

For full disclosure the author was requested to examine Skanik in 2015 on behalf of Zoocheck Canada and had communicated with the zoo but the assessment never occurred due to the author having a spinal injury that prevented progression at that time. This was discussed with CAZA when initially requested to undertake this review.

A full and current *curriculum vitae* is available on request.

History

- 4.01 Skanik ("Lucy"), an Asian elephant (*Elephas maximus*) is thought to have been born in Sri Lanka in 1975 and her birthday is taken as Canada day, 1st July 1975 which is the date the zoo opened (albeit in 1959). Skanik arrived at Edmonton Valley Zoo on 19th May, 1977 as an orphan and on her own where she was kept in a situation with no other elephants. Only one other elephant has been found at Edmonton Valley Zoo, Nekhanda ("Samantha") an African elephant (*Loxodonta africana*) that arrived 18th April 1989, when she was considered to be 1-year-old, and where she remained until 30th September 2007 when she moved to North Carolina Zoo, Asheboro, USA. Since then Skanik has been a lone elephant supported by a dedicated keeping team.
- 4.02 There have been considerable attempts by NGOs to encourage the Edmonton Valley Zoo and Edmonton City to have Lucy rehomed over the last decade especially. This has included PETA and Zoocheck taking the City of Edmonton to court which was dismissed in 2010. Principle concerns being the isolation and lack of social contact with other elephants, lack of appropriate environmental conditions in winter, and perceived lack of medical diagnosis and biased medical reporting. There are considerable numbers of facebook, social media and websites dedicated to "saving Lucy" and she has become the face of lone elephants and a point of comparison globally.

Materials & Methods

- 5.01 The following assessment attempts to be balanced and comprehensive in the scope of its assessment, taking into account the basic requirements of CAZA Standards, stakeholder interests, legislative compliance, and most importantly the perceived needs of Skanik herself. Whilst all attempts have been undertaken to ensure that comments are evidence based there are areas that have to be subjective and comments are based on the express opinion of the author and do not reflect those of other parties, unless stated. The assessment has utilised multiple sources and has resulted from a combination of the following methods:
- Complete physical examination over four days, the primary collaborative examination being undertaken on the 20th June with Dr. Jim Oosterhuis DVM and the collection's veterinary team. Other opportunistic examinations were undertaken whilst shadowing the elephant team as Skanik walked about the zoo or was in the house in different scenarios.

- Review of her historical and current medical records which consisted of 889 pages of electronic records; 10 specialist independent reports, photographic documentation (both current and historical where it existed or was available) and several ancillary related documents.
- Review of Skanik's distal limb radiographs, consisting of 84 radiographs.
- One full day and three partial days shadowing the elephant team through Skanik's daily routines including general husbandry, medical procedures (including foot care), demonstrations, walks in public areas, off show free and play time, and enrichment processes.
- Interviews with senior, middle management, keeping and veterinary staff with regards to Skanik's care and management plans, including historical context, long term plan and possible opportunities for rehome or maintain on site where appropriate.
- Review of elephant management policies and related documentation on site from the last decade.
- Review of external NGO public domain documentation with regards to Skanik and concerns noted, including campaign for release material.

5.02 The author would like to thank Edmonton Valley Zoo for their openness, transparency, access, trust and full disclosure with regards to the access to documentation, opinion and archived materials made available during this assessment. All materials were returned to the collection on completion of the report, along with copies of any images taken during the assessment.

Veterinary historical medical record

- 6.01 The medical history notes are variable in quality and content - primarily this was due to concerns about FOIP and the subsequent responsible or irresponsible usage of the records by external parties. As such there are gaps in the records and some of these were filled following interview and confirmation using multiple sources rather than relying on individual verbal accounts to ensure robustness of commentary.
- 6.02 Skanik is a middle aged female Asian elephant (*Elephas maximus*) nearing 41 years of age with an estimated date of birth of 1st July 1975. Recent medical history only is documented to ensure current medical findings are put in context, where deemed necessary prior to 2000 is noted but the following focus reviews in detail the last 15 years of medical history.
- 6.03 Skanik has had ongoing dental pathology noted since 2005 with a deviated right maxillary molar and associated dental pathology, this tooth was lost 08/09/09 but has resulted in major maxillary and likely other bony changes and conformation to that region of the skull which continues to this day and is evident in the changes in the deviated soft/hard palate.
- 6.04 In 2011 there were concerns noted with the left maxillary molar which had become impacted and failed to shed in the normal fashion – this continued for just over 12 months before the rostral aspect was lost in 2012. The left maxillary molar appeared visually to have normal alignment in 2009 through 2012 but exhibited crowding of the centre line with the 2013/14 examination showing the early signs of a new molar coming in perpendicular to the fifth molar, which was confirmed in 2015 with the loss of the fifth molar and the deviated molar being clearly visible.
- 6.05 Respiratory concerns or gross clinical signs were sporadically noted from 2000 to 2004 with discharge from the trunk being noted. Respiratory sounds were first mentioned in 2004. Initially lying on the left side resulted in laboured breathing and this progressed to mouth breathing when standing, exacerbated on exercise. The first trunk scope was in 2004 but the nasal flexure was not reviewed or passed until 2009 and subsequently since that time. Breathing deteriorated over 2005 and copious white mucoserous material passed with open mouth breathing being mentioned as a major concern in 2005. Discharge colour varied but was primarily white with occasional reports of green or yellow, especially during 2006-2007 but also more recently on one occasion. The end of 2010 saw the open mouth breathing increase in frequency at rest and severity exacerbated by exercise. Since then variable respiratory signs and trunk discharge have been reported but were consistent in severity. Lateral recumbency increases labour of breathing and clinical picture on

either side but still left lateral recumbency is considered to be worse than when she is in right lateral recumbency. No firm diagnosis as to cause of the clinical picture but trunk endoscopy shows narrowing of the airways caudal to the ethmoid. Whilst not confirmed the clinical notes appear to demonstrate increases in clinical severity that mirror changes in dental pathology or there is a direct, if not staggered, correlation when considering the maxillary movement of the sixth molars.

- 6.06 In 2002 Skanik fell on to her right hip and this resulted in an abscess forming that was managed as an ongoing process until early 2005 where it finally appears to have resolved.
- 6.07 Skanik exhibited considerable, primarily fore feet, orthopaedic problems that were in their peak in 2000-2003. Since then these have been well managed and the frequency of foot care reported concerns has dwindled over the last decade to almost being non-existent in the last 2-3 years. Primary foot concerns were (and are still ongoing):
- Right fore – digits 3 and 2 most severely affected, also pad abscessation noted
 - Right fore carpus – arthritis (mild), moderate soft tissue concerns and considerable reduction in ROM noted periodically and reoccurringly
 - Left fore – digits 5 through 3 noted to have problems over the years
 - Left fore carpus – severity less than the right but noted reoccurringly
 - Left elbow – swollen and stiffness noted
 - Right hind hip – fall and associated abscessation and muscle atrophy (see above)
 - Left hind – intermittent click from hip/stifle, likely soft tissue i.e. tendinous
- 6.08 Overall picture was extremely guarded in first part of the 2000 decade with severe foot pathology but well managed by the team and quality foot care programme has resulted in resolution of the majority of the problems noted early on with occasional mild issues noted in the records more recently. Orthopaedic concerns with proximal left forelimb and distal right forelimb now permanent compromise but well managed with long standing physiotherapy and exercise regime combined with multiple substrate use.
- 6.09 Radiography reviews of the distal limbs, total of 84 radiographs reviewed, were generally unremarkable. There is a mild arthritis of both fore carpi with small numbers of osteophytes on the lateral and dorsal aspects of the carpi. There is little osseous pathology noted on the metacarpals nor phalanges. With regard to the fore third phalanges (P3) there is normal calcification of the cartilaginous components of P3, most of which is complete with some incomplete. There is no active or concerning evidence of osteoarthritis nor osteomyelitis, except on LF D3 P3 where there is historical new bone formation on rostral aspect of the bone and calcified lateral extensions, this appears to have originated from the foot issues over a decade ago and little has changed. Finally, there is some lateral elongation of the diaphysis of the first phalanges on both fore feet – this is likely related to the slight valgus conformation of the forelimbs.
- 6.10 Other intermittent issues noted, primarily colic thought to be associated with long-term NSAID use but all managed well and not considered a problem at time of the review.

Veterinary health assessment

- 7.01 Veterinary health assessments were undertaken over four days from the 19th to the 22nd June 2016. The complete physical examination being undertaken in conjunction with Dr J Oosterhuis and the collection veterinarian on the 20th.

SUBJECTIVE

- 7.02 Skanik is a bright, active and alert middle aged elephant with a long history of dental disease, significant respiratory disease and arthritis and pododermatitis predominantly of the forelimbs.

OBJECTIVE

- 7.03 Overview: Skanik is in excellent body condition with good muscle mass and general conformation except for slight valgus rotation of the distal forelimbs. Her body condition score is 3.5/5 and she is towards the top end of the weight for her size at 3992kg.
- 7.04 Skin: Skanik has near perfect skin for an elephant of her age. There is little to no thickening nor lesions, except for a small area over her dorsal pelvis and head but even this is mild. There is a small amount of callous over the elbows but this has reduced over the last decade when reviewing old photographs. There is a small blemish on the caudolateral right elbow where there is some pink skin visible but the area is only approximately 15mm in diameter, as well as a similar punctate lesion over the right ventral hip area. These are both considered to represent old pressure sores but neither are active and are now simply scarred areas. The temporal glands were dry and clean although the left had a small amount of white material visible when expressed, this was not considered a problem. She has reasonable hair coverage across her body and her tail has a surprisingly large amount of hair for her age. There is no evidence of folliculitis or other dermal related pathology. Her tail has several lateral kinks in it and on radiograph appear to be a result of historical tail fractures – these were present on images when she was younger and likely reflect fractures at catch up or crating when she was initially sold (speculative).
- Skanik was noted to scratch her body at a frequency that was considered to be bordering on excessive but there were no obvious lesions in the areas that particularly seemed to affect her, this was put down to the large number of mosquitoes that had erupted in the last two weeks but could equally represent underlying allergies or other pruritic dermatopathy.
- 7.05 Eyes: Skanik's eyes were both bright and clear with no corneal lesions, cataracts nor ocular deposits or masses present on examination. She had a normal amount of tear overflow and did not exhibit blepharospasm. Her eyelids exhibited normal function and had significant numbers of long eyelashes present. The skin around the eyes was clean and unremarkable. She was able to visualise food and other objects easily.
- 7.06 Ears: Both pinnae were complete and considered normal condition with a reasonable amount of hair being present. Her ability to hear appeared normal and she could respond to verbal commands well.
- 7.07 Trunk: The trunk was complete with no lesions nor signs of trauma externally. The skin being smooth with large numbers of short hairs present. Skanik has excellent trunk dexterity and wide range of movement from general usage through to fine manipulation of objects around her. The visible end of the nares is normal with considerable pink colouration. On inhalation the nares rostral to the flexure visibly inflate – this appears to be consistent when not orally mouth breathing – believed it is an adaptation to facilitate air flow through the nares. Scoping (both historic and current) of the trunk reveals relatively normal anatomy – the nares rostral to the flexure are smooth with variable amounts of detritus and cellular debris; the flexure appears normal and may have been noted as a constriction on previous assessments – this is a tight muscular flap involved in respiration but also allowing water to be retained in the trunk for drinking; the nasoturbinates and ethmoturbinates appear normal as does the surrounding nasal cavity; and then, at the full length of the scope, the nasal cavity becomes narrow with considerable cellular debris and variable white frothy material blown rostrally on exhalation, on some of the endoscopy videos the white fluid appears to collect in the ventral nasal passage rather than drain into the nasopharynx, suggesting that the obstruction is ventral/ventrolateral in the caudal nasal passage/cranial nasopharynx. Visualisation not being possible due to the caudad nature of the lesion at the extent of the scope's length (3m). This location would be consistent with the maxillary canine in wear/germinal junction as they come into the

mouth. In all of the endoscopy videos the mucous membranes have appeared normal when seen through the white mucoserous material.

Cytology of nasal discharge – smear and diff quick staining – was undertaken in house and was unremarkable. There were rafts of oronasal bacteria in a mucoid matrix with occasional leucocytes.

- 7.08 GIT: There is considerable dental pathology currently in Skanik's mouth. She has no incisors (tushes) which can be normal and likely is in her case. She appears to be on her last set of molars (sixth) with the remnants of the fifth being only in the right mandibular quadrant (possibly the left also?).

The right maxillary molar exhibits malposition with the tooth rotated medially dorsally and laterally ventrally, at an angle of approximately 20 degrees with the dental plates in a normal position (perpendicular to the sagittal plane). There is considerable gum recession rostrally with a large part of the rostral leading edge being visible, there are a small number of caries present. The rostral three dental plates exhibit abnormal wear patterns and have had the medial edge worn at a 45-degree angle, whilst the rest sit with the medial edge longer than the lateral, an effect of the rotation. The dentine is shallow with the enamel projecting above the surface of the tooth, more so on the lateral edge – a result of malocclusion and abnormal wear with the opposite tooth. The tooth appears to be stable but the full length could not be confirmed.

The right mandibular sixth molar was difficult to visualise but appears to be relatively normal in appearance and position, although it appears that the tooth meets the maxillary molar at an angle. The fifth right mandibular molar remnant is approximately 8-10cm in length and projects dorsally at the ventral end, there is mild movement present and is expected to be lost in the next 6-12 months, if not sooner with assistance as requested by Dr Oosterhuis.

The left maxillary molar is equally difficult to assess as the right. Whilst this exhibits similar rotation with the dorsal aspect of the molar deviating medially the tooth itself exhibits 90-degree rotation with 4 dental plates being visible and parallel with the sagittal plane, it is unknown if there is normal molar, malpositioned molar or no molar behind this rostral piece. There is a large sulcus rostral to the tooth and a small area of necrotic tissue likely associated with the loss of a piece of dental plate recently.

The left mandibular molar appeared similar to the right with a rostradorsal curve at the rostral part of the tooth – it is possible that this is the remnant of the fifth molar but this could not be confirmed by palpation and the whole tooth was rigid in the mandible.

The hard palate and the soft palate covering appears to be bulbous and deviate to the left side with a thick crease down the midline, close to the left molar. This is in line with the base of the trunk and the deep sulci rostral to the molars make this appear to be more prominent than it is. The deviation however is pronounced and is hypothesised to be a result of plastic bony changes as a result of the malpositioned right maxillary molar and previous dental pathology. The tongue also deviates to the left although there were no lesions on the tongue itself.

Skanik has developed large jowls that hang over her rostral mandible, these are simple extensions of the buccal cavity and the cause is not clear. It is possible they are a result in changes brought about by the dental pathology, increased pressure differentials through oral mouth breathing or some unrelated reason. Water tends to pool in them but she is capable of emptying them if needed.

The faecal balls were of reasonable size and consistency with good fibre length demonstrating that Skanik can masticate food presently despite the oral pathology. The number of faecal balls was considered normal for an elephant and the team confirmed that

the number was normal for her (they count them each day). The anus appeared normal with pink mucous membranes and no obvious pathology noted. There was no signs of bloat nor abdominal distension and gas was infrequent and considered normal in volume.

7.09 Respiratory: See trunk section for upper airway.

Skanik has considerable airway pathology that results in an extremely loud expiratory noise and a slightly less inspiratory sound. The level varies, as likely the source, whether it is open mouth breathing (louder) or via the trunk (quieter). It is considered that the nasal breathing sounds are referred from the caudal nasal cavity, and those of the oral breathing are reverberations of the soft palate as elephants are typically obligate nasal breathers and to breathe through the mouth is considered abnormal and unusual. There were no abnormalities found on palpation of the perilaryngeal area. The thoracic movement was considered abnormal but consistent, with extremely slow, deep and drawn out respiratory patterns. A normal respiratory rate would be expected to be 10-12 breathes per minute, whilst Skanik's is generally 2-3 breathes per minute whilst resting, increasing up to 5-6 with gentle exercise, but with an increased oral component as well as increased noise. It is hypothesised that both the nasal and oral breathing results in considerable turbulent flow rather than the more usual laminal flow and results in both increased noise but also aerosol deposition, fluid build-up and airway irritation which would account for the serous/seromucous white nasal discharge that is often observed, especially at exercise. When climbing relatively steep hills or when she lies down the amount of fluid released from the trunk is considerable, suggesting that there is an area within the skull where this material is pooling and passes out when the angle of the head is acute.

There were no abnormal lung sounds noted, although they may have been hidden by the considerable upper airway noises.

7.10 Cardiovascular: Normal arteries and veins were noted on the ears and the fore and hind limbs. Auricular and forelimb pulses were present and considered normal. No further assessment was made.

7.11 Urogenital: The vulva opening was normal and no masses were felt on palpation of the vestibule (through the 'perineum'). Copious urine was passed in normal volume and normal frequency. A bloody plug was passed on the 22nd June but was lost in the fields. Skanik has passed a number of bloody vaginal plugs and cytology has been unremarkable. It is hypothesised that these are a result of the likely presence of leiomyomas considering that she is nulliparous and their presence is likely. Ultrasound to confirm was not undertaken but has been recommended that be done following a period of desensitisation for the procedure to be undertaken. Mammary glands unremarkable and no masses or concerns noted.

7.12 Musculoskeletal: Skanik has a mild (approximately 10 degree) carpal valgus bilaterally which results in the toes pointing slightly outwards, with the right more obvious than the left. In addition, there is slight lateral bowing of the radius giving a slightly bowlegged appearance on the forelimbs. She is well muscled and is in good condition as well as being physically fit, albeit oxygen compromised due to the respiratory pathology which limits her exercise depending on how the breathing is each day. Of note is the slight, intermittent clicking sound emanating from the left proximal hind limb – possible the stifle or hip but assumed to be tendinous in origin and inconsequential.

Her feet and pads are in general in excellent condition which is a result of an active, well maintained foot care programme combined with daily exercise and variable substrates under foot. Her cuticles were in excellent condition on all feet. The nails were generally also very good with very minor cracks at the edges of the toes which were considered inconsequential, the only lesion of note being on the nail-pad junction of right fore digit three (RF D3) which was superficial but irritating for Skanik. The fore pads were a little thin and too smooth as a result, limiting traction but also meaning that she was more

sensitive to gravel or other foreign material under foot – however it is noted that this was not apparent when walking out in the zoo and grounds. There is a small deficit on the caudal aspect of the right hind where the pad meets the skin but again this was considered incidental. Overall her feet were in excellent condition.

The right carpus had a slightly reduced range of rotational movement compared to the left as well as a reduction in the degree of flexion but this was subtle and still considered to be low grade in impact. Whilst she does have arthritis present in the carpi it was considered mild. The left shoulder did exhibit some stiffness on some of the walks and did result in a change in gait on the occasional walk. This is noted as being supported with analgesia as well as laser therapy and a very active and well considered physiotherapy programme of stretches and activities.

Thermography of the limbs was unremarkable.

7.13 Neurological: Skanik did not exhibit any proprioceptive nor neurological clinical signs. In addition no stereotypies were noted during the whole period of review which was considered a major achievement by the elephant team with an elephant on its own. Cameras were set up overnight and footage reviewed and even without the presence of staff to stimulate Skanik there were no noted stereotypies seen.

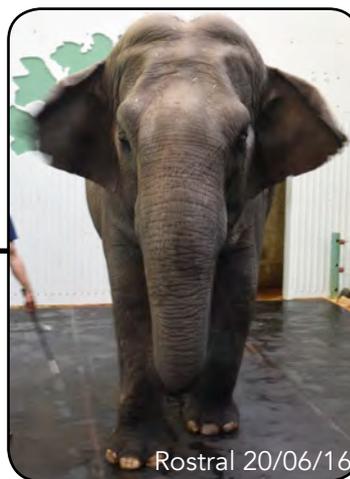
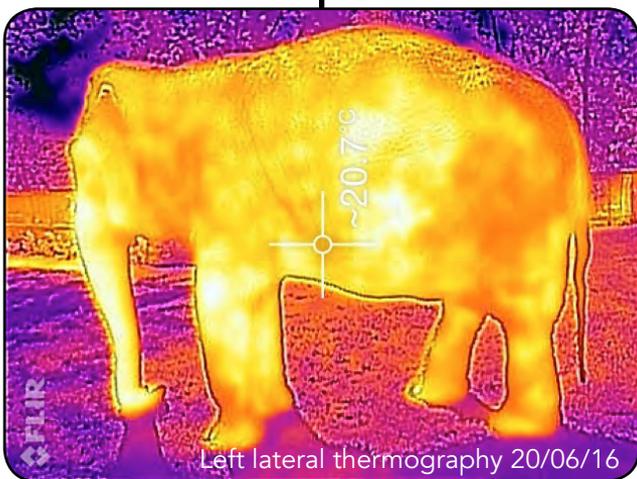
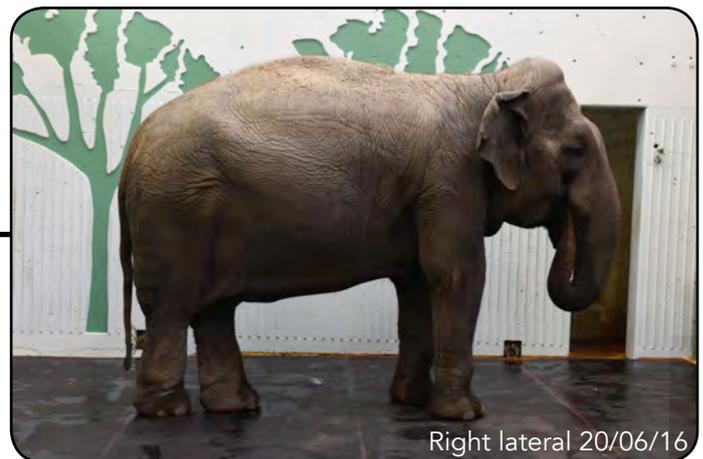


FIGURE 01: DENTAL PATHOLOGY

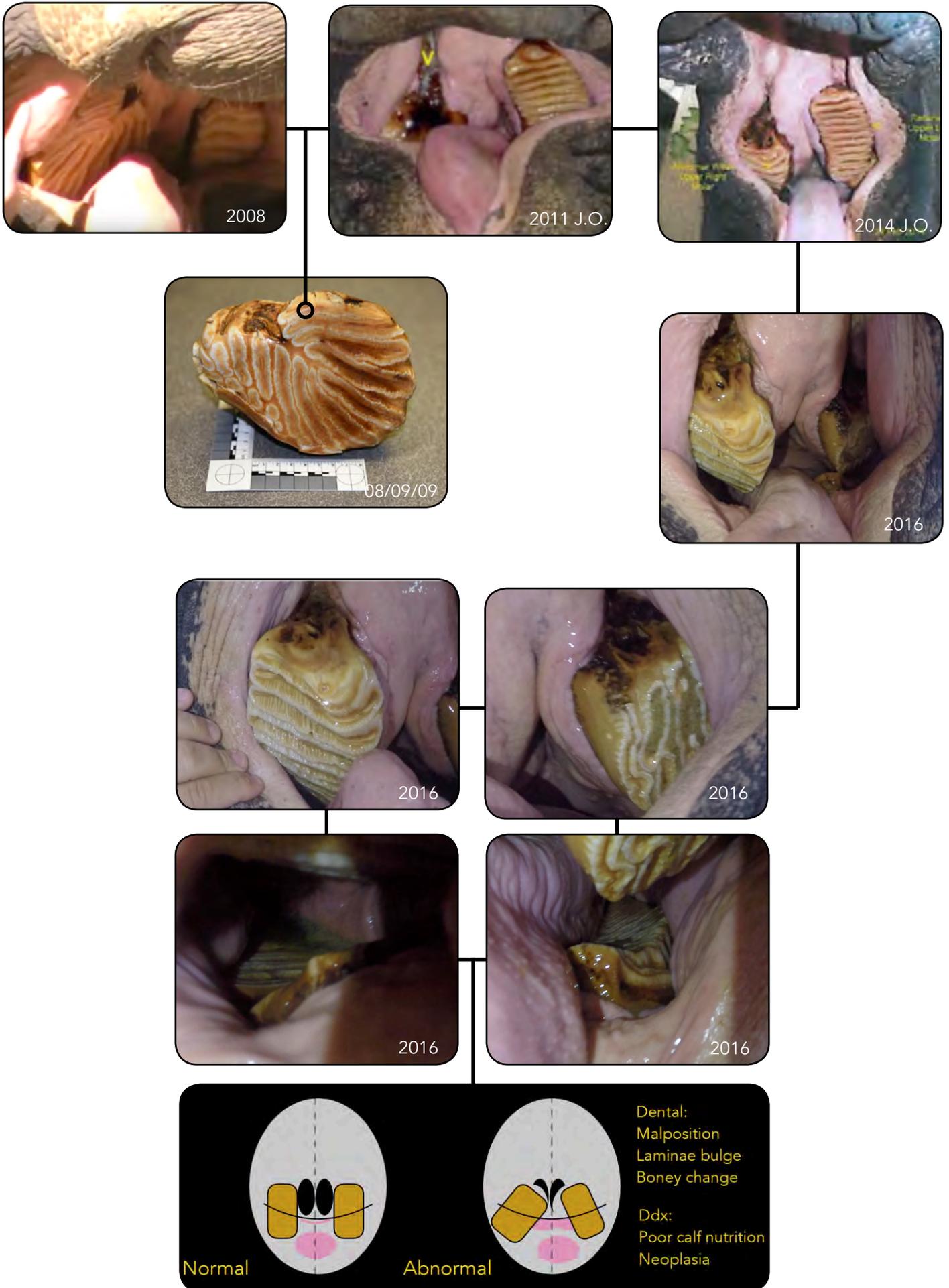
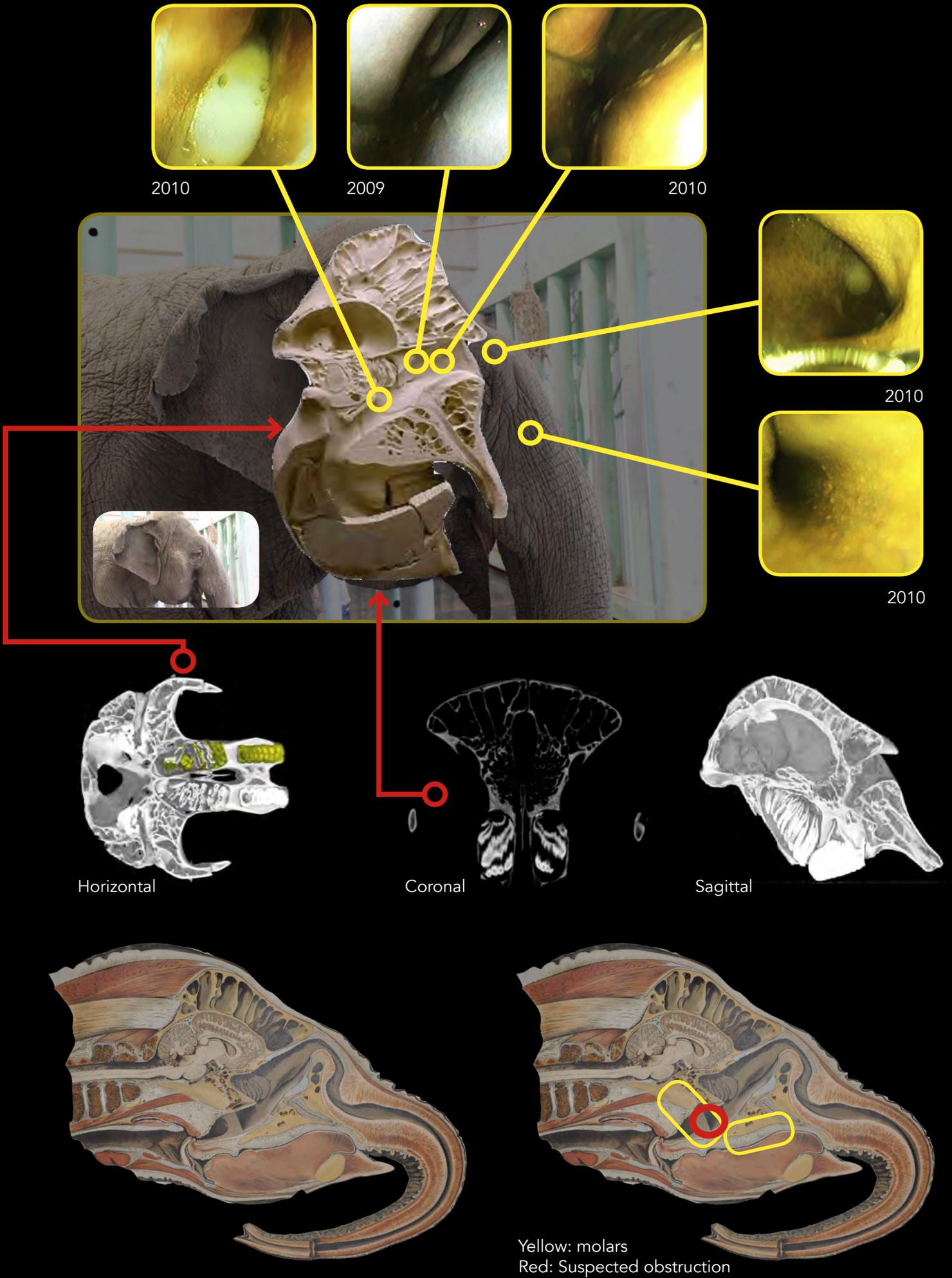


FIGURE 02: UPPER RESPIRATORY TRACT SUMMARY



Behavioural provision

- 8.01 Skanik is a middle aged elephant that is maintained on her own. This has been the case for the first 12 years of her life at Edmonton Valley Zoo and then again from 2007 following the institutional transfer of Nekhanda the African elephant to North Carolina. This raises concerns for the behavioural welfare and social well-being for Skanik as elephants are exceptionally social animals and must be maintained in social herd networks with very few exceptions.
- 8.02 Skanik is an unusual elephant in an unusual situation. Whilst elephant-elephant social contact can never be replaced by elephant-staff interaction Edmonton Valley Zoo has developed a programme of both physical and mental support for Skanik which involved multiple stakeholders and investment. The zoo providing a minimum of two keepers with her at all times and these are rotated at regular points of the day with a minimum of four staff interacting with her on a daily basis. The behavioural support composes of an active programme of enrichment, behavioural consideration and periods of free-roaming in off show areas of the zoo.
- 8.03 Skanik is managed in free contact and most interactions being through verbal or tactile queues although there is always the presence of the ankus or elephant hook as required by CAZA and associated standards. The ankus was used very rarely and even then most times the handle end was used instead of the hook itself. Skanik has an exceptionally strong bond with the staff and interacts in a variety of fashions depending on the staff but at all times there is a mutual respect between Skanik and the staff, albeit Skanik is always looking to do what she wants to do and see what she can get away with especially in the off show areas.
- 8.04 The facilities of the central elephant house are average at best and the additional scope provided by working with Skanik in free contact allows a massive improvement in the quality of her life, through access to substrates and varied landscapes and evolving environments that would not be accessible to her if she were to remain in the house only or went into protected contact.
- 8.05 Due to the close relationship shared by the elephant team and the dedicated focus of the staff only on Skanik's behaviour and needs has resulted in a comprehensive care programme that evolves and adjusts to Skanik's behaviour, physical condition or other social needs for Skanik. In some respects this does mean that Skanik is doted over and often gets her own way, however it has resulted in an exceptionally well managed, if not poorly documented, social provision and adaptable enrichment and behavioural support system that is unparalleled to any that I have seen in other collections, including those with lone elephants.

Behavioural assessment

- 9.01 Skanik was active and intelligent, wanting to interact and sometimes test new comers to the house. She is extremely aware of her surroundings and was keen to investigate any changes both in personnel but also in the setup of her enclosure e.g. she went straight to the go pro set up for the night time video assessments.
- 9.02 She is an intelligent animal and this makes provision of an appropriate enrichment and stimulating programme especially challenging. This challenge is well met by the elephant team who actively work to provide Skanik with opportunities as well as free time for her own exploration when out in off show areas of the park. The variety of enrichment provision was wide and innovative, with provision sometimes taking into consideration how she was behaviourally or physically, sometimes focusing her on the occasional period where she was distracted or going through the motions. This was noted the day following the sedation for the trunk endoscopy where she was still tired.
- 9.03 Physically she is in good condition and again this is a reflection of the wide provision and off show environments made available through her walk abouts around the zoo. This is well managed and staff are present, sometimes with additional interpretation guides, to ensure that visitors do not

crowd her and are preferably maintained at a distance of 20 feet or so. This was well managed both for Skanik and the public's safety. At no time did Skanik appear to be perturbed or respond to the members of the public, she being mainly focused on securing off show grazing access.

- 9.04 At no time during the full assessment period did Skanik exhibit any form of stereotypies. During the husbandry programme this was considered to be down to the active support and management provided by the staff. At night when this was removed there was equally no stereotypies noted on camera although there were times when she was not visible on the camera set ups.
- 9.05 Despite being listed in the Elephant Management Policy chains are not currently used as a management tool and the team could not think of a scenario where they would be used. Everything that was undertaken during the assessment was done so without the use of chains, including the endoscopy which demonstrates the trust between all parties involved.
- 9.06 Historical trained behaviours or activities have evolved to behaviours that only benefit Skanik and where they could compromise her either physically or demean her then these have been phased out, albeit some of them only recently in the last two years. Unilateral two leg stand, riding, trunk lifts and other such behaviours are no longer practiced. She does paint but she can terminate this at any time and is reported to enjoy it, having painted the inside of her dome. Note – these are sold to support the conservation arm of the zoo, not as a primary commercial activity.
- 9.07 The social and behavioural management is critically linked to the team members and the collective relationship and intimate knowledge that they share with her. Whilst this can never replace the elephant-elephant interactions nor species specific relationships Edmonton Valley Zoo has provided the next best thing, where they could just as easily have managed her as a show animal. They do not and invest an incredible amount of resources, time, and support to ensure Skanik has the best possible quality of life available with the resources of the zoo.

Assessment summary & considerations

PHYSICAL HEALTH:

- 10.01 The dental pathology is clearly visible and long standing with at least 11 years of pathology noted by this review but likely to extend further back in Skanik's history and possibly even related to dietary management as a calf when elephant calf rearing diet knowledge was poor (1970-2000). This has resulted in severe plastic changes to the teeth and the surrounding bones of the maxilla that can be seen per os. It is highly likely that these visible changes extend into the sinuses and the nasal passages and are the cause of the respiratory problems, although this is hypothetical and likely will only be confirmed at post mortem. However this supposition fits the clinical picture and the historical aspects of her condition.
- 10.02 The dental pathology will require active management for the remainder of her life and this will be facilitated through free contact and possibly even require full general anaesthesia to manage the retained and/or malpositioned molars. Even with surgery the changes to the skull (if present as suggested) are highly unlikely to resolve and this is permanent, although may plateau.
- 10.03 The respiratory compromise noted is variable but only due to the well managed programme and attentiveness of the keeping staff. If the hypothetical scenario outlined above is the case then the plastic changes brought about by the dental pathology likely extending into the nasal passages are the likely cause of the respiratory clinical compromise noted. However neoplasia of the airways cannot be ruled out – it must be noted that this is extremely rare and that the history and lack of cellular pathology on the nasal discharge is not consistent with the clinical picture found on assessment. If dental, which is supported by the clinical history, it is likely that this will be slowly progressive until the final molars have progressed into position where the respiratory pattern will plateau, preferably prior to complete obstruction of the nasal passages (thought

unlikely). Secondary infections of the lungs or secondary cardiac pathology may result following the abnormal respiratory passages and airflow, especially the changes in pressure across the respiratory tree.

- 10.04 Foot care shows a massive improvement over the last decade to a point where she has excellent conditioned feet and soles. The historical arthritis lesions are considered significant but mild. These are well supported with the physio programme and ancillary aids such as laser therapy and other traditional and non-traditional methods.
- 10.05 Her carpi and left shoulder compromise are likely permanent but active management means that they are unlikely to progress unless something catastrophic occurs.
- 10.06 Skanik's kinked tail is a historical lesion and is unlikely to change. It does not cause any welfare concerns.

MENTAL HEALTH:

- 10.07 Skanik is maintained as a lone elephant and has been for the last nine years.
- 10.08 She is active, intelligent and has a wide range of activities and opportunities provided for her on a daily basis from a committed team that are devoted to her needs.
- 10.09 No stereotypies were noted during the assessment period both when present or when reviewing remote footage out of hours.
- 10.10 The active behavioural consideration and management was impressive and Skanik benefitted hugely from this level of care and provision.

CONSIDERATION:

- 10.11 Skanik is a middle aged elephant that is maintained on her own at Edmonton Valley Zoo. This is not an acceptable position and a generic elephant must be maintained in suitable, social surroundings in numbers sufficient to meet their social and behavioural needs. However, Skanik is not a generic elephant and consideration must be given as to what the limitations are of her medical needs, her needs as an individual, and her physical capabilities to ensure that the behavioural and social needs are met with any programme that is designed for her, be it at Edmonton Valley Zoo or at another facility.
- 10.12 In reviewing Skanik over the last few days, the supporting medical documentation and policies of the zoos against the backdrop of the valid points and some not so valid points raised by external parties that wish to 'Save Lucy' it is clear that the current situation provides for her current physical needs and to some degree her mental needs, assuming the gold standard would be positive social interaction with another Asian elephant. The primary concern is what does Skanik need to have a complete and fulfilling life at any facility – this comes down to an active management and support programme for her dental and respiratory pathology as well as the mild orthopaedic complaints which are extremely well managed at Edmonton. This needs to be balanced against the social and mental provision that Skanik requires, this would preferably be with others of her own kind.
- 10.13 However the physical pathology presents a major risk to considering a move for Skanik. Whilst not impossible a move would carry a grave and unquantifiable risk to Skanik's life and the question ultimately falls to whether the lack of social interaction with species of her own kind and the seasonal challenges found in winter is of greater welfare compromise than the risk of her dying if attempting to move her.
- 10.14 Secondly where could she be moved to – there is no clear and obvious choice as a possible home for Skanik to go to if she were to be moved. The sanctuaries in the USA would be an

obvious choice but Tennessee Elephant Sanctuary does not have the handling systems nor culture required to manage Skanik's problems which require active management. Similarly, the same could be said for Ark 2000 although they have a much more active veterinary support programme and are more hands on in a protected contact situation. However, there are limitations with even this facility such as space, social interactions and a smaller team where the human contact would not be possible to emulate that currently found at Edmonton, however perhaps this would not be needed assuming she entered a positive social relationship with other elephants. Other zoos could be considered however most are now operating protected contact management systems and Skanik needs proactive support and management, some of which is facilitated in free contact (but not impossible in PC) or have larger herd sizes where again she would lose the focused attention that the physical elements require with the modulation of her care programme changing in response to her condition on a minute-by-minute time frame. There simply is no obvious choice if transfer was considered that would meet all of her needs. She should be with other elephants but she also needs an active medical support programme comparable to what she currently has and I believe that this takes precedence at this current time.

Alternative options

11.01 Euthanasia

Skanik does have severe dental pathology and chronic respiratory impairment that is progressive and is highly unlikely to resolve. Whilst euthanasia on welfare grounds could be argued as an option I cannot recommend this at the current time. She appears content and pain free as well as appearing to not be distressed by her respiratory condition. Behaviourally she equally appears to enjoy interacting with the elephant team and whilst she obviously knows she is an elephant she subjectively appears to treat the senior keepers as part of her herd. This does need to remain as a consideration and criteria should be considered on welfare grounds when euthanasia was indicated.

11.02 Bring in another elephant or more to Edmonton

Skanik would benefit from elephant company, that is not in doubt. However, it is not a simple case of bringing in another Asian elephant. The two main considerations would be a suitable individual that could be managed in free contact and would be viable to be walked around the zoo to overcome the failings of the existing house size limitations which would be exacerbated by the addition of more elephants. The character of the individual would also be paramount as they must be capable of socially interacting in a positive fashion with Skanik but also ensure that any social interactions do not stress and exacerbate Skanik's respiratory condition. This has some advantages but the current facility is not suitable for the management of two elephants, especially with new introductions and as such I cannot recommend this for the current house. In addition, there are political and welfare issues that would be raised with the addition of a new elephant that would be dissatisfactory to external pressure groups (although this is a tertiary consideration).

11.03 Transfer Skanik to a southern elephant facility in the USA

Whilst this is the preferred option to resolve all of the perceived welfare issues it is not a step that should be taken lightly. Currently Skanik has severe medical problems that would present extreme challenges to a move, but they would not make it impossible. The reality is with the current situation the respiratory compromise could lead to respiratory compromise during transportation and lead to her death. In certain situations the risk would be worth it if her welfare was severely compromised but Skanik has a very supportive keeping team, vet team and zoo operational focus that attempts to look after her every need within the limitations of a lone elephant scenario. My personal opinion is that the perceived benefits of a move do not outweigh the perceived negative components of her current situation. However, this may change if the management systems altered in a negative fashion, the senior keeping staff moved on, or her medical condition improved and she was considered fit to travel. This opinion is supported by the majority of the

management and keeping team at Edmonton and if a suitable home was found and she was fit to travel they would not be adverse to her moving.

I support the statements of the previous incumbent veterinarians at Edmonton, supporting veterinary specialists and the views of the management team that to move Skanik as she currently is would be unethical and potentially kill her.

If the situation were to change then consideration must be given to the receiving institution and conditions that must be met to ensure that her welfare needs are met alongside her continued medical provision. I cannot think of a collection that would tick all of the boxes required and compromise must be made – the lone elephant and winter welfare concerns balanced against failings in medical support and one-on-one provision which are likely in any potential receiving institutions.

11.04 Leave Skanik at Edmonton Valley Zoo

Taking into consideration her current condition and the husbandry provision provided by Edmonton Valley Zoo balanced against concerns of lone elephant situations, inclement weather impacts on the management programme and other aspects of this assessment I believe that this is the best option for Skanik in her current condition. The rationale as to why is outlined above. She has an excellent health care programme balanced with an active and focused behavioural support programme that is in tune with her as an individual and goes some way to providing a caring and supportive environment. If in the future the elements of this programme waned then the position should be reassessed but currently I believe that to serve the best interests of Skanik she should remain where she is with some additional components to her care programme as outlined in the recommendations.

CAZA exemption recommendation

12.01 Based on the comprehensive welfare and physical assessments carried out from the 17th June until the 22nd June 2016 I believe that Skanik's best interests would be served if she were to remain where she is. As such I believe the continuation of the variance for Edmonton Valley Zoo should be issued with regard to Skanik, also known as Lucy, the 41-year-old Asian elephant which allows Edmonton Valley Zoo to maintain a lone elephant.

Recommendations for Edmonton Valley Zoo

- 13.01 General: maintain Skanik's excellent body condition and muscle tone but aim to reduce her weight to facilitate the osteoarthritis and respiratory support – in the region of 3,600-3,700 kg would be ideal but note absolute numbers are not important and assessment of body condition is more useful. Weekly weight monitoring may improve focus rather than twice daily weigh ins as currently managed.
- 13.02 Dental pathology: continue to actively monitor her dental development and liaise with Dr Oosterhuis as a specialist elephant dentist as to the options for management, especially considering that these are Skanik's last molars. It is likely that this will require active management rather than passive assessment.
- 13.03 Respiratory pathology: attempt to either try retrograde endoscopy approaching from the oral cavity across the soft palate to visualise the nasal passage obstruction and consider biopsy if appropriate, OR consider the use of a specialist longer endoscope per nasum.
- 13.04 Respiratory pathology: attempt to develop qualitative and quantifiable methods of assessing oxygenation and respiratory function e.g. spirometry, arterial blood gas analysis, or airway pressures to allow accurate assessment of respiratory compromise during rest or exercise.

- 13.05 Respiratory pathology: annually submit normal, as well as opportunistic abnormal, nasal discharge for bacterial and fungal culture as well as cytology.
Respiratory pathology: develop her physiotherapy programme to support extension and raising of the head in an attempt to support drainage of the nares back into the nasopharynx in an attempt to increase airway diameter.
- 13.06 Respiratory pathology: Install automated winches for hay nets or enrichment devices – a minimum of two that are out of reach and periodically, on a timer, drop down to allow access and then return up to prevent them being emptied in one sitting. This will improve physical movement during the day and night, improve cervical tone and trunk movement with an aim to improving drainage of the nares, and will provide an additional enrichment device that will be independent of staff being present out of hours.
- 13.07 Urogenital assessment: train Skanik to accept per rectal ultrasound to allow assessment of her reproductive tract and assess for the presence of uterine neoplasia (if present) as well as consider per vestibule endoscopy.
- 13.08 Orthopaedic: continue the excellent controlled exercise and physiotherapy programme but combine with at least annual radiographic assessment of all four distal limbs including carpi and tarsi using standard techniques.
- 13.09 Process: install CCTV that allow 24-hour surveillance, preferably including remote access, to allow accurate documentation of husbandry programmes, enrichment usage, sleeping patterns (including side preference), substrate use and the development of daily behavioural maps.
- 13.10 Process: review the Elephant Management Policy so that it reflects the culture and actual animal care undertaken on site. The current document does not reflect the positive culture and care exhibited by the whole team nor the central role Skanik's welfare plays.
- 13.11 Process: undertake a review of elephant facilities in Canada and the USA to identify suitable institutions for transfer if Skanik's condition changed and transfer was a possibility. It must be noted that such a review may support the position that no facilities would meet the needs of Skanik. It is possible this could be given to the NGOs to undertake.
- 13.12 Process: recommended that left or right markers are used directly on the radiography plates to ensure accuracy in foot documentation. Recommended that bespoke markers are made to demonstrate if they are fore or hind limbs also.
- 13.13 Process: recommended that foot care is documented photographically and images are labelled as to foot and nail as well as date using markers in the image itself. It is noted that this may not be possible due to historical abuse of medical records when provided to external bodies.
- 13.14 Process: Review any future elephant management policies in conjunction with the WAZA Animal Welfare Strategy (2015).

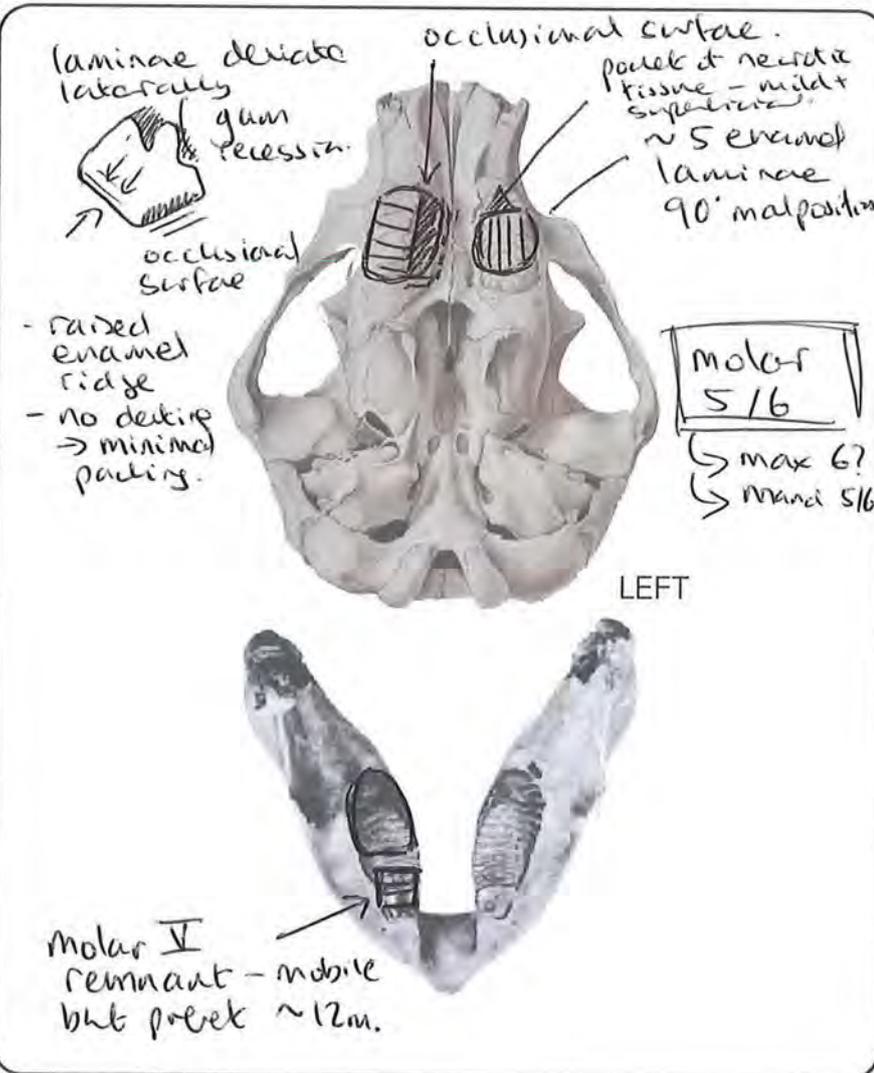
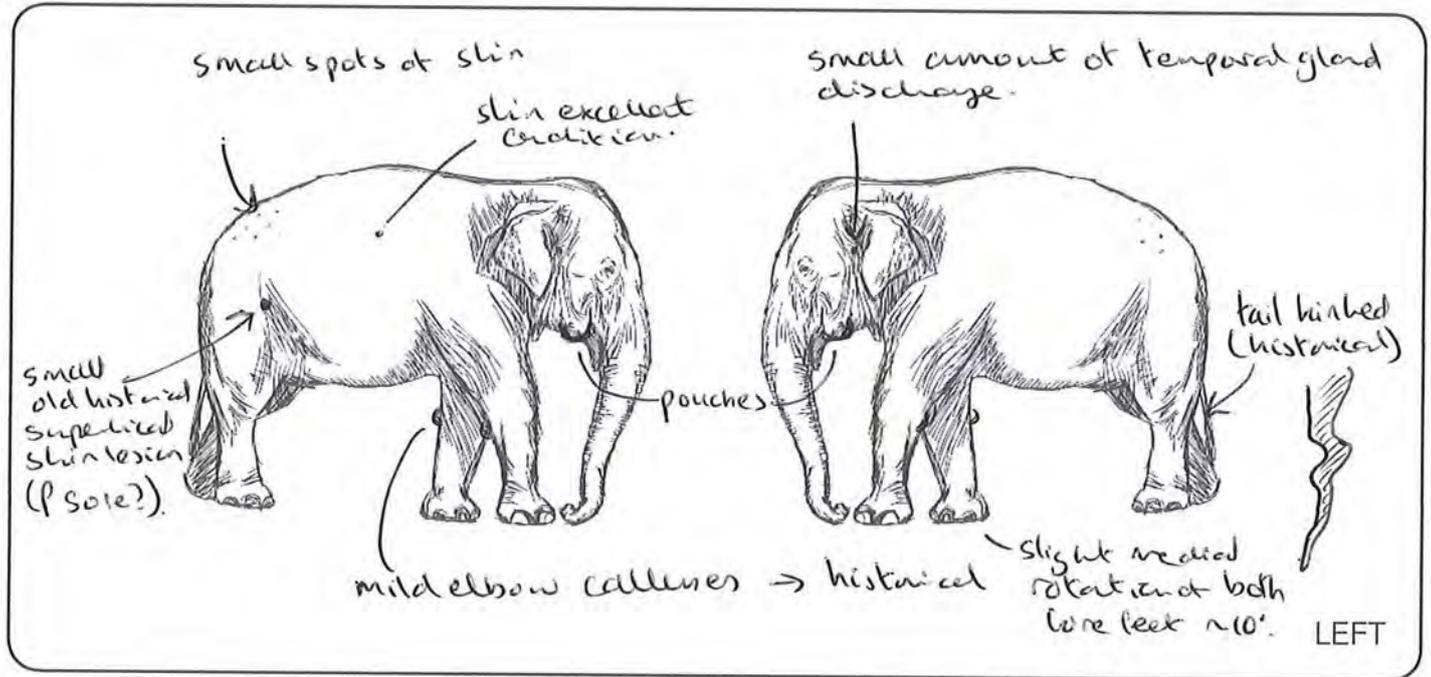
Appendices

- 14.01 Original elephant assessment documentation
- 14.02 Medial record synopses



Elephant Assessment form

Name:	Skanik	Date:	20/6/16.
ARKS:	100003	Filled in by:	JMC
Age:	41 years. DOB: ~1975 (01/07/75)	Vet:	J.O./M.L./J.C.
BCS:	3 1/2 / 5 wgt	Radiographs:	Y/N Hx.



Notes (max.)

- both molars angled approximately 40° to midline → deviation of midline hard palate sulcus to the (L) with considerable gingival recession.
- major maxillary dental pathology → likely (hypothetical) cause of nasopharynx obstruction.





Elephant ID: Shanik

Date: 20/6/16. - 21/6/16.

- Assessment - over several days (18 - 21/6/16).
 - Primary physical 19/6/16
 - J.O. visit + review 20/6/16
 - M.L. endoscopy 21/6/16.

Primary assessment

- subjective - Shanik is bright, active, alert middle aged elephant with a history of resp. disease + dental pathology.
- She exhibited no stereotypies during the entire review + assessment period and has an active husbandry + enrichment programme.

objective

- dermal - Shanik has extremely soft, supple + leion Cree skin except for a slightly thickened area over her right hip (note - correlates with hx abscess - several years previous). Temporal glands were dry + clean with a small amount of white exudate that was expressed easily on the left when palpated. Considerable tail hair present + no evidence of folliculitis. Her tail has several kinks and have been present most of her life → radiographs support # as a young animal → hypotoned @ catch up when a calf. Despite no gross lesions Shanik was relatively itchy → possible mosquito related (currently excise no. → managed with citronella + marigold spray) or possible underlying allergies → consider review.

- BCS - $3\frac{1}{2}/5$ → top end normal, received 2 ↓ wgt 200-300 kg to support resp + low grade OA.



- excellent muscle tone + physically fit → considerable effort in managing + supporting with physio + active/varied exercise regime which is balanced against resp. compromise. She does have an intermittent "tendon snap" that originates from the left hump/stifle but is not considered significant @ this time. There is a slight reduction in the range of motion laterally of the right carpus but this is subtle as is the low grade carpal valgus (approx 10°) of the left + ante-cubital bowing of the left radius + ulna. No variation noted during start, middle or end of walks, even when physical exertion high.
- feet - see accompanying sheet. In general foot care is excellent for age + hx. The fore foot pads are smooth + efforts need to be made to allow them to grow out + have irregular surface much like the hind limbs - some of this is conformation, foot care + substrate related + a long term challenge to resolve. Consider U/S for foot pad thickness on a monthly basis. Otherwise excellent, well managed feet → multiple substrates likely cause.
- head - eyes no corneal defects, cataracts nor deposits noted (note no ophthalmic reflex U/S or otic). Tear flow normal, no ocular pathology nor irritation noted.
- ears - pinnae in excellent condition with no tears, pathology nor discharge. Response well to verbal cues → primary method of communication.



- teeth - multiple, severe dental pathology (see top sheet). Malocclusion + inappropriate postural movement. R max molar - dorsomedial deviation with occlusion on ~ 1/5th medial aspect → raised enamel ridge + carries prob, L max molar - mild dorsomedial deviation but 90° rotation of lamellae, relatively normal wear → caudal aspect could not be assessed, R mand - molar 5 present + loose (but retained > 12m), wear normal, L mand palpated but not visualised. Max molars dorsomedial angulation → narrowing of inter molar space + likely related / part of URT narrowing noted with gingival recession but also deviation noted which likely extends into the skull. Tongue and deviates to the left. However buccal fibre length good + bolus size normal so mastication currently normal (+ wgt maintained). Some food packing in the sulcus + necrotic material where tooth fragments lost (later normal). Shank has large fleshy mandibular pouches - easily cupped + appear unrelated to the dental pathology → likely resp. Plan needed long term (see main review).



Postural view

- respiratory - an extremely loud respiratory noise ~~as~~ on exp + inhalation. She open mouth breathes every 3-4 breathes, ↑ in frequency when exercising. Her resting resp rate is 2-3bpm + deep breathes with slow inspiratory phase. Variable amounts of seropurulent material is passed cytology - mucoid material with some leukocytes + bacterial mats, *Staphylococcus* spp. → normal flora suspected. Endoscopy reports suggest top of trachea blocked but caudal normal + abscess actually in neoplasia caudal to ethmoidal on review → consistent with suspected dental pathology.

- cardiovascular - Veins + arteries appear normal on gross exam, no cardiac eeg nor U/S undertaken on the assessment. Considered normal response to physical challenge + no concerns noted by staff.
- GI - Faecal boles NAD, normal fibre length + consistency + no evidence of parasites noted. No evidence of abdominal discomfort noted. Following DZP standing sedation off food for most of the day but no abnormal ileus nor insufflation noted. Mucosa of rectum NAD - nice + pink. Clean + healthy.
- neuro - good ROM of trunk + fine control, behaviourally normal with no stereotypies noted. No neuro signs noted @ walk, no ataxia nor proprioceptive deficits. Did not sleep well on Sunday night - possible mosquito related or picked up on staff prior to J.O. visit as staff concern re sedation. Enrichment programme + level of stimulation with periods where free to choose impervise + range of enrichment opportunities → bonded with keeping staff + level of interaction + praise impervise.
- urogenital - Urine passed early, freely + appropriate volume + intervals. Noted bloody plugs passed - likely leiomyomas as nulliparous ♀.

Trunk endoscopy 21/06/16.

- diazepam 320mg P.O. 0800hrs.
- 10.00hrs - left lateral oblique recumbent, calm quite + stertorous breathing but rousable.
- 10.35hrs - Right nostril - 1.90m ~ 5ml lidocaine (20mg/ml) applied to Sigmoid flexure ~ level of intermaxillary bones + Nasal cartilage
- 10.38hrs - withdraw scope + wait 5min to effect
- 10.45hrs - R nostril reinsert + review - considerable detritus + discharge over lens but achieved level of the ethmoid + all normal.
- 10.48hrs - removed - depth achieved 2.6-2.7m.
- 10.51hrs - L nostril - 1.90m ~ 5ml lidocaine (20mg/ml)
- 10.54hrs - scope out + await effect
- 10.59hrs - scope back in left nostril, 2.2-2.3m over flexure - stuck in lateral pocket then briefly panned into nasal passage - ethmoid seen, NAD. Removed.
- 11.06hrs - out
- END.

- Also radiographed tail - long exposure time so some movement blur but mid diaphysis # healed visible - very old + likely as young calf as always present.



Elephant footcare and treatment record

Name:	Shanik	Date:	19/06/16.
ARKS:	100003	Filled in by:	JMC
Notes:	Foot care in general is excellent with some older historical issues - well managed.		
Vet check:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Vet:	JC.
Photos:	Yes.	Radiographs:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N -hx.

Right fore

Left fore

Lateral Apical Medial

D5 D4 D4 D3 D2 D2

Notes: Slight deviation of nail horn growth laterally but dense well managed. DIII has two crescs at undermining on solar aspect but well managed.

Tx: XX

Medial Apical Lateral

growth change in keratin

superficial cracks

Notes: generally good foot health - well managed + some superficial cracks -> v: smooth pad.

Tx: XX

RFPad	RFD5	RFD4	RFD3	RFD2	RFD1	Region	LFD1	LFD2	LFD3	LFD4	LFD5	LFPad
/	0	0	1	0	/	Nail	/	0	0	1	1	/
/	0	0	0	0	/	Cuticle	/	0	0	0	0	/
++	⊕	⊕	+	⊕	/	Trim	/	⊕	⊕	⊕	⊕	+

Right hind

Left hind

Lateral Apical Medial

D5 D4 D4 D3 D2 D2

Notes: Foot care excellent, some areas on sole well managed and maintained.

Tx: linear solar lesion midline

Medial Apical Lateral

fracture resected

cracks

Notes: Some solar cracking on edge + sole well maintained - in general excellent foot care + well managed.

Tx:

RHPad	RHD5	RHD4	RHD3	RHD2	RHD1	Region	LHD1	LHD2	LHD3	LHD4	LHD5	LHPad
0	0	0	0	0	/	Nail	/	0	0	0	0	0
/	0	0	0	0	/	Cuticle	/	0	0	0	0	/
+	0	0	0	0	/	Trim	/	+	+	0	0	+

Nail: 0 Normal
 1 Mild: Cracks/uncomplicated/overgrown
 2 Full thickness penetration to laminae
 3 As for 2 with purulent discharge

Cuticle: 0 Normal
 1 Mild: Overgrown
 2 Swelling of the cuticle/loss normal anatomy
 3 As for 2 with purulent discharge

Trim: 0 Not done
 + File only
 ++ Trim
 +++ Resection



Elephant foot radiograph record

Name:	Skanik	Date:	21/06/16.
ARKS:	100003	Filled in by:	JMC
Notes:	Radiographs - historical review with comments regarding fore limbs from 26/04/16 + 02/05/16 + hindlimbs 2009, 2010, 2011.		
Vet check:	(Y)N	Vet:	JMC

2016

Right fore

Notes: In general v. mild osteoarthritis but feet generally good condition.

2016.

Left fore

Notes: In general foot in good condition with only D III P3 to monitor. Some urgency on P2 but no evidence of active lesion.

RFD5	RFD4	RFD3	RFD2	RFD1	Region	LFD1	LFD2	LFD3	LFD4	LFD5
0/0	0/0	0/0	0/0	0/0	P1	0/0	0/0	0/0	0/0	0/0
0/0	0/0	0/0	0/0	0/0	P2	0/0	0/0	0/0	0/0	0/0
0/0	0/0	0/0	0/0	0/0	P3	0/0	0/0	1/1	0/0	0/0

Right hind

Notes: v. mild osteophytes over the tarsus - distal limb NAD - hx review (2009-11)

Left hind

Notes: v. mild osteophytes over the tarsus - distal limb NAD - hx review (2009-11).

RHD5	RHD4	RHD3	RHD2	RHD1	Region	LHD1	LHD2	LHD3	LHD4	LHD5
0/0	0/0	0/0	0/0	0/0	P1	0/0	0/0	0/0	0/0	0/0
0/0	0/0	0/0	0/0	0/0	P2	0/0	0/0	0/0	0/0	0/0
0/0	0/0	0/0	0/0	0/0	P3	0/0	0/0	0/0	0/0	0/0

<p>Osteoarthritis score: 0 Normal 1 Early signs of osteoarthritis 2 Moderate signs of osteoarthritis 3 Severe osteoarthritis &/or ankylosis</p>	<p>Osteomyelitis score: 0 Normal 1 Early signs of osteomyelitis 2 Moderate signs of osteomyelitis 3 Partial or full loss of bone</p>
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Appendix Two - Medical synopsis

16.01 Dental pathology:

07/12/05	Right maxillary molar ulcerated area
15/11/06	recheck tooth hole (presumed right maxillary molar)
20/12/06	left maxillary molar lost portion
19/08/07	browse stuck in right maxillary molar
09/02/08	loose cap anterior mouth – lost (no mention location)
20/02/08	tooth elevated more
12/03/08	sore mouth, right mandible warm
13/03/08	open mouth – submandibular LN
16/04/08	painful tooth, left maxillary molar loose now
24/04/08	right maxillary molar impacted tooth, left mandible (assumed)
30/09/08	malpositioned tooth is aching and she is pushing on jaw
14/01/09	lots of necrotic material around tooth – flushed
10/03/09	tooth bothering her
10/08/09	impacted tooth loosening
19/08/09	large pocket behind the tooth
08/09/09	right maxillary molar lost (note: deformed U shaped molar), large defect, flush with hose for one month
09/06/10	Left maxillary molar pocket – tooth coming out slowly
12/07/10	Left maxillary molar bothering her
16/07/10	Left molar still coming out, also right maxillary molar coming out
19/08/10	Mouth smells bad
15/11/10	>12months since right maxillary molar lost, left maxillary molar coming out as normal, continue to wash mouth out – last set of molars
29/12/10	Right maxillary molar fine, not impacted
02/04/11	left maxillary molar still stuck, off colour and smelly mouth with oral discharge - stick found wedged in side of dental pocket (removed x3)
25/05/11	Right maxillary molar sore
08/12/11	digging at tusk flaps (note – no tushes JC)
10/12/12	Left maxillary molar close to exfoliate
14/05/14	lost left maxillary molar (2.05kg)
23/03/15	dental malformation lower arcades (JO visit)
15/09/15	sour smell from oral cavity
01/12/15	loose tooth (JC – right mandibular molar?)
18/02/16	foul odor from mouth, right mandibular molar trying to shed
24/02/16	painful dentition, also suspect bitten tip of tongue
01/03/16	improved demeanour – tooth loose (left mandibular molar- JC?)
END	

16.02 Respiratory medical concerns – trunk and nasal discharge:

09/02/00	thick mucous discharge from the nares, rumbling from sinuses
29/03/00	purulent discharge from trunk
23/06/04	snuffly and gurgly trunk – some occasional discharge
25/08/04	trunk gurgling a bit
06/10/04	Still wheezing sound – NaCl trunk wash tid x 7days
13/10/04	Wheezing worse
27/10/04	Power wash trunk to flush – recommended external zoo
03/11/04	When lie on left side has more laboured breathing, strong ginger tree
10/11/04	Mucoid material from trunk
24/11/04	Mouth breathing improved a bit
13/12/04	Breathign worse
15/12/04	First scope trunk 110cm scope, trunk only

23/02/05	Open mouth breathing
09/03/05	Mouth breathing
22/06/05	recheck sounds like lots of mucous in the trunk
29/06/05	lots of open mouth breathing when lay down
06/07/05	right trunk congested
13/07/05	trunk copious clear mucous
27/07/05	breathing not as bad but LEFT nostril appears to be plugged
03/08/05	lots of white discharge, feel from one side not both
07/09/05	breathing a lot worse when taken off sputolysin
09/11/05	heavy mouth breathing when walking
23/11/05	heavy breathing
01/12/05	trunk congested, breath smells bad
07/12/05	toonie sized (2.8cm) right maxillary molar ulcerated area, breath smells bad – rotten tooth?
14/12/05	hole under right maxillary molar is longer – flushed
29/12/05	standing sedation scope trunk – bilaterally 200-220 cm reached, small growth and plaques noted and some pus but no diagnostic cause identified
11/01/06	mouth no smell
15/02/06	open mouthed breathing every 3-4 breathes
08/03/06	increased white discharge last few days
24/05/06	very gurgly trunk sounds, lots of white discharge
21/06/06	head resting and difficulty breathing through trunk, mouth breathing when lies on right side
19/08/06	discharge change to yellow colour – concerns pneumonia
27/09/06	trunk discharge increased
15/11/06	variable discharge from trunk from day-to-day
20/12/06	trunk discharge consistent through the day
28/02/07	green trunk discharge
25/04/07	white discharge from trunk, sleeping well
07/11/07	thick white trunk discharge, whistles when breathes
14/11/07	breathing laboured and white discharge
03/12/07	still mouth breathing
25/04/08	Copious mucous passed overnight, whistling through nares
14/01/09	nasal discharge with green tint
10/09/09	JO visit – standing sedation and full examination, left nostril 2.4m and right nostril 2.7m, similar both sides and little to see
14/10/09	Nasal discharge culture – Klebsiella, Pseudomonas and Leclercia, and Candida
09/12/09	Mucous discharge returned
02/02/10	JO visit trunk endoscopy, 270cm both nostrils. Increased labour of breathing but not as bad as previously. Copious mucous present. Cytology unremarkable.
12/07/10	thick nasal discharge for last few days, laid down on walk
16/07/10	less trunk discharge
15/11/10	Respiration still an issue – takes 2-3 breathes per minute to supplement nasal air intake. At walk this increases to 6-10 bpm. Mucous still produced but diminished in volume
26/01/11	Very little discharge for long time, still breathes through mouth though
31/01/11	JO visit, trunk endoscopy, much less mucous, 270cm both nostrils, can see ethmoid turbinates and bulge in both airways, asymetrical. Culture Serratia, Acinetobacter, opportunistic bacteria.
04/07/11	thick mucous from trunk
10/08/11	nasal discharge increased
20/02/12	JO visit – not scoped but similar clinical picture to previous
29/01/13	Very little nasal discharge – only at exercise, opened mouth breathing even at rest, has real difficulty lying on left side, see increased respiratory difficulty
04/12/13	JO visit – no scope of trunk, similar respiratory picture as to before but slight worsening
18/02/14	thick foamy white discharge from trunk, more mouth breathing

23/03/15 JO visit – scoped trunk, 220cm right and 255cm left, narrowing at 215cm (normal flexure), similar to previous, breathing has deteriorated
 16/11/15 thick white foul smelling material passed, sent for culture, Chrysobacterium sp. Isolated, breathing normal but no noise when 'speaks'
 24/11/15 trunk discharge present, thick white material
 01/12/15 trunk discharge
 24/02/16 breathing heavier than usual, a lot of mucous material passed from her trunk
 30/03/16 trunk discharge yellow-green, cultured Klebsiella
 06/06/16 started training for endoscopy
 END

16.03 Right hip fall and subsequent abscess:

14/02/01 Skin crack on hip
 12/09/01 Hot over hip area (JC – right?)
 03/10/01 Right hip warm spot
 31/07/02 Sore over right hip
 16/08/02 Fell during walk, onto right hip
 23/08/02 Lump has appeared on right hip
 28/08/02 Review right hip mass, felt not to be an abscess at this time
 04/09/02 Right hip mass larger and muscle atrophy of the right hind
 25/09/02 Right hip mass reduced in size
 05/11/02 Right hip abscess came to a head, opened at base, approximately apple sized
 06/11/02 Lanced abscess, pack when out
 20/11/02 Abscess better, continue to pack, improved range of movement
 27/11/02 Right hip abscess continues to improve
 11/12/02 Right hip abscess still large hole
 18/12/02 Large amount of purulent material passed
 31/12/02 Less purulent material passed
 08/01/03 Three inch hole into abscess
 22/01/03 Active massage to help pass purulent material
 26/02/03 Right hip purulent discharge still
 05/03/03 Right hip large piece of purulent fleshy material passed (4x10cm), swelling reduced significantly
 21/03/03 Hip abscess fistula
 02/04/03 Right hip copious cottage cheese like material flushed
 23/07/03 Right hip swollen – bottle brush to assist cleaning
 27/07/03 Right hip flared up again, cultured Pseudomonas
 15/10/03 Right hip good
 05/11/03 Right hip swollen again
 03/12/03 Hip tract decreased in size
 10/12/03 Hip doing well
 31/12/03 Hip purulent material passed but OK
 07/01/04 Cavity increased in size again
 25/02/04 Hip OK
 16/03/05 Right hip abscess again
 END

16.04 Foot and orthopaedic management:

Forelimbs conformation noted as bow legged with mild pigeon toe.

29/04/00 RF swollen carpus, possible strain
 10/05/00 RF Carpus stiff but better
 21/06/00 Arthritic and issues when climbing, limit work to a minimum and her choice
 27/09/00 RF swelling decreased but not bending carpus fully

ELEPHANT WELFARE ASSESSMENT - EDMONTON VALLEY ZOO

28/06/01 RH stiff, has hard time getting up
11/07/01 RH, favouring LH
12/09/01 RH stiff again – consider acupuncture
01/11/01 LH stiff and trouble stretching and getting up
14/11/01 LH still stiff but found foreign body in sole, removed
02/01/02 RH swollen hock/distal limb, not lying down
12/02/02 LF sore has hardened
RF carpus swollen
20/02/02 RF carpus radiographed – arthritis, osteophytes noted
20/03/02 RF carpus stiff, pads overgrown
27/03/02 LF D2 possible solar abscess
RF flexing better
31/03/02 RF solar abscess undermining
17/04/02 RF D2 cuticle blow out
LF swollen cuticle D?
01/05/02 RF solar abscess blow out
22/05/02 RF(?) copious purulent discharge, radiographed (non-dx)
06/0602* Sand put in
07/06/02 RF D5 toenail 75% detached, fell off following day
09/06/02 General – very stiff
18/06/02 RF swollen – tracking behind toe nails
31/07/02 RF carpus swelling decreased and good ROM, favours LF though
11/09/02 RF D5 soft spot toe nail
LF D3 soft spot
23/10/02 RF holes in pad at D2 and D5, nail blow out D? RF tender
04/12/02 RF D5 blow out, D2 pus under nail
11/12/02 RF D5 base splitting out
31/12/02 RF very sore
08/01/03 RF D5 fistulas and purulent exudate
05/02/03 RF D5 split nail
26/03/03 RF ongoing issues
04/06/03 RF D2 and D5 ongoing issues
23/07/03 RF D2 better, D5 good
17/09/03 RF D5 doing well
15/10/03 RF D5 nail split and foul smell
03/12/03 LF D5 starting to bulge
31/12/03 LF D3 crack increased in size, D5 swollen and hot
07/01/04 LF and RF OK
05/05/04 LF D4 blow out
12/05/04 RF hole in pad 5cm deep (D4?), trim to facilitate drainage
LF cracked toe is still bulging
26/05/04 LF D3 blow out
23/06/04 RF D4 hole deeper
30/06/04 RF carpus swollen
07/07/04 RF slither of welding material FB removed from foot, swelling reduced almost immediately
29/09/04 LH hip sore
24/11/04 LF D4 purulent discharge
08/12/04 LF D4 blow out
10/12/04 RF D? abscess
13/12/04 RF and LF abscesses, D?
22/12/04 LF sore
RF D2 draining
29/12/04 Foot care fore limbs under sedation
02/02/05 RF pad lifting, three connected areas
08/06/05 LF D3 cracked
15/06/05 RF D2 trimmed

ELEPHANT WELFARE ASSESSMENT - EDMONTON VALLEY ZOO

20/07/05 LF D3
RF D5

22/11/05 Ongoing foot problems

07/12/05 LF painful, not bend elbow

12/04/06 Feet OK

07/06/06 RF stiff, shoulder or elbow?

21/07/06 LF purulent material in foot, D?

27/09/06 RF slow healing

14/02/07 LF carpus swollen

27/07/07 RF carpus stiff, no movement

30/07/07 RF carpus 5-10% mobility back

01/08/07 RF D? abscess

05/08/07 RF straight leg gait

29/08/07 RF carpus swelling decreased and better movement, radiographed (non-dx)

30/08/07 RF carpus normal ROM returns

03/10/07 RF sore

08/10/07 Very stiff

15/11/07 RF no flexibility

09/01/07 LF D4 and D5 abscesses

04/10/08 RH sore

28/01/09 LF D3 blow out

10/09/09 LF stiff elbow D4 nail undermined – removed nail front
RF D2 solar abscess

02/03/10 RF carpus worse

18/03/10 RF D4 trimmed out abscess

18/04/10 Physiotherapy mentioned – ongoing programme

19/07/10 LF sore cuticle

21/07/10 LF radiograph D4, NAD

21/12/10 RF D3 lesion grow out, not painful

31/01/11 RF D2 crack in nail
LF D4 crack and healing from previous lesion

08/08/11 LF swollen carpus

20/10/11 LF and RF doing well

10/04/11 LH clicking sound – stifle/tarsus – stringhalt

20/02/12 RF D3 Pad and nail defect

29/01/13 Sore forelimbs

04/02/13 RF D3 pad and nail defect
LF D4 and D5 nail defects

29/08/13 RH lame, ?slipped, fine 24 hours later

24/02/14 Bilateral forelimbs minor nail defects, feet in good condition

23/03/15 RF D2 pad and nail defect

30/06/15 LF whole limb painful

09/09/15 RF swelling between D2/D3 toenails

24/11/15 RF solar lesion

01/12/15 RF 2x solar lesions

18/02/16 Sore limbs

16/03/16 RF abscess under toe (D3?)

END

