

13.12 Guidelines – Health management recommendations for mixed-species aviaries

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1. Purpose

These guidelines are intended to provide general and specific recommendations on how to best manage the health of mixed-species aviaries. The focus is on management of avian species. Inclusion of non-avian species in the exhibit may require further consideration, beyond the scope of this document.

These guidelines should be read in conjunction with the *National Zoo Biosecurity Manual*, which provides general and specific advice about considering and managing biosecurity risks in Australia zoos.

2. Recommendations

2.1 General

- (a) Consider a realistic population target to avoid overstocking. High population density amplifies all additional stressors in mixed aviaries and reduces the effectiveness of intervention strategies for management.
- (b) Plan an effective hygiene schedule to limit disease transmission and avoid faecal contamination of food.
- (c) Train staff to recognise early signs of stress and disease, and to monitor weight, body condition and feather condition during handling for each species. Regular record

keeping and reporting using individual animal identification aids early detection of problems and accurate monitoring.

2.2 Environment

- (a) Consider the perching, flight, shelter, nesting and general space needs of all species, and assess the ability of each species to access such resources when competition with other species occurs. Provision of nest, feed and perch sites in excess of individual needs will allow animals to exert choice.
- (b) Consider how structures accommodating visitors (e.g. furnishings, pathways and viewing platforms) affect the overall usable space for birds. This may vary depending on flight distances of the species in the aviary.
- (c) Plan for sufficient space and resources (accessible food, water, perching, shelter, nesting, and flight space) to accommodate the seasonal changes in territory and behaviour of each species, and peak periods of human visitation.
- (d) Consider where enclosure design can meet species' requirements for optimal ventilation; sunlight and/or UV exposure; warmth, basking areas or supplemental heat; and shade or cooling.
- (e) Design should address the need to capture and/or separate individuals for introductions, animal management or treatment. Options may include internal partitioning or howdy (soft introduction) cage arrangements.
- (f) Capture facilities should not be reliant on feeding stations as sick birds often avoid areas of high activity and may not have normal feeding routines.
- (g) Holding facilities attached to the main aviary should be designed to provide suitable temporary holding/separation for all species within the display aviary.
- (h) Consider if there is sufficient refuge for young or less dominant birds so they can escape aggression from other birds (e.g. during breeding, introductions and peak visitation). The use of foliage and aviary furniture can create visual and physical barriers for hiding and escape.
- (i) When housing ground-dwelling species in aviaries with pools and ponds, consider the ease of draining/filling water bodies and how drainage will affect the surrounding substrate to avoid mould and fungal growth. Consider gradient of depth in the pond, and varying levels of water flow appropriate to the intended species.
- (j) Consider the environment immediately surrounding the aviary which may assist with protection from draughts but avoid impeding appropriate airflow, blocking access to sun/UV light, attracting wild animals or allowing wild animals to interfere with the enclosure.

2.3 Aviary access and maintenance

- (a) Access to aviaries, both for visitors and maintenance, should be via an airlock, to minimise the risk of birds escaping (or entering).
- (b) Consider access to the aviary for renovations and substrate changes. Ensure access doors are sufficient to allow earth removal machinery access. Large aviaries may require skip bin or large-vehicle access.
- (c) Consider substrates and other surfaces that will improve the ease of cleaning/disinfection and drainage. Concrete surfaces are easier to clean and provide superior drainage than packed earth, but this must be balanced against providing

appropriate surface for bird foot health, as hard surfaces can predispose ground birds to poor foot circulation and the development of bumblefoot.

2.4 Species selection

- (a) Consider the potential for aggression between species, particularly during breeding season, and how this might affect available space and resources within the aviary. Consider strategies to reduce territorial disputes, e.g. selecting species with different habitat and nesting requirements, managing appropriate numbers of dominant and docile species, and staggered breeding periods.
- (b) If housing closely related species, consider the risk of hybridisation and the competition for similar resources due to similar feeding, perching and nesting preferences.
- (c) Assess which area of the aviary each species is likely to occupy, including upper, middle and lower canopy, floor, water, refuges and breeding sites, and select species that utilise different areas.
- (d) Consider if resources for one species may create hazards for other species, such as large nesting sites, enrichment tools and glass viewing windows.
- (e) If a pond is present, consider the risks of drowning in species that are easily frightened and/or non-aquatic.

2.5 Nutrition

- (a) Consider species-targeted feeding stations to avoid consumption of inappropriate food items and facilitate the effective use of in-feed medications. Consider methods of excluding larger species such as mesh shields around feeding stations.
- (b) If aviary design does not allow for segregated food delivery, select species based on nutritional requirements to reduce inappropriate consumption of non-target diets.
- (c) Consider how feeding station location will be impacted by proximity to people, nesting sites or other species' food.
- (d) Consider elevating and sheltering all feed stations to avoid faecal contamination of food bowls and spillage of excess food that may promote fungal growth or attract rodents.
- (e) Aim to offer only sufficient food for individuals' needs, to minimise overconsumption or selection of only the most favoured food items (which can lead to obesity and/or malnutrition). Providing only sufficient food will also reduce risk of food spoilage and contamination.

2.6 Health and disease management

- (a) Identify diseases of concern to the species housed (consider local prevalence and presence of vectors), and develop a whole-of-aviary plan to mitigate risk. This may involve environmental management, routine or circumstance-specific biosecurity practices (including general hygiene), scheduled health checks, regular disease screening, preventative treatments, investigation and treatment of disease and appropriate post-mortem investigation of aviary birds, and wild birds and other fauna found dead in the vicinity of the aviary. A suitably experienced veterinarian should be involved in these processes.
- (b) Develop written protocols and an annual preventative medicine calendar for each species. This should include regular screening of faecal samples for endoparasites.

- (c) Rigorous biosecurity and quarantine procedures and post-mortem examination of all deaths are especially important when mixing species of different origins.
- (d) Management of pest species by exclusion (appropriate fine gauge mesh or solid aviary skirting) or removal (trapping or baiting) should be implemented prior to populating the aviary and continue indefinitely. Caution should be exercised if baiting to avoid toxicity of aviary birds. Consideration should be given to management or control of pest or other fauna in the areas surrounding the aviary.

2.7 Response to disease outbreaks

- (a) Consider how treatment/s may be offered to whole aviaries and acknowledge the risks this poses (e.g. risk of drug resistance and inappropriate dosing). Targeted feeding will allow in-feed medication as an alternative to water-soluble treatments, which require frequent stirring and should not be used during hot weather, due to risk of overdosing.
- (b) Isolation of affected aviaries or individuals provides protection for the wider collection. Assign an area and experienced staff to maintain and treat isolated or sick birds.
- (c) Consider providing staff with training in quarantine practices and use of personal protective equipment (PPE) in advance of disease events to ensure familiarity and avoid delays or errors in implementation. Designated staff and equipment and use of PPE such as gumboots and overalls can prevent movement of contaminated materials to unaffected aviaries.
- (d) Early involvement of a suitably experienced veterinarian may assist with establishing relevant quarantine and biosecurity protocols, and identifying or excluding notifiable or zoonotic diseases.
- (e) A thorough post-mortem examination, including all necessary testing or disease investigation, should be conducted on all dead collection animals to reach a diagnosis and determine the cause of death.

2.8 Zoonotic disease risk management

- (a) Identify diseases which pose a zoonotic risk and undertake a risk assessment. Factors to consider include the degree of visitor contact with animals and substrates, pathways for disease transmission and species held in the aviary.
- (b) Consider mitigation strategies, including hygiene practices and use of PPE
- (c) Provide instruction (e.g. signage) and facilities for visitor hygiene procedures such as hand washing or disinfection using running water and soap dispensers or alcohol-based hand rubs.
- (d) Consider developing a communication plan to aid information gathering and dissemination if zoonotic disease is identified.

Approval

These guidelines were approved by the Association Board of the on 21/08/2018.

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