

Supplementary

Review of Satellite Remote Sensing and Unoccupied Aircraft Systems for Counting Wildlife on Land

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Table S1. Commercial high-resolution satellites that can detect objects less than one metre. Image resolution is measured as Ground Sampling Distance (GSD), the distance between two consecutive pixel centres measured on the ground in metres. The information was collated in November 2023 using the ESA eoPortal [133], CEOS database [134], OSCAR database [135], Satellite Imaging Corporation database [136] or through direct correspondence with the provider. The launch date, mission status in 2023, and expected end of life (EOL) is reported, including EOL to be determined (TBD). Mission status is classified as planned (upcoming launch planned), operational (all systems fully working), and decommissioned (no longer functional).

Provider	Sensor	Launch date	Mission status	End of Life (EOL)	Image bands	Panchromatic mode GSD	Multispectral mode GSD
Airbus, European	Pléiades-1A	17 December 2011	Operational (extended)	December 2024	Panchromatic, Multispectral bands (RGB, NIR)	50 cm	200 cm
	Pléiades-1B	2 December 2012	Operational (extended)	December 2024	Panchromatic, Multispectral bands (RGB, NIR)	50 cm	200 cm
	Pléiades Neo	28 April 2021	Operational. Mission lifetime of >10 years	TBD	Panchromatic, Multispectral bands (RGB, NIR, Red Edge, Deep Blue)	30 cm	120 cm
Beijing Space View Tech Co Ltd/Space View, China	* SuperView-1 / GaoJing-1	28 December 2016 (SuperView-1 01 and SuperView-1 02) and 9 January 2018 (SuperView-1 04 and SuperView-1 06)	Operational. Mission lifetime of 8 years	≥2023	Panchromatic, Multispectral bands (RGB, NIR)	50 cm	200 cm
Korea Aerospace Research Institute (Provider is Satrec Initiative), Korea	KOMPSAT 3 / Arirang-3	17 May 2012	Operational (extended)	May 2024	Panchromatic, Multispectral bands (RGB, NIR)	50-70cm	220-280 cm
	KOMPSAT 3A / Arirang-3A	25 March 2015	Operational (extended)	December 2023	Panchromatic, Multispectral bands (RGB, NIR)	50-70 cm	220-280 cm
Maxar, United States	IKONOS (formally IKONOS-2)	24 September 1999	Decommissioned	31 March 2015	Panchromatic, Multispectral bands (RGB, NIR)	80 cm	320 cm
	QuickBird-2	18 October 2001	Decommissioned	17 December 2014	Panchromatic, Multispectral bands (RGB, NIR)	61 cm	244 cm (at 450 km) to 163 cm (at 300 km)
	WorldView-4	11 November 2016	Decommissioned	7 January 2019	Panchromatic, Multispectral bands (RGB, NIR)	31 cm	124 cm
	WorldView-1	18 September 2007	Operational (nominal)	September 2023	Panchromatic	50-55 cm	

	GeoEye-1 (formally OrbView-5)	6 September 2008	Operational (extended)	6 September 2023	Panchromatic, Multispectral bands (RGB, NIR)	41 cm	164 cm
	WorldView-2	8 Oct 2009	Operational (nominal)	31 December 2022	Panchromatic, Multispectral bands (RGB, NIR and 4 additional colours)	46 cm	180 cm
	WorldView-3	13 August 2014	Operational (nominal)	TBD	Panchromatic, Multispectral bands (8) in VNIR (Visible Near Infrared)	31 cm	124 cm (8 NVIR bands), 370 cm (8 SWIR bands), 30 cm (CAVIS bands)
Mohammed Bin Rashid Space Centre (MBRSC), UAE	KhalifaSat/ DubaiSat-3	29 October 2018	Operational (nominal)	October 2023	Panchromatic, Multispectral bands (RGB, NIR)	70 cm	298 cm
Planet	† SKYSAT	21 November 2013 to 18 August 2020	Operational (nominal)	TBD	Panchromatic, Multispectral (RGB, NIR)	50 cm (orthorectified); 86 cm (original resolution)	100 cm
Satrec Initiative (SI Imaging Services)	KOMPSAT-6	Expected launch August 2024	Planned. Mission lifetime of 5 years	October 2029	Panchromatic, Multispectral bands (RGB, NIR)	50 cm	300 cm
	KOMPSAT-7 / Arirang 7	Expected launch September 2024	Planned. Mission lifetime of 5 years	September 2029	Panchromatic, Multispectral bands (RGB, NIR)	30 cm	120 cm
	KOMPSAT-7A / Arirang-7A	Expected launch September 2025	Planned. Mission lifetime of 5 years	September 2030	Panchromatic, Multispectral bands (RGB, NIR)	30 cm	120 cm
	SpaceEye-T	Expected launch early 2024	Planned. Mission lifetime of 5 years, with potential to extend to 7 years	TBD	Panchromatic, Multispectral bands (4)	30 cm	120 cm
	SpaceEye-X	Launch date TBD	Planned	TBD	Panchromatic, Multispectral bands (4)	50 cm	200 cm
	SpaceEye-M	Launch date TBD	Planned	TBD	Panchromatic, Multispectral bands (4)	80 cm	320 cm

* SuperView-1 (also known as GaoJing-1) is a constellation of four commercial remote sensing satellites. These are SuperView-1 01 / GaoJing-1 01, SuperView-1 02 / GaoJing-1 02, SuperView-1 04 / GaoJing-1 03 and SuperView-1 06 / GaoJing-1 05.

† SKYSAT is a constellation of 21 commercial high-resolution remote sensing satellites.

Table S2. Commercial synthetic-aperture radar (SAR) satellites that can detect objects smaller than one metre. The information was collated in November 2023 from multiple sources [133,134,137-143]. Image resolution is measured as Ground Sampling Distance (GSD), the distance between two consecutive pixel centres measured on the ground in metres. Capella Space is the first US company to launch and operate SAR satellites. ICEYE is currently a constellation of 21 satellites, with plans for expansion to 48 satellites by 2024. The Italian Space Agency (ASI)'s constellation of small satellites for mediterranean basin observation (COSMO-SkyMed) is part of The European Space Agency (ESA) Third Party Missions Programme, in which ESA has an agreement with ASI to distribute data products from the mission. The first-generation COSMO-SkyMED (CSK) satellites consist of four satellites and the second Generation of COSMO-SkyMed (CSG) satellites consist of two satellites (CSG-1 and CSG-2) with sub-1m resolution capabilities and are in the same orbit. The KOMPSAT (Korean Multi-Purpose Satellite) program is part of the Korean government's space development program. Umbra's constellation currently includes eight satellites with additional constellation growth planned.

Provider	Sensor	Launch date	Mission status	End of Life (EOL)	SAR image mode	GSD	Source
Capella Space	Capella-1 / Denali	3 December 2018	Decayed (decay on 25 January 2023)	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-2 / Sequoia	31 August 2020	Decayed (decay on 28 February 2023)	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-3 / Whitney-1	24 January 2021	Decayed (decay on 26 February 2023)	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-4 / Whitney-2	24 January 2021	Decayed (8 April 2023)	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-5 / Whitney-3	30 June 2021	Decayed (23 February 2023)	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-6 / Whitney-4	15 May 2021	Operational	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-7 / Whitney-5	13 January 2022	Decayed (26 August 2023)	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-8 / Whitney-6	13 January 2022	Decayed (6 September 2023)	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-9 / Whitney-7	16 March 2023	Operational	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-10 / Whitney-8	16 March 2023	Operational	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-11 / Acadia-1	23 August 2023	Operational	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[133,137]
Capella Space	Capella-13 / Acadia-3	Launch date TBD	Planned	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[137,138]

Capella Space	Capella-14 / Acadia-3	Launch date TBD	Planned	December 2027	Spotlight; Sliding-spotlight	25 cm; 50 cm	[137,138]
ICEYE	ICEYE	13 January 2018	Operational (Nominal). Mission lifetime of >3 years	December 2023	Spot fine	50 cm	[133,134]
Italian Space Agency (ASI)	CSK-1	8 June 2007	Operational	>2023	Spotlight-2A; Spotlight-2	30-70 cm; 90 cm	[134,139,140]
Italian Space Agency (ASI)	CSK-2	9 December 2007	Operational	>2023	Spotlight-2A; Spotlight-2	30-70 cm; 90 cm	[134,139]
Italian Space Agency (ASI)	CSK-3	25 October 2008	Operational	>2023	Spotlight-2A; Spotlight-2	30-70 cm; 90 cm	[134,139]
Italian Space Agency (ASI)	CSK-4	6 November 2010	Operational	>2023	Spotlight-2A; Spotlight-2	30-70 cm; 90 cm	[134,139]
Italian Space Agency (ASI)	CSG-1	18 December 2019	Operational. Mission lifetime of 7 years and 2 prolonged	31 December 2028	Spotlight-2B; Spotlight-2C	60cm; 80 cm	[133,141–143]
Italian Space Agency (ASI)	CSG-2	1 February 2022	Operational. Mission lifetime of 7 years and 2 prolonged	31 December 2028	Spotlight-2B; Spotlight-2C	60cm; 80 cm	[133,141–143]
SI Imaging	KOMPSAT-5	22 August 2013	Operational (Extended)	December 2023	UH Mode (Spotlight Mode)	Up to 84 cm	[134,140]
SI Imaging	KOMPSAT-6	Expected launch August 2024	Planned	October 2029	High resolution A	50 cm	[134,138]
Umbra	Umbra SAR- 2001 / Umbra- 01	30 June 2021	Operational. Mission lifetime of 5 years	>2035	Spotlight	25 cm	[138,139]
Umbra	Umbra-02	13 January 2022	Operational	>2035	Spotlight	25-400 cm	[138,139]
Umbra	Umbra-03	25 May 2022	Operational	>2035	Spotlight	25-400 cm	[138,139]
Umbra	Umbra-04	3 January 2023	Operational	>2035	Spotlight	25-400 cm	[138,139]
Umbra	Umbra-05	3 January 2023	Operational	>2035	Spotlight	25-400 cm	[138,139]
Umbra	Umbra-06	15 April 2023	Operational	>2035	Spotlight	25-400 cm	[138,139]
Umbra	Umbra-07	11 November 2023	Operational	>2035	Spotlight	25-400 cm	[138,139]
Umbra	Umbra-08	11 November 2023	Operational	>2035	Spotlight	25-400 cm	[138,139]

Table S3. Comparison of costs between commercial synthetic-aperture radar (SAR) satellites that can detect objects smaller than one metre. The order requirements for tasked and archival imagery differ for each company. Costing is dependent on multiple parameters, including minimum area and whether archival/tasked imagery. Image resolution is measured as Ground Sampling Distance (GSD) for square pixels (i.e., the distance between two consecutive pixel centres measured on the ground in metres) or Maximum Ground Resolution (MGR) for rectangular pixels (measured as azimuth x range). SAR satellites can image in different modes; spotlight and sliding spotlight modes produce higher resolution images. Spotlight imaging is when a beam is focused on a single point of Earth through the acquisition, whereas in sliding spotlight, the acquisition angle is slowly varied to slide the illumination point along the ground to cover a larger area. The Italian Space Agency have Cosmo-SkyMed (CSK) and Cosmo Second Generation (CSG) SAR satellites. The UMBRA single-looked product offers shorter dwell times, optimised for very efficient and dense collection, whereas the multi-looked product has longer dwell times to reduce speckle and aid visual interpretation. Umbra SAR satellite constellations are Umbra SAR-2001, Umbra-02, Umbra-03, Umbra-04, Umbra-05 and Umbra-06. Capella Space satellite imagery products are available for purchase from Cloud Earth Observation Services (CLEOS) [144]. ICEYE archive and new tasking products is freely available for scientific research and development activities (see [145] for eligibility requirements and proposal submission).

Satellite image provider	Sensor	Data type	Tasking level	GSD	* Price per image (USD)	Minimum order	† Educational discount (%)
Capella Space	Capella-1 to Capella-14 (Spotlight)	Archive data	NA	25-50 cm	Pricing on request	5x5 km	NA
		Tasked data	Routine	25-50 cm	Pricing on request	5x5 km	
		Tasked data	1-Day	25-50 cm	Pricing on request	5x5 km	
		Tasked data	3-Day	25-50 cm	Pricing on request	5x5 km	
		Tasked data	7-Day	25-50 cm	Pricing on request	5x5 km	
	Capella-1 to Capella-14 (Sliding spotlight)	Archive data	NA	25-50 cm	Pricing on request	5x10 km	
		Tasked data	Background (opportunistic tasking)	25-50 cm	Pricing on request	5x10 km	
		Tasked data	Routine	25-50 cm	Pricing on request	5x10 km	

		Tasked data	1-Day	25-50 cm	Pricing on request	5x10 km	
		Tasked data	3-Day	25-50 cm	Pricing on request	5x10 km	
		Tasked data	7-Day	25-50 cm	Pricing on request	5 x10 km	
EADS Astrium and German Aerospace Centre (DLR)	TerraSAR-X (Staring Spotlight mode)	Archive data	NA	Up to 25 cm	2,499	4 x 3.7 km	A limited amount of TerraSAR-X products will be provided to some proposals free of charge and will be delivered electronically, but must meet specific criteria.
		Tasked data	Standard (signed order sent up to 3 days before submission deadline)	Up to 25 cm	4,998	4 x 3.7 km	Discounts will be applied for larger order volumes, and for dedicated research programs and institutions contributing to the TerraSAR-X mission, especially by financial or operational support.
		Tasked data	Fast (signed order sent between 3-1 day before submission deadline)	Up to 25 cm	4,998 plus 408 surcharge	4 x 3.7 km	
		Tasked data	Urgent (Signed order sent less than 1 day before submission deadline)	Up to 25 cm	4,998 plus 918 surcharge	4 x 3.7 km	
Italian Space Agency (ASI)	CSK (Spotlight-2A)	Archive data	NA	30-70 cm	Pricing on request	5 x 7 km	Price for research and demonstration purposes (non-commercial and non-operational) are \$204/image for archive data and \$816/image for tasking. Results to be shared with e-GEOS and the Italian Space Agency. Orders may be handled with lower priority than commercial orders. Access to 30 cm and 60 cm resolution imagery subject to ad hoc authorisation
		Tasked data	NA	30-70 cm	Pricing on request	5 x 7 km	
		Archive data	NA	30-70 cm	Pricing on request	3.5 x 7 km	
		Tasked data	NA	30-70 cm	Pricing on request	3.5 x 7 km	
	CSG (Spotlight-2B)	Archive data	NA	60 cm	Pricing on request	10 x 10 km	
		Tasked data	NA	60 cm	Pricing on request	10 x 10 km	
	CSK	Archive data	NA	90 cm	663	10 x 10 km	

	(Spotlight-2)	Tasked data	NA	90 cm	4,080	10 x 10 km	
	CSG-1 and CSG-2 (Spotlight-2)	Archive data	NA	80 cm	663	5 x 10 km	
	CSG 2C (Spotlight-2)	Tasked data	NA	80 cm	4,080	5 x 10 km	
ICEYE	All constellations	Spot fine mode	NA	50 cm	Pricing on request	5x5 m	Can apply for free imagery through ESA. Some archival imagery available for free (see [145] for further details). There is also a limited-access program for university collaborations in the form of discounted data packages with university-focused licensing.
Umbra	All constellations	Spotlight mode for tasked and archive data	Single-looked product	25 cm	3,000	4x4 m	No official discount, but open to a discussion with UMBRA regarding user's particular use-case.
			Single-looked product	35 cm	1,350	4x4 m	
			Single-looked product	50 cm	750	4x4 m	
			Multi-looked product	25 cm	1,350	4x4 m	
			Multi-looked product	35 cm	850	4x4 m	
			Multi-looked product	50 cm	600	4x4 m	
SI Imaging	KOMPSAT-5 (UH Mode - Spotlight Mode)	Archive data	NA	Up to 85 cm	1,400	5x5 km	An academic discount is available for universities. Must provide a short description of the project to apply for discount.
		Tasked data	Standard	Up to 85 cm	2,800	5x5 km	
		Tasked data	Priority	Up to 85 cm	3,300	5x5 km	

* Costing is listed in U.S. dollar (USD). Quote provided by satellite image providers in U.S. dollar (USD) for UMBRA and SI Imaging and euros (€) for TerraSAR-X, CSG and CSK satellites. Conversion rate applied: £1.00 = \$1.21 USD and €1.00 = \$1.02 USD. Prices for UMBRA are not inclusive of local tax or import rules, which may apply. All quotes provided in 2023, except TerraSAR-X, CSG and CSK satellites which are based on price listings from e-geos released on 22 February 2021 [140]. For Cosmo-Skymed satellites, imagery is defined as 'archive' 30 days after collection. Access to Cosmo-Skymed 30 cm and 60 cm resolution imagery is subject to ad hoc authorization. TeraSAR-X is sold by the scene, not by the total area of interest.

† Other discounts may be available

Table S4. Comparison of costs between commercial satellite companies that provide imagery per square km for a minimum order. Planet provides imagery based on annual subscriptions (see main text for details). Each company has different order requirements for tasked and archival imagery, with the costs dependent on multiple parameters, including minimum area. Image resolution is measured as Ground Sampling Distance (GSD), the distance between two consecutive pixel centres measured on the ground in metres.

Satellite image provider	Sensor	‡ Data type	Tasking level	GSD	Product (Band)	* Price per km ² (USD)	Minimum order	Minimum width (km)	Standard cloud cover limit (%)	†Educational discount (%)
Airbus	Pleiades Neo	Archive data	NA	30 cm	Panchromatic	18.36	25km ²	NA	NA	NA
Airbus	Pleiades	Archive data	NA	50 cm	Panchromatic	10.20	25km ²	NA	NA	NA
Airbus	Vision-1	Archive data	NA	87 cm	Panchromatic	5.14	25km ²	NA	NA	NA
Airbus	Pleiades Neo	Tasked data	OnePlan	30 cm	Panchromatic	26.52	100km ²	5 km	10	50
Airbus	Pleiades	Tasked data	OnePlan	50 cm	Panchromatic	17.34	100km ²	5 km	10	50
Airbus	Vision-1	Tasked data	OnePlan	87 cm	Panchromatic	7.87	100km ²	5 km	10	50
Airbus	Pleiades Neo	Tasked data	OnePlan ^{Pro}	30 cm	Panchromatic	51.00	100km ²	5 km	10	50
Airbus	Pleiades	Tasked data	OnePlan ^{Pro}	50 cm	Panchromatic	31.62	100km ²	5 km	10	50
Airbus	Vision-1	Tasked data	OnePlan ^{Pro}	87 cm	Panchromatic	11.80	100km ²	5 km	10	50
GEOSAT	GEOSAT 2 / Deimos-2	Archive data	NA	75 cm	3-4 band pansharpened	6.12	25km ²	NA	15	45
GEOSAT	GEOSAT 2 / Deimos-2	Archive data	NA	75 cm (Pan) 3 m (MS)	Panchromatic and multispectral 4 band (B, G, R, NIR) bundle	6.12	25km ²	NA	15	45
GEOSAT	GEOSAT 2 / Deimos-2	Archive data	NA	75 cm (Pan) 3 m (MS)	Panchromatic and multispectral 4 band (B, G, R, NIR) stereo-pair	10.20	25km ²	NA	15	45
GEOSAT	GEOSAT 2 / Deimos-2	Tasked data	Standard programming	75 cm	3-4 band pansharpened	12.24	100km ²	NA	15	45
GEOSAT	GEOSAT 2 / Deimos-2	Tasked data	Standard programming	75 cm (Pan) 3 m (MS)	Panchromatic and multispectral 4 band (B, G, R, NIR) bundle	12.24	100km ²	NA	15	45
GEOSAT	GEOSAT 2 / Deimos-2	Tasked data	Standard programming	75 cm (Pan) 3 m (MS)	Panchromatic and multispectral 4 band (B, G, R, NIR) stereo-pair	20.40	100km ²	NA	15	45
GEOSAT	GEOSAT 2 /	Tasked data	Priority	75 cm	3-4 band	22.44	100km ²	NA	15	45

	Deimos-2		Programming (orders placed <24 hr prior to acquisition)		pansharpened					
GEOSAT	GEOSAT 2 / Deimos-2	Tasked data	Priority Programming (orders placed <24 hr prior to acquisition)	75 cm (Pan) 3 m (MS)	Panchromatic and multispectral 4 band (B, G, R, NIR) bundle	22.44	100km ²	NA	15	45
GEOSAT	GEOSAT 2 / Deimos-2	Tasked data	Priority Programming (orders placed <24 hr prior to acquisition)	75 cm (Pan) 3 m (MS)	Panchromatic and multispectral 4 band (B, G, R, NIR) stereo-pair	36.72	100km ²	NA	15	45
Maxar	NA	Archive data	NA	50 cm/60 cm	Panchromatic	14.00	25km ²	NA	15	30
Maxar	NA	Archive data	NA	40 cm	Panchromatic	16.00	25km ²	NA	15	30
Maxar	NA	Archive data	NA	30 cm	Panchromatic	19.00	25km ²	NA	15	30
Maxar	NA	Archive data	NA	50 cm/60 cm	3-4 band pansharpened	17.50	25km ²	NA	15	30
Maxar	NA	Archive data	NA	40 cm	3-4 band pansharpened	19.50	25km ²	NA	15	30
Maxar	NA	Archive data	NA	30 cm	3-4 band pansharpened	22.50	25km ²	NA	15	30
Maxar	NA	Archive data	NA	50 cm/60 cm	Multispectral 8 band data	19.00	25km ²	NA	15	30
Maxar	NA	Archive data	NA	40 cm	Multispectral 8 band data	21.00	25km ²	NA	15	30
Maxar	NA	Archive data	NA	30 cm	Multispectral 8 band data	24.00	25km ²	NA	15	30
Maxar	NA	Tasked data	NA	50 cm/60 cm	Panchromatic	24.00	100km ²	NA	15	30
Maxar	NA	Tasked data	NA	40 cm	Panchromatic	26.00	100km ²	NA	15	30
Maxar	NA	Tasked data	NA	30 cm	Panchromatic	29.00	100km ²	NA	15	30
Maxar	NA	Tasked data	NA	50 cm/60 cm	3-4 band pansharpened	27.50	100km ²	NA	15	30
Maxar	NA	Tasked data	NA	40 cm	3-4 band pansharpened	29.50	100km ²	NA	15	30

Maxar	NA	Tasked data	NA	30 cm	3-4 band pansharpened	32.50	100km ²	NA	15	30
Maxar	NA	Tasked data	NA	50 cm/60 cm	Multispectral 8 band data	29.00	100km ²	NA	15	30
Maxar	NA	Tasked data	NA	40 cm	Multispectral 8 band data	31.00	100km ²	NA	15	30
Maxar	NA	Tasked data	NA	30 cm	Multispectral 8 band data	34.00	100km ²	NA	15	30
SI Imaging	KOMPSAT-3A	Archived data	NA	40 cm (Pan) 1.6 m (MS)	Panchromatic or bundle (panchromatic and multispectral)	8.00	25km ²	5 km	NA	40
SI Imaging	KOMPSAT-3A	Tasked data	Standard	40 cm (Pan) 1.6 m (MS)	Panchromatic or bundle (panchromatic and multispectral)	18.00	100km ²	5 km	10	40
SI Imaging	KOMPSAT-3A	Tasked data	Priority	40 cm (Pan) 1.6 m (MS)	Panchromatic or bundle (panchromatic and multispectral)	28.00	100km ²	5 km	10	40
SI Imaging	KOMPSAT-3A	Tasked data	Priority plus	40 cm (Pan) 1.6 m (MS)	Panchromatic or bundle (panchromatic and multispectral)	43.00	100km ²	5 km	NA	40
SI Imaging	KOMSAT-3	Archived data	NA	50 cm (Pan) 2 m (MS)	Panchromatic or bundle (panchromatic and multispectral)	8.00	25km ²	5 km	NA	40
SI Imaging	KOMSAT-3	Tasked data	Standard	50 cm (Pan) 2 m (MS)	Panchromatic or bundle (panchromatic and multispectral)	16.00	100km ²	5 km	10	40
SI Imaging	KOMSAT-3	Tasked data	Priority	50 cm (Pan) 2 m (MS)	Panchromatic or bundle (panchromatic and multispectral)	26.00	100km ²	5 km	10	40
SI Imaging	KOMSAT-3	Tasked data	Priority plus	50 cm (Pan) 2 m (MS)	Panchromatic or bundle (panchromatic and multispectral)	40.00	100km ²	5 km	NA	40

* Costing is listed in U.S. dollar (USD). Quote provided by satellite image providers in U.S. dollar (USD) for SI imaging and Maxar and euros (€) for Airbus and GEOSAT. Conversion rate applied: €1.00 = \$1.02 USD. All quotes provided in 2022, except GEOSAT satellites, which are based on price listings from e-geos released on 22 February 2021 [140]. All prices for GEOSAT-2/Deimos-2 refer to up to 5 single user licences and academic user licences are available for universities and research entities.

† Other discounts may be available

‡ To qualify for archive pricing, imagery must be at least 7 days old for GEOSAT-2/Deimos-2. For Airbus, archive prices apply as soon as the data is available in the Airbus imagery catalogue.

Table S5. Examples of successful crowdsourcing campaigns to estimate population size of wildlife on land using VHR satellite remote sensing (SRS) and unoccupied aircraft systems (UAS). The campaigns are listed in order of release date, with references (see [40, 146-154]) in a separate column. The platform Tomnod has been replaced by GeoHIVE.

Crowdsourcing Campaign	Species	Program initiated	Remote sensing method	Tile size	Resolution	Animal location	Platform	Number of participants	Data type	Reference
SAVMAP campaign 2014	Large mammals in African savanna	2014	UAS	320 x 240 m	8 cm	Land	MicroMappers	232	Count	[146]
Satellites Over Seals (SOS)	Weddell seal	2016	SRS	500 x 500 m	31-60 cm, depending on campaign	Ice	Tomnod	5,000 to 241,478 depending on campaign	Presence/Absence and count	[40, 147-149]
Satellites Over Seals (SOS)	Crabeater seal	2019	SRS	500 x 500 m	~31-50 cm	Ice	Tomnod	2,225	Presence/Absence	[150]
Año Nuevo Island – Animal Count	Various seals and sea lions	2019	UAS	700 x 700 pixel		Land	Zooiverse	>1,500	Count	[151]
Walrus From Space	Walrus	2021	SRS	500 x 500 m	31-50 cm	Haul-out	GeoHIVE	>11,000 in first campaign. Additional campaigns ongoing.	Presence/Absence	[152]
Drones for Ducks	Ducks, geese, cranes and other birds	2022	UAS	2.56 x 3.42 m to 10.24 x 13.68 m	0.5 – 2 cm	Wetland	Zooiverse	Ongoing (5,732 up to 15 November 2023)	Count	[153]
Albatrosses From Space	Wandering albatross	2022	SRS	160 x 160 m	31 cm	Breeding ground	GeoHIVE	639	Count	[154]