British and Irish Association of Zoos and Aquariums

Veterinary Guidance:
Transfer of Animals

The BIAZA guidelines on minimising the risk of disease transfer between member collections should be followed (*Appendix 5*). However the Balai Directive (Council Directive 92/65 (BALAI)-(amended Council regulation 1282/2002)) will affect the requirements for veterinary screening when moving animals between approved institutions in the EU.

Introduction:

The purpose of these guidelines is to set down general principles of veterinary surveillance to which a collection worthy of being a BIAZA member should aspire.

With this in mind a sending institution has a duty of care to ensure that any animals transferred are, as far as can reasonably be ascertained, healthy and fit for purpose. No animal showing clinical signs of disease should be moved between collections unless the condition in question is chronic in nature and the receiving collection is willing and able to continue to manage the animal in appropriate facilities.

Diseases of concern are likely to change with time such that it is the intention that these guidelines and the Appendix be reviewed annually.

General Principles:

1. Any animal move carries with it a risk of disease transfer.
2. These diseases may be infectious or non-infectious.
3. **Infectious diseases** may cause problems in the individuals being transferred, their conspecifics, other species in the collection or in humans (staff and/or visitors).
4. **Non-infectious diseases** (including behavioural abnormalities) tend to affect only the health and welfare of specimens being transferred but they may also have other knock on effects (e.g. suitability for breeding if the animal is infertile due to testicular abnormality, suitability for enclosure type available if the individual cannot move normally etc).
5. The aim of this document is to provide guidance as to how to minimise the risk of disease transfer between BIAZA collections. For the majority of moves this will be very straightforward.
6. The most important techniques for minimising disease transfer are:
    a. Pre-export health screening
    b. Quarantine and post-import health screening
7. Both of these techniques should be seen as routine for all animal moves, but this document will focus on disease screening (quarantine protocols are covered elsewhere).
8. Effective disease screening generally requires one to know what one is looking for and what the significance of finding it is.

9. Some tests (such as physical examination or haematology/biochemistry will be broad spectrum and can pick up a range of different abnormalities, but most tests are very specific hence the list of diseases of concern needs to be decided first.
10. The diseases of concern may vary from one move to the other as they are dependent on many factors including:
    - The species being transferred.
    - The disease history and adequacy of the veterinary surveillance programme of the sending collection.
    - The disease history of the receiving collection.
    - The purpose of the animal in the receiving collections (e.g. for handling sessions with the public, for breeding, as part of a mixed species exhibit).
    - The current UK/regional disease status
    - The suitability of post import quarantine facilities

The following sections outline:

Section A: BIAZA recommendations for pre-transfer disease screening: minimum standards

Section B: Disease Risk Analysis: guidelines on the risk assessment process

Appendix: Potential Infectious Diseases of Concern for Transfers within the BIAZA Region: arranged taxonomically and including justification as to why these diseases (excluding those which are non-infectious) should be considered and how they might be screened for.

Section A: BIAZA Recommendations

- As a minimum before sending an animal to another institution all members should:
    - Submit a full medical history of the animal to be transferred AT LEAST 1 WEEK PRIOR TO TRANSFER to the receiving collection. In the absence of a medical history, as a minimum a written declaration stating that the animal being transferred appears to be in good health and that there have been no known recent problems with it or its conspecifics should be sent to the receiving collection.
    - Notify the receiving collection AT LEAST 1 WEEK PRIOR TO TRANSFER of any disease concerns in its immediate group / or in the collection as a whole.
    - Where practicable carry out a physical examination of the animal within 7 days of transport (by a vet) and a visual examination by a vet and/or experienced person with the species in question within 24 hours of transport/upon departure.
    - Faecal parasitology and bacteriology (depending on medical history)
- Additional disease screening for certain taxa is recommended (*Appendix 1*).
- Screening requirements should be agreed between the sending and receiving collections.
- Test availability and impact on the animal to be transported must also be considered. A good health history, including details of any new imports to the group and results of post-mortem examinations over a period of years, may prove adequate.
- Liability for screening costs to be agreed between the parties involved.
- Pre-export screening does not replace the need for post-import quarantine. As a rule of thumb mammals, birds and fish should be isolated from the rest of the collection (or co-terminously with

other conspecifics if preferable for social taxa) for a minimum of 30 days; 90 days is recommended for reptiles.

Section B: Disease Risk Analysis

Disease risk analysis should be performed by the receiving institution's vet in partnership with the animal management staff. Though the process may seem involved the first time round, many transfers are very similar in make-up and a pre-export testing schedule for many of a collection's routine imports from their key partners should quickly emerge. These tables need only then be worked through for more unusual ones.

Questions	Considerations
Q1. What groups might be at risk?	• animal being transferred • animals of the same species already in the collection • animals of different species which may come in contact with the imported animal either directly or indirectly • humans (staff and/or visitors)
Q2. What are the infectious disease agents that this species might be harbouring?	• See Appendix for some of the more important diseases of this species. • Also consider diseases of in-contact species that this individual might also be carrying (e.g. mechanical transfer of chytrid fungus between collections)
Q3. What non-infectious health issues might the individuals to be imported be harbouring?	• Examples might include chronic foot problems, teeth problems, poor fertility, metabolic bone disease, drug or food intolerances, heart disease …. • Behavioural health should also be considered (e.g. History of infanticide, abnormal levels of aggression to other animals or staff).
Q4. What is the likelihood that the animal to be transferred is harbouring these diseases / disease agents?	• Consider current diseases of concern in the UK or region. (e.g. TB, avian influenza, tetanus etc). • Closed collections (i.e. ones without any recent imports to the group) are much less likely to be incubating infectious diseases • Measures to decrease the likelihood of disease transfer include pre-export prophylactic treatment (e.g. worming, vaccination).
Q5. What is the potential significance of each of these diseases / disease agents to each of the risk groups?	• See Appendix for guidance. • The significance of some disease issues might be decreased by adjusting the management practices at the receiving collection (e.g. handling chutes to allow training for conscious foot care, avoidance of certain drugs that the animal has reacted badly to). • Be aware that some pathogens might not cause disease in your collection but, if they are detected, they might lead to restrictions on animal moves (e.g. presence of low pathogenic strains of avian influenza may shut down the zoo)
Q6. Can the diseases / disease agent that are both significant and likely, be screened for before export?	• Not all diseases can be screened for: The diagnostic test may not have been developed, may not be routinely available, may not be accurate, may require samples that are difficult or dangerous to obtain or may be prohibitively expensive. • The Appendix provides guidance as to whether a diagnostic test

	is available and what samples might be required.
Q7. If they can't be effectively screened for, are there any other measures that could be taken to reduce the risk?	• For those diseases where no diagnostic tests are practicable a combination of medical history (including PM's) and post import isolation may be the best protection. • Prophylactic treatment may be useful in some instances (see Q4)

APPENDIX 1: Potential Infectious Diseases of Concern for Transfers within the BIAZA (British & Irish) Region

MAMMALS

ALL ANIMALS SHOULD HAVE:

- Medical history sent a minimum one week prior to export
- Declaration of presence or absence of declaration diseases
- Prophylactic treatments as recommended
- A physical examination – including notification of findings to receiving collection

IT IS HIGHLY RECOMMENDED THAT ALL ANIMALS SHOULD HAVE:

- Tests for the diseases of concern indicated

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
Primates	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Tuberculosis (bovis or tuberculosis) in previous 5 YEARS • Suspicious reactors to TB skin test in previous 12 months. • Animals testing positive for Herpes B (macaques) • Animals testing positive for Hepatitis B							
	Enteric nematodes (highlighting Strongyloides, pinworm)	Zoonoses. Known to cause morbidity in NHP's	M	M	N Treat	Faecal parasitology -3 day pooled sample. Strongyloides may require charcoal culture for ID	Faeces	3 day pooled sample (plus history of this being done). cancan be difficult to pick up (intermittent shedding) so treatment should be considered prior to a move even if test negative
	Enteric protozoa (highlighting E.histolytica, B.coli, B.hominis, D.fragilis)	Most zoonoses. Confirmed clinical disease and carrier states in majority of NHP. Severe under reporting of protozoal infections in UK	M	H	N	Fresh stained faecal smear. Fresh-frozen faeces for E.histolytica	Faeces	Sample twice, 1 week apart.. Samples must be very fresh.. If no in house ability, can put faeces in formalin for lab analysis of any cysts.

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
		zoos suspected						
	Enteric bacteria (Highlighting Shigella (apes), Salmonella, Campylobacter)	Zoonoses – known to cause morbidity and occasionally mortality in NHP's	M/H	M	Y potentially	Bacteriology	Faeces	Salmonella should be typed and Campylobacter speciated, especially in subclinical carriers
	Tuberculosis caused by M. bovis or tuberculosis	Important cause of mortality/morbidity and ZOONOSIS	H	L	Y	Y – skin test, also gamma interferon blood test for some species Culture gold standard but slow and insensitive	First line standard: Skin test May also consider: Tracheal/ bronchial wash for culture Serum/ plasma (Investigating TB antibody Stat-Paks from Chembio)	Highly recommended though might be acceptable to forgo if closed group with regular negative testing. NEED TO DISCUSS REGIME WITH RECEIVING COLLECTION Remember to consider TB status of in contact humans. If animals are in a walkthrough exhibit or there is any chance their carers may have been infected, testing is highly recommended.
	Hepatitis B	potential zoonosis	L	M	N but vacc. keepers	Y - Virus Isolation/ PCR/ ELISA etc	Blood (Serum)	Gibbons common carriers. See TAG for notes on management.
	Herpes Viruses eg: simplex (apes) ateles (spider and owl monkeys) B (macaques)	Herpes B potential Zoonosis. Other herpes viruses can cause fatal disease in aberrant primate species)	H/L (sp. Dependant)	M	Herpes B Y Others N but sp dep.	Y - Virus Isolation/ PCR/ ELISA etc	Blood (Serum)	HPA reference laboratory for Herpes B. – can also screen for presence of other alpha herpes viruses but may not be able to identify to species level.
Ruminants and camelids	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Tuberculosis/Mycobacteriosis. (in previous 3yrs) • Paratuberculosis (Johnes Disease - in previous 2yrs) • Transmissable spongiform encephalopathies (in previous 10yrs). • Lumpy Jaw • Foot rot							

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	• Bluetongue • Domestic Cattle on premises: History of BVD/MD, IBR, Leptospirosis. • Trichuris (especially for camels)							
	Endoparasites. Helminths, protozoa etc	Important cause of disease/morbidity	M/H	H	N TREAT	Faecal examinination. Pooled faeces from group is probably acceptable although individual samples better	faeces	Faeces collected over several days better than an individual sample
	Salmonellosis/ Campylobacter	Important cause of disease/morbidity and ZOONOSIS	M	M	N	Faecal cultures. Pooled faeces from group is probably acceptable	faeces	Faeces collected over several days better than an individual sample
	Tuberculosis	Important cause of disease/morbidity and ZOONOSIS.	H	L	Y	Intradermal skin test Possible gamma interferon blood test available		Test could be omitted on basis of collection history and local disease status. To be discussed between vets for both collections
	Mycobacterium paratuberculosis (Jones Disease)	Important cause of disease/morbidity and ZOONOSIS.	H	L	Y	ELISA and AGID available for cattle. CFT and AGIDT available for sheep and goats. Faecal exam unreliable	Blood	Appropriate test for species to be discussed between vets and VLA. Vaccination may affect tests. Faecal culture is gold standard to eliminate atypical mycobacterial infection
	Malignant Catarrhal fever	Important cause of disease in deer, antelope and cattle. Sheep can be symptomless carriers	H	M	Y	IFAT and SNT available.	Blood	sheep, wildebeest and other alcelaphine antelope should be screened if planning mixing or accommodating near sensitive

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
								species such as Pere David Deer
	MV/CAE	Important cause of disease in sheep and goats.	H	M	Y	ELISA	Blood	Sheep and goats only
Pigs Peccaries and hippos	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Tuberculosis/mycobacteriosis (previous 3yrs) • Domestic pigs on premises: PRRS, Atrophic Rhinitis, Parvovirus, Mycoplasma hyopneumoniae, PMWS/PDNS, TGE, Strep suis meningitis..							
	Endoparasites. Helminths, protozoa etc	Important cause of disease/morbidity	M-H	H	N TREAT	Faecal examination. Pooled faeces from group is probably acceptable although individual samples better	faeces	Faeces collected over several days better than an individual sample
	Salmonellosis/Campylobacter	Important cause of disease/morbidity and ZOONOSIS	M	M	N	Faecal cultures. Pooled faeces from group is probably acceptable	faeces	Faeces collected over several days better than an individual sample
	Tuberculosis	Important cause of disease/morbidity and ZOONOSIS in Hippos Questionable justification in pigs and peccaries at this time	H	L	Y	Intradermal skin test not reliable/validate. Possible blood test available	Blood	Testing should be discussed with receiving collections and with TAG. May be recommended in Hippos depending on history of population / individual.
Equidae	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Contact with domestic horses: influenza, strangles, CEM • EHV, EIA and sarcoid • Must have a Horse Passport (mandatory from July 09)							
	Enteric parasites. Strongyles in	Common, can be important cause of morbidity	M	H	N TREAT	Various methods of quantitative and	Quantitative egg count on 3 consecutive day	Faeces collected over several days better than an individual sample

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	particular and strongyloides, parascaris, oxyuris, spirurids, tapeworms and cyathastomes					qualitative faecal tests and hatching of eggs into larvae with subsequent identification	faecal sample. Need 3-5g faeces	Where risk of occult cyathostome infections, special treatment regimes are needed
	Salmonella spp.	Zoonotic disease	M	L	N	Culture (+/- serotyping also PCR)	Faecal sample on 3-5 consecutive days. Need 3-5g faeces.	Faeces collected over several days better than an individual sample
Tapir and Rhino	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Rhino: skin disease • Tuberculosis							
	enteric parasites	common in white rhino with little clinical disease	M-L	M-H	N	Faecal examination.	faeces	Pooled faeces from group is probably acceptable although individual samples better
	Tuberculosis	Important cause of disease/morbidity and ZOONOSIS	H	L	Y	Refer to TAG recommendations		TB infection is a reported problem in Tapirs. Definitely worth considering.
	faecal bacteriology		M	L	N	Faecal cultures.	faeces	Faeces collected over several days better than an individual sample Pooled faeces from group is probably acceptable
Elephants	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • EEHV • Tuberculosis / mycobacteriosis (previous 3yrs) • Elephant pox							
	Endo-parasites	Cause of morbidity	L	M-L	N Treat	Faecal parasitology	Faeces (3 samples over 3 weeks)	

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	Salmonella	Cause of mortality/morbidity and ZOONOSIS	M	L	N	Faecal culture	Faeces (3-5 consecutive days worth of samples cultured separately)	Carrier animals may only shed intermittently Faeces collected over several days better than an individual sample
	TB (M.tuberculosis or M. bovis)	Important cause of mortality/morbidity and ZOONOSIS Treatment options very limited	H	L	Y	Trunk washes for culture still definitive test despite 8 week wait and lack of sensitivity Rapid Test (RT) and confirmatory Multiprint Immunoassay (MAPIA) technology appear to show upto 100% sensitivity and much earlier diagnosis	Multiple trunk wash samples (at least 3 within 7 days) Whole blood, serum or plasma	Intra-dermal skin test demonstrates very poor sensitivity RT and MAPAI will replace culture once validity further demonstrated Refer to elephant TAG for current testing recommendations
	EEHV (Elephant Endotheliotropic Herpesvirus)	Many viruses circulating. No disease in most individuals BUT can be Important cause of mortality/morbidity with peracute course in naïve individuals no vaccines or well proven therapy	H-L	H?	??N	Serology possible in Europe or USA but needs co-ordination by someone! PCR on blood of clinical cases or PM tissues of other herd members	Plasma (preferred) or serum (can be frozen and sent as batches)	Current thinking suggests that all elephants are infected with one or more strains. Introduction of a new strain may cause peracute disease in naïve individuals. Refer to Elephant TAG recommendations (currently under review)
Rodents, insectivores and lagomorphs and	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Sendai virus • Sialodacryoadenitis							

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
sloths	• EMCV (encephalomyocarditis virus) • LCMV • Yersiniosis • Capillaria hepatica **Recommended pre-export prophylactic treatments:** • Vaccination of Lagomorphs against myxomatosis and viral haemorrhagic disease							
	Enteric parasites (and fascioliasis in beavers)	Common,	M	H	N Treat	faecal smears , McMasters, identification of cysts or trophozoites in smears, serology for giardia	3 consecutive days faecal sample	Faeces collected over several days better than an individual sample Pooled faeces from group is probably acceptable although individual samples better
	Enteric bacteria (eg salmonella)	causes disease AND zoonotic	M	M	N	Y	Faeces / cloacal swab	Highly recommended
	Encephalitozoon cuniculi (lagomorphs)	Endemic in captive population of lagomorphs; infection of rodents possible	M	H	Y treat	serology	blood	Testing to determine positive or negative status in lagomorphs recommended; treatment available
	Sarcoptic mange, lice and other ectoparasites	Can be debilitating leading to morbidity and mortality and contagious	M	M	Y treat	microscopy /hair samples	Skin scraping / hair pluck/ tape strip / physical exam	All animals with significant ectoparasite burdens should be checked for other underlying disease
	Mycoplasma (rats)	important cause of respiratory disease	M	M	N	Y	nasal swab	
	Lymphocytic choriomeningitis LCMV (small rodents)	Zoonoses, can be spread to callitrichids and easily transferred from wild rodents to captive rodents	H	M	?Y depends on status of collection	serology	Blood/serum from individual or from small proportion of the group.	
Chiroptera								

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	In-hand health-check to confirm ID and check general health including teeth, patagial integrity, limbs and external genitalia. Radiography to be performed if legs or wings give concern. **Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Lyssavirus (in previous 3yrs) – include screening history ie number of samples submitted over the previous 3yr period – this is particularly important for any walk through exhibits.							
	Intestinal parasites	Important cause of morbidity and mortality	L	L	N treat	Routine faecal flotation	Faeces	Three samples at weekly intervals from known individuals if small group or pooled sample from large group
	External parasites	Important cause of morbidity	L	L	N treat	Visual check/sticky tape and/or skin scrape	Skin/hair or skin debris	Single sample from unaffected animals at health check
	Faecal bacteria	Important cause of morbidity and mortality	L	L	N but depends if walk through…	Microbiology	Faeces	Three samples at weekly intervals from known individuals if small group or pooled sample from large group – ensure screened for zoonoses including *Salmonella* and *Campylobacter*
	Lyssavirus	Important cause of mortality/morbidity and zoonosis	H	L	Y	FAVN test /	Serum / also submit heads of any bat that dies to VLA for screening	Test performed at VLA Weybridge. Would recommend test on all if a small group or if destined for a walk-through exhibit, otherwise a representative sample
Marsupials	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Lumpy Jaw							
	Enteric parasites	Coccidiosis common in joeys. Monitor for nematodes	M	M	N TREAT	Faecal parasitology	Faeces	3 day pooled sample
	Salmonella and campylobacter	Zoonosis and can cause severe morbidity	M	M	N	Bacteriology	Faeces	Type Salmonella whenever possible

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	Lumpy Jaw (Bacteroides/ Fusobacterium)	Common cause of morbidity	M	M	N	Clinical signs? Bacteriology	Lesion swab	Test only when suspect case
	Chlamydia	Common in Koalas. Zoonosis.	L	L	N	'Clearview' rapid test	Blood	Koalas only
Felidaea	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Any of the diseases listed below **Recommended pre-export prophylactic treatments:** • Vaccinations for FELV, FIV,+ other feline viruses up to date (full vaccination history and opportunistic testing may negate need for testing prior to export – discuss with receiving collection). NOTE Beware use of modified live vaccines in non-domestic felids.							
	enteric parasites		M-L	M-H	N	Faecal examination.	faeces	Pooled faeces from group is probably acceptable although individual samples better
	faecal bacteriology		M	L	N	Faecal cultures.	faeces	Faeces collected over several days better than an individual sample Pooled faeces from group is probably acceptable
	Feline Immunodeficiency Virus (FIV)	Potential cause of serious immunodeficiency-like disease	H/M	L (except lions)	Y	Antibody testing by ELISA & Western Blotting	Serum	Possibly prolonged seroconversion times in non-domestic species.
	Feline Leukaemia Virus (FeLV)	Potential cause of neoplastic & degenerative conditions	M	L	Y	Antigen test	Serum	Domestic cat vaccines not validated in non-domestic species
	Feline Coronavirus	Potential cause of fatal Feline Infectious Peritonitis	M	L	N	Antibody test. (PCR for virus shedding currently unavailable in the UK)	Serum	Interpretation of antibody titres complicated. Seek veterinary advice if positive

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	Chlamydophila felis	Cause of ocular & respiratory disease, and possibly involved in infertility	M	M	N	PCR	Conjunctival swab	Vaccination probably effective
	Feline Herpes Virus (FHV)	Cause of severe respiratory disease, ulcerative keratitis & dermatitis	H (if not vac)	M	Y	PCR & virus isolation	Oropharyngeal swab in VTM	Carrier status recognised. Vaccination effective
	Feline Calicivirus (FCV)	Cause of severe oral & respiratory disease (and lamness)	M	M	Y	PCR & virus isolation	Oropharyngeal swab in VTM	Carrier status recognised. Vaccination variably effective due to rapid virus evolution.
Canidae	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Distempter, parvovirus, adenovirus, leptospirosis, sarcoptic mange **Recommended pre-export prophylactic treatments:** • Vaccinations up to date for canine distemper, parvovirus, adenovirus 1 and leptospirosis							
	Endoparasites Nematodes Cestodes Coccidia (Neospora caninum)	Common, some zoonotic	M	H	N	Faecal flotation, including Baermann technique for lungworm	Faeces	Test pre-move and treat with appropriate anthelmintics/anticoccidials pre-move. If positive inform receiving zoo, which should also test on arrival and re-treat during quarantine period
	Ectoparasites Fleas	Can cause morbidity. Can be involved in transfer of infectious agents e.g ticks	L	M	N	Visual examination Skin scrape	skin scrape. Visual exam	Treatment indicated with appropriate ectoparasiticide if ectoparsites detected on pre-move physical examination. Any animals

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	Mites/Lice/Ticks	and *Borrelia*						with skin lesions should be investigated pre-move
	Salmonella	Common, can cause morbidity. Zoonosis	M	M	Variable	Culture	Faeces	Test pre-move, only if animal has abnormal faeces. If positive, discuss significance with receiving zoo's vet. NB Healthy animals with normal faeces highly unlikely to be positive. Treatment with antibiotics generally only indicated if risk of contact with immunosuppressed people/animals or children, and may induce latent carrier status
Mustelids/ viveridae/ procyonidae	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • distemper **Recommended pre-export prophylactic treatments:** • Consider use vaccines against canine disease but beware use of modified live vaccines as may cause disease in these species.							
	enteric parasites		M-L	M-H	N	Faecal examination.	faeces	Pooled faeces from group is probably acceptable although individual samples better
	faecal bacteriology		M	L	N	Faecal cultures.	faeces	Faeces collected over several days better than an individual sample Pooled faeces from group is probably acceptable
Marine mammals	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Tuberculosis • Morbillivirus • Herpes virus in seals • Small pox							

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELY-HOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	• Brucellosis							
	enteric parasites incl. lungworm		M-L	M-H	N	Faecal examination.	faeces	Pooled faeces from group is probably acceptable although individual samples better
	faecal bacteriology		M	L	N	Faecal cultures.	faeces	Faeces collected over several days better than an individual sample Pooled faeces from group is probably acceptable
	morbillivirus		H	L	Y	Serological and/or PCR	blood	
	herpes (seals)		H	M	Y? possible	Serological and/or PCR	blood	Data deficient in most but does affect commmon seals seriously
	Brucella		Zoonotic hazard	M	N?	Serology at VLA	blood	
	Tuberculosis		H	Species related	Y	Skin though not reliable. New rapid tests		Particularly some sealions and South American fur seals

BIRDS

ALL ANIMALS SHOULD HAVE:

- Medical history sent a minimum one week prior to export
- Declaration of presence or absence of declaration diseases
- Prophylactic treatments as recommended
- A physical examination – including notification of findings to receiving collection

IT IS HIGHLY RECOMMENDED THAT ALL ANIMALS SHOULD HAVE:

- Tests for the diseases of concern indicated

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
Passerines	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Chlamydophilosis • Atoxoplasmosis							
	Enteric nematodes	Big cause of morbidity and occasionally mortality	M	H	N TREAT	Parasitology	Faeces	3 day pooled faecal sample
	Atoxoplasma	Known infection in the UK. Several species – causes high mortality – fledglings usually, but Bali mynah particularly sensitive	H	M/H	Possibly Y (dependant on sp.)	Faecal parasitology for oocyst detection (multiples required)	Faeces +/- blood buffy coat	Will be species dependant. At least 3 negative faecal samples required at one week intervals if using parasitology alone.
	Salmonella and Campylobacter	Zoonosis	M	?M	N	Bacteriology	Faeces	Salmonella positives should be typed
	Chlamydophila	Zoonosis. Found in UK collections.. Can cause debilitation.	M	M/L	Y TREAT	PCR	Heperanised blood, Faeces or cloacal swab	Only if history at collection within the previous 12 months. Single sample required.
	Avian Polyoma virus (Gouldian finches)	Species specific?	H	M	?Y	PCR	Feather, heperanised blood, faeces, cloacal swab	Single sample required
Falconiformes	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)**							

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	• Avipox: Spread by flies. Declare if cases in previous 12mths, suggestive clinical signs or if the bird has been imported or has been housed with/near birds imported from Middle East.. DX by EM/histopath of lesions. Serology also possible. • Chlamydophilosis **Recommended pre-export prophylactic treatments:** • Aspergillosis: Important cause of morbidity in stressed raptors especially gyrs (and their crosses), goshawks, Snowy Owls and mountain eagles (eg Golden Eagles) Use of itraconazole at 10mg/kg sid po recommended in all susceptible species for 7-10 prior to move until 2 weeks post-moveNote:, if the administration of drug will cause more stress or if the bird is paired with another (thus making administration unreliable) then it may be wise to ignore this							
	Endoparasites nematodes -coccidia	Coccidia esp in falcons, esp merlins and their hybrids	M	H	N Treat	Faecal floatation	Faeces	Would recommend at least one sample pre- and post- move – the latter being 7-14 days after move during quarantine period Faecal samples should be pooled 3-day samples for coccidia
	Chlamydophilosis	Many wild raptors appear to be seropositive Therefore worth considering in passage birds or in those that have had exposure to wild birds – eg used for hunting	M	L/M	Y Treat	Serology to assess exposure Faecal PCR to assess shedding	Blood / Faeces	Serological test – if positive then perform PCR
Waterfowl	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Avian TB • Yersiniosis • Chlamydophilosis							
	Enteric Parasites	major cause of debility	M/H	H	Treat	Y	Faeces	Highly recommended
	Enteric bacteria (eg salmonella)	causes disease AND zoonotic	L	H	N	Y	Faeces / cloacal swab	Highly recommended

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
Psittacines	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Chlamydophilosis • PBFD • Polyoma • Psittacine Herpes Virus (Pacheco's Disease) • Proventricular Dilitation Disease							
	Enteric nematodes	Big cause of morbidity and occasionally mortality	M	H	TREAT	Parasitology	Faeces	3 day pooled faecal sample
	Salmonella and Campylobacter	Zoonosis	M	?M	N	Bacteriology	Faeces	Salmonella positives should be typed
	Chlamydophila	Zoonosis. Can cause debilitation.	M	M/L	Y TREAT	PCR	Heperanised blood, Faeces or cloacal swab	Highly recommended.
	Psittacine Beak and Feather Disease (PBFD)		H	M	Y	PCR	Heperanised blood, Feather pulp	Highly recommended.
	Polyoma Virus		H	M	Y if receiving collection is free	PCR	Heperanised blood, Faeces or cloacal swab	Highly recommended. Lovebirds can be latent carriers.
	Psitticine Herpes Virus		H	M	Y	Serology (VLA) but not very sensitive. Autopsy only reliable test	Blood	Species specific
Columbiformes	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Chlamydophila.							
	Enteric nematodes	Big cause of morbidity and occasionally mortality	M	H	N TREAT	Parasitology	Faeces	3 day pooled faecal sample
	Thrichomonas/	Known morbidity in the UK	M	M	N	Crop swab –	Crop swab	Only if suspect on clinical examination

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	Candida				Treat	examine warm on microscopy		
	Salmonella and Campylobacter	Zoonosis	M	?M	N	Bacteriology	Faeces	Salmonella positives should be typed
	Chlamydophila	Zoonosis. Found in UK collections.. Can cause debilitation.	M	M/L	Y TREAT	PCR (BioBest)	Heperanised blood, Faeces or cloacal swab	Only if history at collection within the previous 12 months. Single sample required.
Penguins	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Plasmodium • (Pododermatitis) **Recommended pre-export prophylactic treatments:** • Aspergillosis: Important cause of morbidity in stressed penguins. Use of itraconazole at 10mg/kg sid po recommended in all susceptible species for 7-10 prior to move until 2 weeks post-move							
Other Birds	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Avian TB • Chlamydophillia • Yersiniosis							
	Enteric Parasites	major cause of debility	M	H	TREAT	Y	Faeces	Highly recommended
	Enteric bacteria (eg salmonella)	causes disease AND zoonotic	M	M	N	Y	Faeces / cloacal swab	Highly recommended
	Psittacosis (Chlamydophila psitaccae)	Can cause mortality and infertility. common in some wild bird species. Zoonotic. Balai approval will be revoked if positive	M	M/L	Y (TREAT)	y	Blood, faeces	Highly recommended

LOWER VERTEBRATES AND INVERTEBRATES

ALL ANIMALS SHOULD HAVE:

- Medical history sent a minimum one week prior to export
- Declaration of presence or absence of declaration diseases
- Prophylactic treatments as recommended
- A physical examination – including notification of findings to receiving collection

IT IS HIGHLY RECOMMENDED THAT ALL ANIMALS SHOULD HAVE:

- Tests for the diseases of concern indicated

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
Lizards	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Mortality rate and main causes death in previous year. • OPMV • Cryptosporidiosis							
	Endoparasites	Can be cause of debility	M	M	N Treat	Fresh faecal examination + floatation	Fresh faeces	3 tests one week apart.
	Paramyxovirus	Has been known to cause death in Rhinoceros iguanas	?M	L	?Y	Blood serology	Serum	Min test twice at 2 month intervals. Test currently available in UK can be difficult to interpret. Declare history and OPMV status of collection. Particularly important if receiving collection is negative see under snakes.
	Cryptosporidiosis	Can be cause of debility Can be a problem for zoos which intend public contact	M	M	Y	Fresh faecal examination	Faeces, If history in collection ? do stomach wash	Declare history of collection.

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
Snakes	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Mortality rate in previous year • OPMV • IBD • Cryptosporidiosis • Amebiasis							
	Endoparasites	Can be cause of debility	M	M	N Treat	Fresh faecal examination + floatation	Fresh faeces	3 tests one week apart.
	Paramyxovirus	Has been known to cause peracute mortality in snakes.	?H	?M	Y (dependant on status of receiving collection)	Blood serology (only bird PMV tests available in this country – some cross reactivity but significance unclear). PCR developed but not currently commercially available.	Serum (potentially tracheal and cloacal swabs for PCR)	Min test twice at 2 month intervals Declare history and OPMV status of collection. Particularly important if receiving collection is negative. NB interpretation of PMV1 -7 serology results can be difficult in the absence of history of clinical disease.
	Cryptosporidiosis	Can be cause of debility Can be a problem for zoos which intend public contact	M	L	Y	Fresh faecal examination	Faeces, If history in collection ? do stomach wash	Declare history of collection.
	Boid inclusion body disease	Causes morbidity and mortality	H	?M	Y	Biopsies/Histology	Kidney/tonsil/lung/liver	Declare history of collection. In particular nos of snakes died in last 3 years and nos of these that had pm and histology.
Chelonia	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Upper respiratory tract diseases (URTD)							

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	Other: • Note: Salmonella is not considered to be a disease of concern as all Chelonia should be considered to be carriers and appropriate hygiene measures should be taken. Cryptosporidia are also not included for the same reason.							
	Enteric parasites	Potential cause of debility	M	H	N	Faecal parasitology	faeces	3 faecal tests one week apart. Including fresh examination for motile protozoa and Ziel Nielsen fro Cryptosporidium. Note many motile protozoa are normal commensals and required for proper gut function.
	Mycoplasma	Important cause of mortality/morbidity	H	M	Y/N dependant on status of receiving collection	PCR	Nasal wash, choanal swab	Declare history of upper respiratory tract disease In collection
	Chelonian herpesvirus	Important cause of mortality/morbidity	H-L dependant on species	M	Y/N dependant on status of receiving institution	PCR	Nasal wash, coanal swab	Declare history of upper respiratory tract disease I collection. Current test unable to differentiate between potentially pathogenic and commensal herpes viruses. Interpret results with caution.
Amphibia	**Declaration diseases: (must declare if the following found in this taxonomic group of species in previous 12mths)** • Chytridiomycosis (previous 2yrs) NB NOW A NOTIFIABLE DISEASE • Rana virus (previous 2yrs) NB NOW A NOTIFIABLE DISEASE							
	Endoparasites	Can be cause of debility	M-H	H	N Treat	Fresh faecal examination + floatation	Fresh faeces	3 tests one week apart.

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	Chytridiomycosis	Major cause of death. Major risk for local amphibian fauna.	H	M	Y	Real Time PCR	Skin swab. Skin from post mortem cases, frozen or fixed in 70% ethanol.	Declare history of collection. And mass mortalities for last two years. Indispensable. Treatment + negative testing prior shipment required if positive.
	Ranavirus	Major cause of death.	H	M	Y	PCR	Tissue samples from post-mortem cases	Declare history of collection. No possibility of testing prior to moving the specimens but should be advised to test pm cases? Clear collection history should be obtained prior to transport?
Fish	• Prior to moving, I would ensure that a history of the tank/system/species is sent with a particular reference to parasites and infectious diseases. It would be useful to know if any histology has been done and if so how many post mortems/gills presses/skin scrapes and histology have been done cf the number of mortalities from the system/species/tank. • All fish should enter quarantine and the rare exceptions to this mean that pre movement testing is probably less useful than good history.							
Aquatic inverts (AR +ST)	No requirement for testing pre-move. • Tank and tank occupant history needed. • Histories of treatments e.g. levamisole for nudibranchs on corals but also e.g. *Cryptocaryon irritans* in fish in shared water. • Quarantine needed by recipients. • Awareness of disease in local area e.g. crayfish plague in signal crayfish and potentially UK white-clawed.							
Terrestrial inverts	In terms of disease control, few infectious diseases are well-described and most apparent outbreaks are simply reflecting husbandry stress Therefore, while quarantine is essential the length of time also cannot be known - needs muse tailor the length of quarantine to individual disease and to the species' lifespan. • If the supplying collection has had previous problems with a potentially infectious agent this should be checked during the quarantine period - where numbers allow this shoudl be done by culling and post-mortem. Also if numbers allow it may be worth culling a few anyway and preserving in alcohol for future investigation should need arise Sick animals should (where numbers allow) be culled for investigation. Dead animals should be stored - there is often little use in performing PM's on these. However, they may be of use for whole body virology, etc should an "outbreak" then start							

Taxonomic group of species	Disease of Concern	Justification	HAZARD (H/M/L)	LIKELYHOOD (H/M/L)	SHOW STOPPER? (Y/N)	Screening Test available	Type of sample required	Notes (eg sampling regime, vaccine available / recommended?)
	• If faeces can be identified endoparasite checks (esp spiders) may be done pre- / post-move • Handling animals - screening for salmonella screening not recommended as it would be unclear what either a positive or negative culture would mean. (Most zoonoses are generally contracted by eating the invertebrate!)							