Table A2. Summary of appropriate study design, camera spacing, and survey effort (adapted from Wearn & Glover-Kapfer [2017] with additional references included) for various modelling approaches. Note – these are guidelines only, using best available information. There is uncertainty associated with each of the different approaches. To address this, the table contains 'minimum', 'ideal' and 'often' used values, as well as qualifiers.

Approach	Camera arrangement	Camera spacing	Number of cameras	Camera days per camera location	Total number of camera days	Survey duration	References
Species inventory	Targeted[1,2] Random if species poorly known[3]	No minimum[2,4] Ideally 1-2 km[2,4,5]	No minimum[4] Ideally ≥ 20[1,3]	No minimum[i] Ideally ≥ 30; < 30 for highly detectable[4]	No minimum[1,3,4]	No maximum[1,4]	[1] Tobler et al., 2008 [2] Rovero et al., 2013 [3] Wearn et al., 2013 [4] Wearn & Glover-Kapfer, 2017 [5] Colyn et al., 2017 [6] O'Brien, 2010 [7] O'Connell & Bailey, 2011 [8] Cusack et al., 2015 [9] Ahumada et al., 2011 [10] Kinnaird & O'Brien, 2011 [11] Wearn et al., 2016 [12] Li et al., 2012 [13] Kays et al., 2020
Species diversity & richness	Ideally, random[2,4] Stratified, or Stratified random[4] Clustered[6,7]	Ideally ≥ 1 km, but closer may be justified[1,8] 1-2 km is often adequate (provided each camera is treated as an independent sample)[1,4,9,10]	Minimum 20; Ideally >=50; If stratified by habitat, 20-50 per stratum[4] 20-100 to reach species-accumulation asymptote[9,11,12] Commonly 30[9] 25-35, scale-dependent[13]	Ideally ≥ 30[4,9]	Generally, 600-1500; ≥ 1000[4]	Ideally < 6 months; 3-6 months for medium-large mammals[4]	
Occupancy models[14]	Ideally, random[7] Random or targeted[6,15-17] Clustered[7,18] Stratified random[4]	Ideally, larger than home range (minimum) or > 1 km if home range size unknown[4] ≥ 1 km is typical[4]	Minimum 40[4] Ideally ≥ 100[15-17] >60; species-dependent[2] <20 for common (occur at >75% of sites)[13]; ≤30 if occupancy > 0.8[17] >150 for rare (occur at <25% of sites)[13] 30-60 sites for less common[17]	≥ 30 for most[15-17] 80-100 if detection probability is low[17]	Species-dependent; >1200 for most[4] > 1,000 for most[6,15-17] > 5,000 for rare / hard to detect[17]	Species-dependent[16] Ideally < 6 months[6,15-17]	

Approach	Camera arrangement	Camera spacing	Number of cameras	Camera days per camera location	Total number of camera days	Survey duration	References
Relative abundance indices (RAI)	Ideally, random[4] Systematic random[4]	No minimum[4] Ideally, ≥ 1 km[3] 1-2 km[4]	As many as possible; Minimum of 20; Ideally ≥ 50[4,19] If stratified by covariates, 20-50 per covariate[4]	No minimum; Ideally ≥ 30; As many as possible[4]	Ideally > 2000[4] Enough to capture > 10 detections; Ideally >20 detections; Usually > 2,000 total for many carnivores / rare ungulates[4,19] >250 for common[4,19,20] 20,000 "hyper-rare" (caught 0.1% of the time)[4,6]	No maximum; Ideally < 12 months[3]	[14] MacKenzie et al., 2002 [15] Mackenzie & Royle, 2005 [16] Guillera-Arroita et al., 2010 [17] Shannon et al., 2014 [18] Pacifici et al., 2015 [19] Rowcliffe et al., 2008 [20] Rovero & Marshall, 2009 [21] Karanth & Nichols, 1998 [22] Karanth, 1995 [23] Sollmann et al., 2012 [24] Clarke et al., 2023 [25] Tobler & Powell, 2013 [26] Krebs et al., 2011 [27] Borchers & Efford, 2008 [28] Royle & Young, 2008 [29] Royle et al., 2009
Capture-recapture (CR) / Capture-mark-recapture (CMR)[21,22]	Ideally, paired[ii,1,2,4] or random[4] Targeted[iii,1,4,23] Targeted for carnivores[2] Systematic[24]	Spatially-dependent[iv,4] Species-dependent[v,2] (< home range size); >4 per home range[4] 2-4 per smallest home range[2] 1-4 km is typical[1,4,23]	At least 1 per smallest home range[2,21] At least enough to capture 10-30 individuals[2] At least enough to capture the home range of 5-10 individuals[4,25-26, 31]	≥ 30 for all but the most detectable; >60 for reasonable precision for most; >60-120 if capture probability is low[4,25]	> 1,000 for most species; >1200 common; > 3,500 if the detection probability is low[4]	As short as possible[4] >60 recaptures[2] Species-dependent; Ideally < 3 months[1,23]	
Spatially explicit capture-recapture (SECR) / Spatial capture-recapture (SCR)[26-29]	Paired[2,4] Clustered[4,30] Systematic[24]	Species-dependent (< home range size); Ideally, 1/3 the home range radius[4,23,30] (~4-7 camera per home range)[4] Maximum of 0.8 times the home range radius[4,23,30]	Enough to capture of >20 individuals[4,32] and ideally 20-50 total recaptures[4,31,33] **Recommendation:** Enough to recapture 10-30 individuals[4,34] **Recommendation:** If used suggested 4 camera per home range, 40-120 locations[4] 60-100 if detection probability is < 0.1[25]	≥ 30 for all but the most detectable; >60 for reasonable precision for most; >60-120 if capture probability is low[4,25]	Enough for 20-50 recaptures total[4,31,33]	Minimum of 30 days per survey (presuming multiple surveys will be completed; ideally > 12 months total; based on minimum requirements for running SCR models)[35,36]; Ideally 60-90 days (depending on time required to maximize detections while	

Approach	Camera arrangement	Camera spacing	Number of cameras	Camera days per camera location	Total number of camera days	Survey duration	References
Spatial mark-resight (SMR) (type of SCR model)[23,30,37]	Random with respect to activity centres[38] Systematic random or clustered[24]	1-3 sigma (related to home range size)[30]	Minimum of 30; 60 (but will depend on detection probability and resight data)[36,39]	Minimum 30 (precision is dependent on number of marked individuals in a population)[36,39]	360 days[36,39]	minimizing the violation of the "closed population" assumption)[35,36]	[30] Sun et al., 2014 [31] Noss et al., 2012 [32] Foster & Harmsen, 2011 [33] Efford, 2004 [34] Karanth et al., 2011 [35] Burgar et al., 2018 [36] Burgar, personal communication, April 23, 2023 [37] Chandler & Royle, 2013 [38] Sollmann et al., 2013b [39] Burgar, 2021 [40] Clark, 2019 [41] Sun et al., 2022 [42] Augustine et al., 2019 [43] Augustine et al., 2018 [44] Davis et al., 2021
Spatial count (SC)[37] (type of SCR model)	Systematic random or clustered may be best[24,30,40]	Close enough that individuals will be detected at multiple locations[24,29]	Minimum of 30; 60 (but will depend on detection probability and resight data)[35,41]	≥ 30 for all but the most detectable; >60 for reasonable precision for most; >60-120 if capture probability is low[4,25]	-		
Spatial Partial Identity Model (Categorical SPIM; catSPIM)[24,41,42]	Same as SC[24,30,41,42]	Similar to SC or with fewer cameras[41]	Similar to SC or less[24,30,41,42]	Similar to SC or less[24,30,41,42]	Similar to SC or less[24,30,41,42]	Similar to SC or less (such that no change in identity trait - e.g., antlers present/absent)[30]	
Spatial Partial Identity Model (2-flank SPIM)[24,43] (extension of SCR model augmented with data from partially identifying images)	Same as SCR[24,43] Flexible (can be used with paired-, single or hybrid camera configurations and single-or paired stations)[44] Regular, closely spaced cameras (relative to animal's home range sizes) ideal (more likely to capture both sides of animal)[43]	Fewer cameras than SCR (or same number of cameras but larger sampling area) Note - larger sampling areas preferred (less uncertainty associated with individual identification as fewer samples collected on the periphery of the camera array)[43]	Similar to SCR or less[24,43]	Similar to SCR or less[24,43]	Similar to SCR or less[24,43]	Similar to SCR or less[24,43]	

Approach	Camera arrangement	Camera spacing	Number of cameras	Camera days per camera location	Total number of camera days	Survey duration	References
Random encounter models (REM)[19,45]	Random with respect to movement[vi,2,4,45,46] Systematic[46] Systematic random[vii,4] Stratified random[4] Stratified targeted[viii,4]	No minimum; Ideally ≥ 1 km[4] Spatially independent[45] > home range diameter; 1-2 km without home range size, closer if using mixed models[4]	Minimum of 20; ideally >50[4,19]; Dependent on species' density[4]	No minimum; ideally >30[4]	Minimum of 10 detections; Ideally > 20 detections; Often 2,000 total camera days[2,19] 1,000-10,000 for most, if activity & speed are to be estimated[47] >2000 for low-density carnivores / rare ungulates[4]	Ideally < 12 months[4] No maximum[19]	[45] Rowcliffe et al., 2013 [46] Loonam et al., 2021 [47] Rowcliffe et al., 2016 [48] Nakashima et al., 2018 [49] Moeller et al., 2023 [50] Becker et al., 2022 [51] Huggard, 2018 [52] Warbington et al., 2020 [53] Howe et al., 2017 [54] Moeller et al., 2018 [55] Ridout & Linkie, 2009 [56] Rowcliffe et al., 2014
Random encounter and staying time (REST)[48]	Same as REM[49,50]						
Time in front of the camera (TIFC)[50-52]	Random or stratified random (representative) with respect to movement[50]	Same as REM[49,50]					
Distance sampling (DS)[53]	Random with respect to movement, pointing in either random or consistent direction[24,46] Systematic[46] Random or targeted across known density gradient[49]	Dependent on spatial extent of interest[49]					

Approach	Camera arrangement	Camera spacing	Number of cameras	Camera days per camera location	Total number of camera days	Survey duration	References
Time-to-event (TTE) model[53] Space-to-event (STE) model[53] Instantaneous sampling (IS)[53]	Random with respect to movement[46] Systematic[46] Systematic random[46]	No minimum required if random sampling used[53] None (uses instantaneous snapshots)[54]	Dependent on species density and distribution (e.g., more cameras with lower density and more clumped distribution)[53] Minimum of 20; ideally > 50[54]	No minimum[53]	Dependent on species density and distribution[54]	None required If demographic and geographic closure assumptions are not met (Appendix A - Table A1), the estimate will be the mean abundance or density in study area during the survey[54]	
Behaviour	Ideally, random; Stratified[4] Usually targeted[4]	Objective-dependent[4] Ideally, independant (larger than HR or > 1 km)[55,56]	Activity patterns: Enough to obtain > 100 detections[55,56] > 20 per stratum[4]	-	-	Dependent on behavioural metric (e.g., if it occurs during a certain period)[4]	

[i] **Spatially independent for species diversity and richness:** locations should be independent, meaning that any two locations do not sample the same community of animals. Note that this may be hard to achieve when considering the movement distances of some species, such as big cats, and in practice, a camera spacing of 1-2 km is often used (e.g., Tobler et al., 2008; Ahumada et al., 2011; Kinnaird & O'Brien, 2012)

[ii] **Paired design for CR:** higher chance of recognizing all individuals captured in a survey; using two cameras also decreases the chances of missing captures entirely (Tobler et al., 2008).

[iii] **Targeted design for CR:** This design is commonly used when estimating densities of marked populations (e.g., spatially explicit capture-recapture [SECR; Borchers & Efford, 2008; Efford, 2004; Royle & Young, 2008]) or behaviour studies. However, targeted sampling may impede the ability to draw inferences beyond the survey area.

[iv] **Spatially independent CR:** "camera locations should be sufficiently close to one another such that individuals are picked up across more than one location" (Wearn & Glover-Kapfer, 2017).

[v] **Species-dependent (home range size) for CR/CMR:** There is a trade-off between density and survey extent: 10-30 individuals exposed with a camera location density of at least 2-4 per smallest home range.

[vi] **Random design for REM models:** Note that species with very restricted distributions in a landscape are best sampled using a stratified design (Wearn & Glover-Kapfer, 2017).

[vii] **Systematic random design for REM:** to ensure a minimum separation between cameras (Wearn & Glover-Kapfer, 2017)

[viii] **Stratified targeted for REM:** species that are highly restricted in occurrence (Wearn & Glover-Kapfer, 2017)