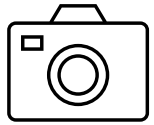
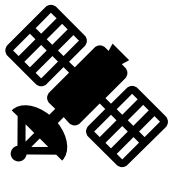
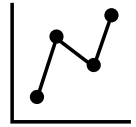
Urban Monitoring Methods Factsheet

Monitoring Method	Standard Ecological Surveys	Passive Acoustic Monitoring	DNA Analysis	Camera Trapping	Remote Sensing	Metrics and indices
	The suite of surveys undertaken to support planning. Typically focusing on habitats and protected species 	Citizen Science Suitable The collection of audio data from automated devices that can be left in situ for a period of time. 	Citizen Science Suitable The analysis of DNA from tissue, faeces, fur or environmental samples (water, soil, air) to determine the species or species assemblage present 	Citizen Science Suitable The collection of visual data from automated devices that can be left in situ for a period of time 	The use of reflected or emitted radiation (e.g., light) to obtain detailed images of an object or location of interest. e.g. LiDAR 	Methods intended to provide consistent and often quantitative assessments of biodiversity 
Landscape Scale of Use Site	Variable cost-effectiveness when upscaling to landscape level application Typically designed to support site-level assessments, e.g., species presence/absence	Noise pollution via soundscape analysis Species diversity via soundscape analysis Species presence via manual or automated analysis	Support habitat condition/quality assessments from environmental samples based on inferences from species diversity/assemblages Species richness from environmental or bulk tissue samples Species presence/identification	Comparison between sites to determine occupancy, density and activity patterns. Assess site wide species richness Assess location specific species richness or investigate a specific habitat feature (e.g., badger sett)	Typically used to support landscape-level assessments, e.g., connectivity, canopy cover, carbon sequestration, habitat mapping. Unlikely to be cost-effective at individual site level	Acoustic indices to assess all (e.g., species richness) or part (e.g. anthropogenic noise) of a soundscape Spatial or temporal comparisons Assess and inform site level habitat management, e.g. using UKHab and Defra Biodiversity Metric
Pros	Covers all protected species Widely accepted methods Increasing use of new technologies Accurate results	Can record all vocalising species – typically bats but increasing options (e.g., birds/invertebrates) Automated collection of large datasets Increasingly accurate automated analysis options	Comparatively low cost Covers all taxonomic groups and a range of environmental samples Covers typically underrepresented aspects of biodiversity Reduced number of survey visits	Can record a range of mobile species Automated collection of large data sets Can address a range of monitoring questions Increasingly automated process	Highly detailed datasets Contribute to a range of monitoring questions Reduce survey effort and number of visits Range of application methods for different cost levels	Consistent means of assessment Allows for consistent comparisons – spatial and/or temporal Range of options and applications
Cons	Species-specific technical expertise / equipment requirements Resource and time intensive = significant costs May not suit all monitoring questions	GDPR considerations in public spaces Equipment must be left on site – risk of theft/damage Formatting of devices / analysis of data / verification of automated results can be time consuming and requires technical expertise	Technical expertise to interpret results Dependent on comprehensive DNA libraries Cannot assess abundance Potential for contamination	GDPR considerations in public spaces Equipment must be left on site – risk of theft/damage Limited detection range Analysis can be time consuming and require technical expertise to verify identification	Can require expensive equipment and highly specialised skills May not be cost-effective in some circumstances Risk of data gaps/occlusion	Potential to oversimplify May require specialist skills Reliability of some options (e.g. acoustic indices) not widely agreed Reliant on input data quality