

Differential reporting of biodiversity in two citizen science platforms during COVID-19 lockdown in Colombia.

Supplementary material

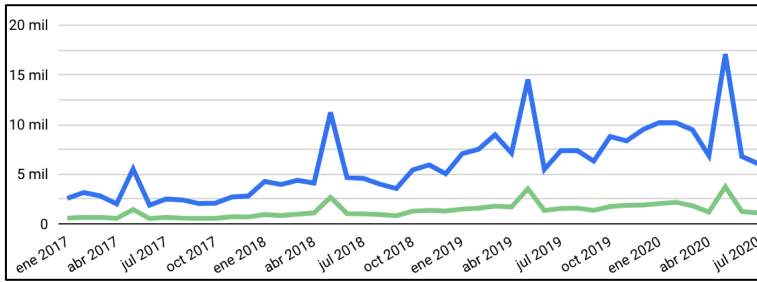


Figure S1. Number of checklists (blue) and eBirders (green) submitted for Colombia per month from January 2017 to October 2020. The peak in submissions and participants shown each year coincides with Global Big Day (GBD) which always takes place in early May (source: eBird Colombia dashboard).

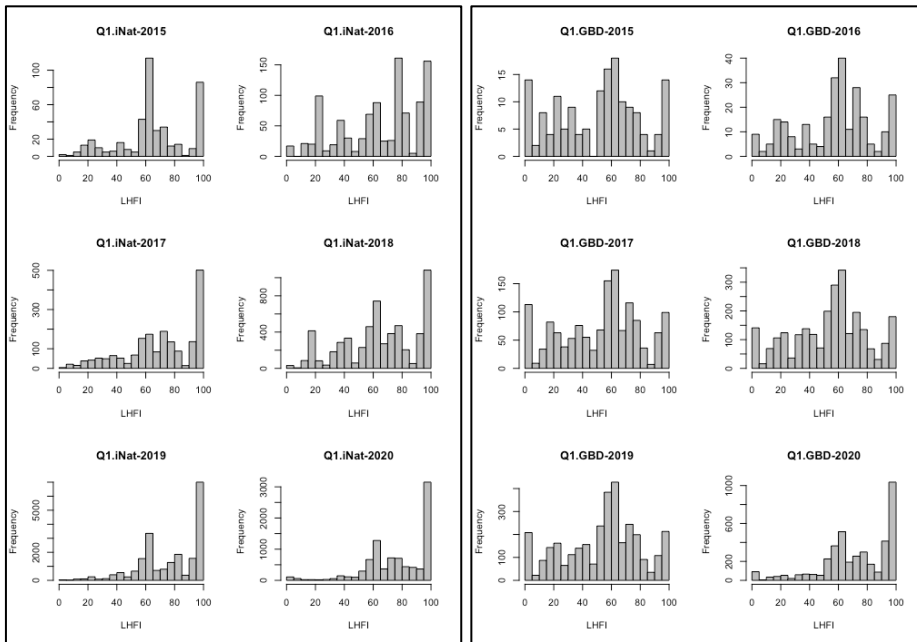


Figure S2. Histograms showing the distribution of records for iNaturalist (left) and checklists for eBird (right) according to Colombia's Legacy-adjusted Human Footprint Index from 2015-2020. Data was subsequently split into records with LFHI values greater than or equal to 90 and records with values less than 90.

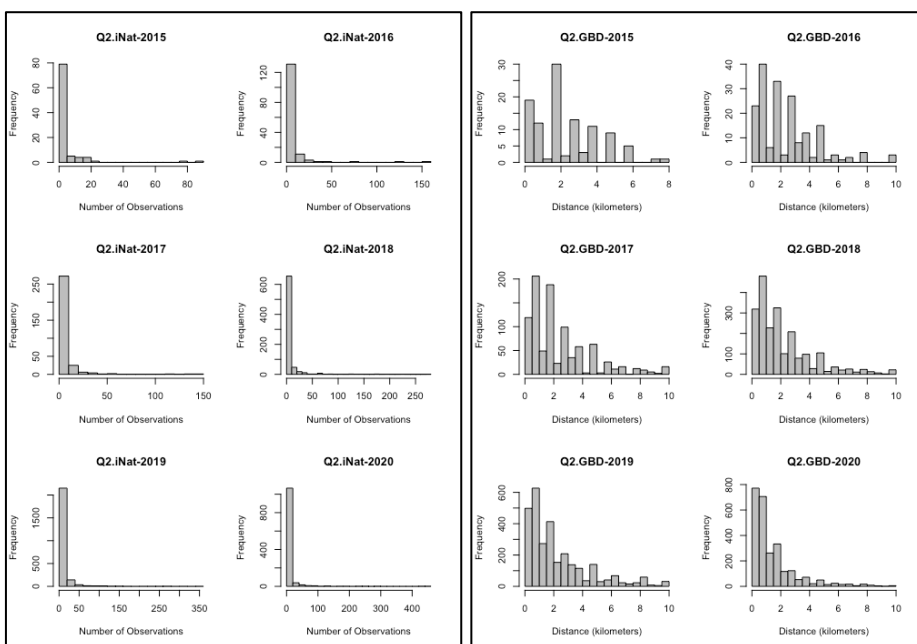


Figure S3. Histograms showing the distribution of sampling effort for iNaturalist as number of observations submitted per observer (left data was subsequently split into observers with 5 or less observations and observers with more than 5 observations) and for eBird as distance covered per checklist (right). For iNaturalist. For eBird-distance data was subsequently split into checklists with effort of 1 km or less and checklists with effort greater than 1 km.

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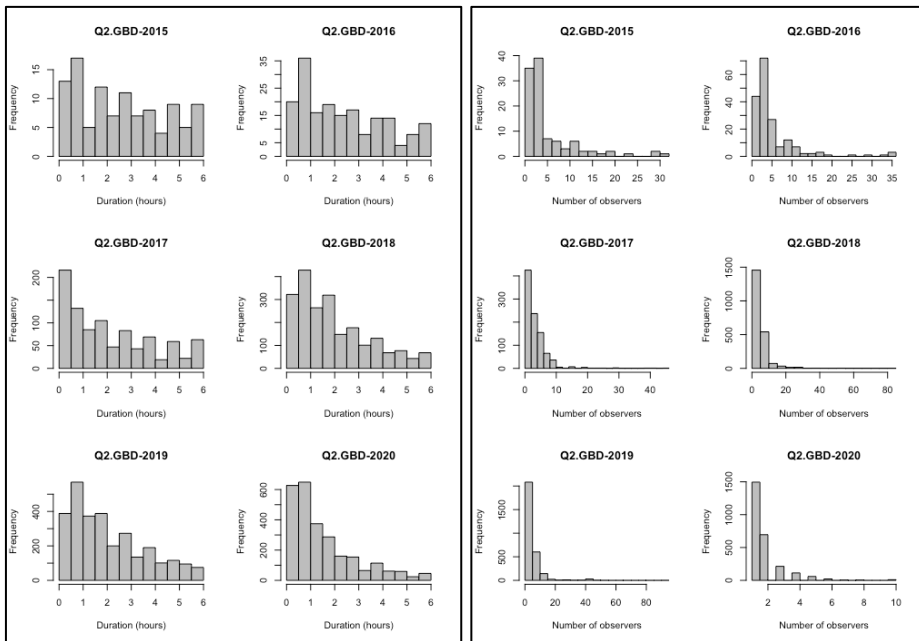


Figure S4. Histograms showing the distribution of sampling effort during our study periods from 2015-2020 for eBird as duration per checklist (left) and number of observers per checklist (right). For eBird-duration data was subsequently split into checklists with effort of 1 hour or less and checklists with effort greater than 1 hour. For eBird-group size data was subsequently split into checklists done by a single observers and checklists done by more than one observer.

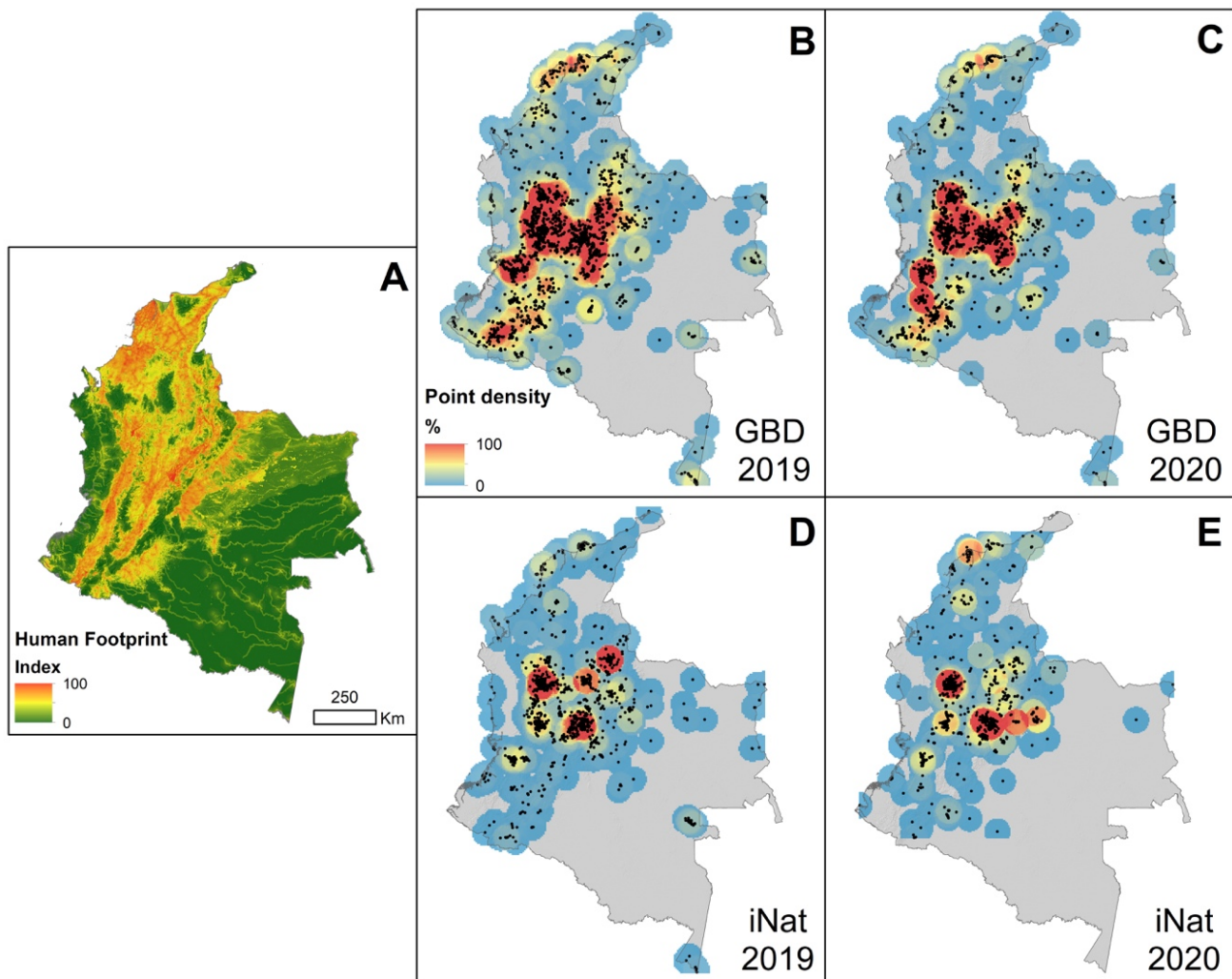


Figure S5. A) Legacy-adjusted Human Footprint Index for Colombia (Correa Ayram et al., 2020); B-C) Record distribution in iNaturalist from March 25th to April 25th of 2019 and 2020; D-E) Checklist distribution in eBird from Global Big Days of 2019 and 2020.

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Table S1. Statistical output for logistic regressions of year vs. the proportion of records for iNaturalist and checklists for eBird that were submitted from sites with Legacy-adjusted Human Footprint Index values greater than or equal to 90 (relatively dense human settlements) from 2015-2020.

Dataset	Coeff.	Est.	SE	z-value	Pr(> z)	Res.Dev	Res.DF	Dev/DF
iNat	2020 (b0)	-0.46	0.02	-21.34	<2.00E-16	51,722	39,235	1.32
iNat	2015 (b1)	-0.81	0.12	-6.85	7.20E-12	-	-	-
iNat	2016 (b2)	-0.67	0.08	-8.71	<2.00E-16	-	-	-
iNat	2017 (b3)	-0.23	0.05	-4.31	1.67E-05	-	-	-
iNat	2018 (b4)	-0.62	0.04	-16.83	<2.00E-16	-	-	-
iNat	2019 (b5)	0.09	0.03	3.38	7.00E-04	-	-	-
GBD	2020 (b0)	-0.58	0.03	-17.69	<2.00E-16	10,419	11,733	0.89
GBD	2015 (b1)	-1.47	0.25	-5.83	5.69E-09	-	-	-
GBD	2016 (b2)	-1.30	0.18	-7.01	2.32E-12	-	-	-
GBD	2017 (b3)	-1.47	0.09	-16.43	<2.00E-16	-	-	-
GBD	2018 (b4)	-1.58	0.07	-21.81	<2.00E-16	-	-	-
GBD	2019 (b5)	-1.64	0.07	-24.33	<2.00E-16	-	-	-

Table S2. Statistical output for generalized linear models of year vs. the number of records for iNaturalist and checklists for eBird that were submitted from sites with Legacy-adjusted Human Footprint Index values less than 90 from 2019-2020.

Dataset	Model	Coeff.	Est.	SE	z-value	Pr(> z)	Res.Dev	Res.DF	Dev/DF	Theta	SE
iNat	Poisson	2019 (b0)	4.16	0.001	3712.82	<2.00E-16	89,954	18,011	4.99	-	-
iNat	Poisson	2020 (b1)	0.02	0.002	8.35	<2.00E-16	-	-	-	-	-
iNat	Negative binomial	2019 (b0)	4.16	0.003	1551.09	<2.00E-16	19,852	18,011	1.10	13.54	0.19
iNat	Negative binomial	2020 (b1)	0.02	0.005	3.47	5.E-04	-	-	-	-	-
GBD	Poisson	2019 (b0)	3.90	0.003	1491.49	<2.00E-16	67,435	5,536	12.18	-	-
GBD	Poisson	2020 (b1)	0.19	0.004	52.59	<2.00E-16	-	-	-	-	-
GBD	Negative binomial	2019 (b0)	3.90	0.011	344.5	<2.00E-16	6,861	5,537	1.24	2.79	0.06
GBD	Negative binomial	2020 (b1)	0.19	0.017	11.6	<2.00E-16	-	-	-	-	-

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Table S3. Statistical output for logistic regressions of year vs. six metrics of level and type of participation in iNaturalist and eBird for out study periods.

Dataset	Metric	Coeff.	Est.	SE	z-value	Pr(> z)	Res.Dev	Res.DF	Dev/DF
iNat	Observer effort	2020 (b0)	-1.37	0.07	-18.61	<2.00E-16	5,659	4,825	1.17
iNat	Observer effort	2015 (b1)	-0.23	0.28	-0.82	0.42	-	-	-
iNat	Observer effort	2016 (b2)	0.32	0.20	1.60	0.11	-	-	-
iNat	Observer effort	2017 (b3)	0.12	0.15	0.79	0.43	-	-	-
iNat	Observer effort	2018 (b4)	0.23	0.11	2.01	0.04	-	-	-
iNat	Observer effort	2019 (b5)	0.75	0.09	8.84	<2.00E-16	-	-	-
iNat	Curator effort	2020 (b0)	-0.22	0.02	-10.42	<2.00E-16	50,902	38,622	1.32
iNat	Curator effort	2015 (b1)	0.54	0.09	5.94	2.86E-09	-	-	-
iNat	Curator effort	2016 (b2)	0.84	0.07	12.33	<2.00E-16	-	-	-
iNat	Curator effort	2017 (b3)	0.34	0.05	6.68	2.38E-11	-	-	-
iNat	Curator effort	2018 (b4)	0.08	0.03	2.22	0.03	-	-	-
iNat	Curator effort	2019 (b5)	-0.48	0.03	-18.26	<2.00E-16	-	-	-
GBD	Distance effort	2020 (b0)	0.26	0.04	6.55	5.90E-11	11,879	8,897	1.34
GBD	Distance effort	2015 (b1)	-1.15	0.22	-5.33	9.94E-08	-	-	-
GBD	Distance effort	2016 (b2)	-0.90	0.16	-5.62	1.89E-08	-	-	-
GBD	Distance effort	2017 (b3)	-0.90	0.08	-11.39	<2.00E-16	-	-	-
GBD	Distance effort	2018 (b4)	-0.78	0.06	-13.10	<2.00E-16	-	-	-
GBD	Distance effort	2019 (b5)	-0.72	0.05	-13.07	<2.00E-16	-	-	-
GBD	Sampling protocol	2020 (b0)	-0.16	0.03	-6.50	8.18E-11	18,392	15,912	1.16
GBD	Sampling protocol	2015 (b1)	2.35	0.27	8.61	<2.00E-16	-	-	-
GBD	Sampling protocol	2016 (b2)	1.40	0.14	9.90	<2.00E-16	-	-	-
GBD	Sampling protocol	2017 (b3)	1.19	0.06	19.28	<2.00E-16	-	-	-
GBD	Sampling protocol	2018 (b4)	1.50	0.05	30.06	<2.00E-16	-	-	-
GBD	Sampling protocol	2019 (b5)	1.68	0.05	35.44	<2.00E-16	-	-	-
GBD	Duration effort	2020 (b0)	-0.05	0.04	-1.33	0.18	11,685	8,897	1.31
GBD	Duration effort	2015 (b1)	-0.89	0.22	-4.07	4.66E-05	-	-	-
GBD	Duration effort	2016 (b2)	-0.77	0.17	-4.65	3.40E-06	-	-	-
GBD	Duration effort	2017 (b3)	-0.48	0.08	-6.21	5.24E-10	-	-	-
GBD	Duration effort	2018 (b4)	-0.57	0.06	-9.52	<2.00E-16	-	-	-
GBD	Duration effort	2019 (b5)	-0.66	0.06	-11.82	<2.00E-16	-	-	-
GBD	Group size	2020 (b0)	0.29	0.04	7.33	2.33E-13	8,214	8,890	0.92
GBD	Group size	2015 (b1)	-2.18	0.29	-7.54	4.54E-14	-	-	-
GBD	Group size	2016 (b2)	-2.39	0.24	-9.94	<2.00E-16	-	-	-
GBD	Group size	2017 (b3)	-1.95	0.10	-20.07	<2.00E-16	-	-	-
GBD	Group size	2018 (b4)	-2.32	0.08	-29.69	<2.00E-16	-	-	-
GBD	Group size	2019 (b5)	-2.33	0.07	-33.15	<2.00E-16	-	-	-

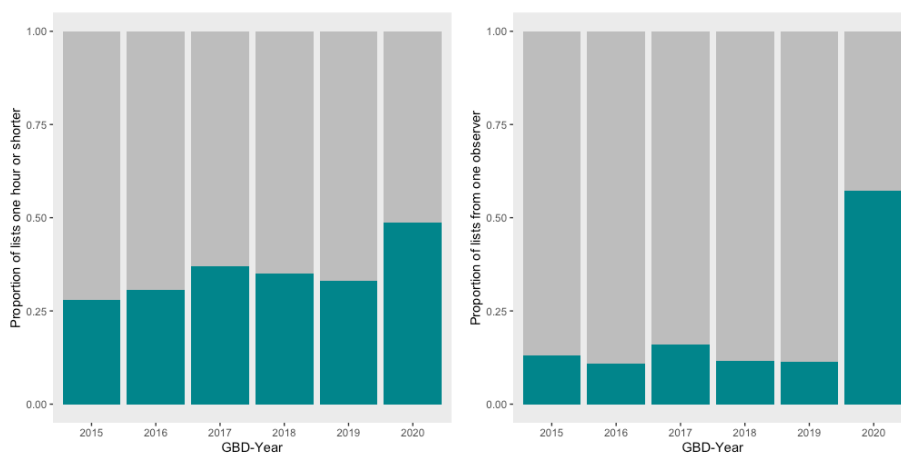


Figure S6. Yearly comparisons of effort in terms of duration (left) and observer group size (right) for eBird during our study period. For eBird-duration turquoise shows the proportion of checklists with effort less than or equal to one hour vs. checklists with efforts greater than one hour in grey. For eBird-group size turquoise shows the proportion of checklists done by a single observer vs. checklists done by more than one observer.

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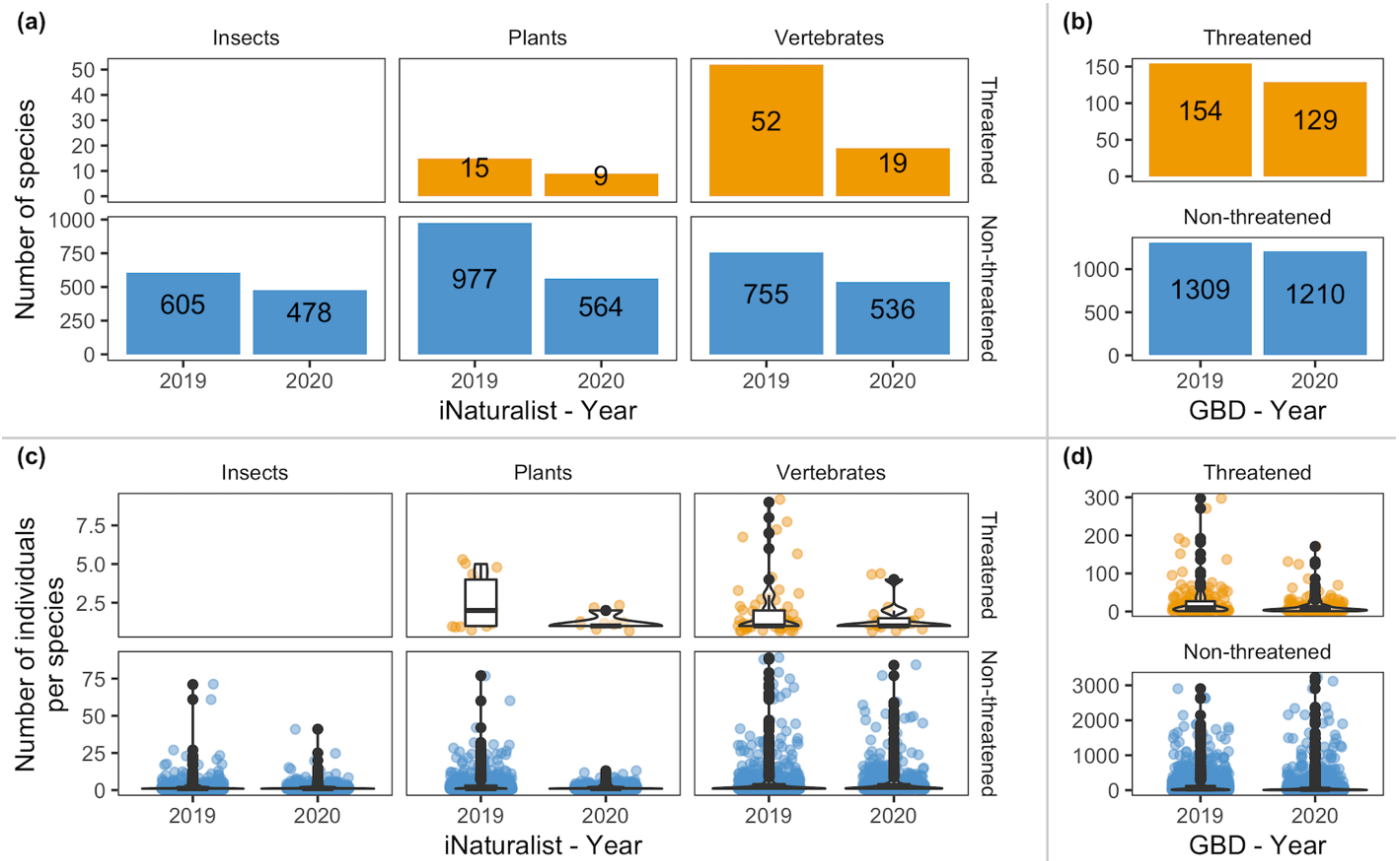


Figure S7. Number of species (a and b) and records (c and d) according to threat status (threatened: orange, non-threatened: blue) between 2019 and 2020 in the iNaturalist and eBird datasets. Despite being one of the most recorded taxa in iNaturalist, we had no sources to determine whether recorded insects were threatened.

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Table S4. Number of species and records or checklist for the total datasets, as well as for species of conservation priority.

Dataset	Group	Year	No. Species	Yearly change
iNat	All	2015	228	-
iNat	All	2016	414	82%
iNat	All	2017	592	43%
iNat	All	2018	1,145	93%
iNat	All	2019	1,956	71%
iNat	All	2020	1,292	-34%
iNat	Threatened	2015	11	-
iNat	Threatened	2016	24	118%
iNat	Threatened	2017	26	8%
iNat	Threatened	2018	69	165%
iNat	Threatened	2019	112	62%
iNat	Threatened	2020	27	-76%
iNat	Endemic	2015	16	-
iNat	Endemic	2016	27	69%
iNat	Endemic	2017	40	48%
iNat	Endemic	2018	114	185%
iNat	Endemic	2019	257	125%
iNat	Endemic	2020	109	-58%
GBD	All	2015	846	-
GBD	All	2016	948	12%
GBD	All	2017	1,483	56%
GBD	All	2018	1,542	4%
GBD	All	2019	1,584	3%
GBD	All	2020	1,435	-9%
GBD	Threatened	2015	63	-
GBD	Threatened	2016	67	6%
GBD	Threatened	2017	133	99%
GBD	Threatened	2018	140	5%
GBD	Threatened	2019	154	10%
GBD	Threatened	2020	129	-16%
GBD	Endemic	2015	30	-
GBD	Endemic	2016	26	-13%
GBD	Endemic	2017	49	88%
GBD	Endemic	2018	47	-4%
GBD	Endemic	2019	56	19%
GBD	Endemic	2020	47	-16%

Table S5. Statistical output for analysis of deviance between log-linear models comparing the additive and interactive effects of priority species group and year.

Dataset	Model	Res.DF	Res.Dev	DF	Deviance	Pr(>Chi)
iNat	Threat + Year	5	34.14	-	-	-
iNat	Threat * Year	0	0	5	34.14	2.23E-06
iNat	Endemism + Year	5	39.86	-	-	-
iNat	Endemism * Year	0	0	5	39.86	1.60E-07
GBD	Threat + Year	5	7.68	-	-	-
GBD	Threat * Year	0	0	5	7.68	0.18
GBD	Endemism + Year	5	1.67	-	-	-
GBD	Endemism * Year	0	0	5	1.67	0.89

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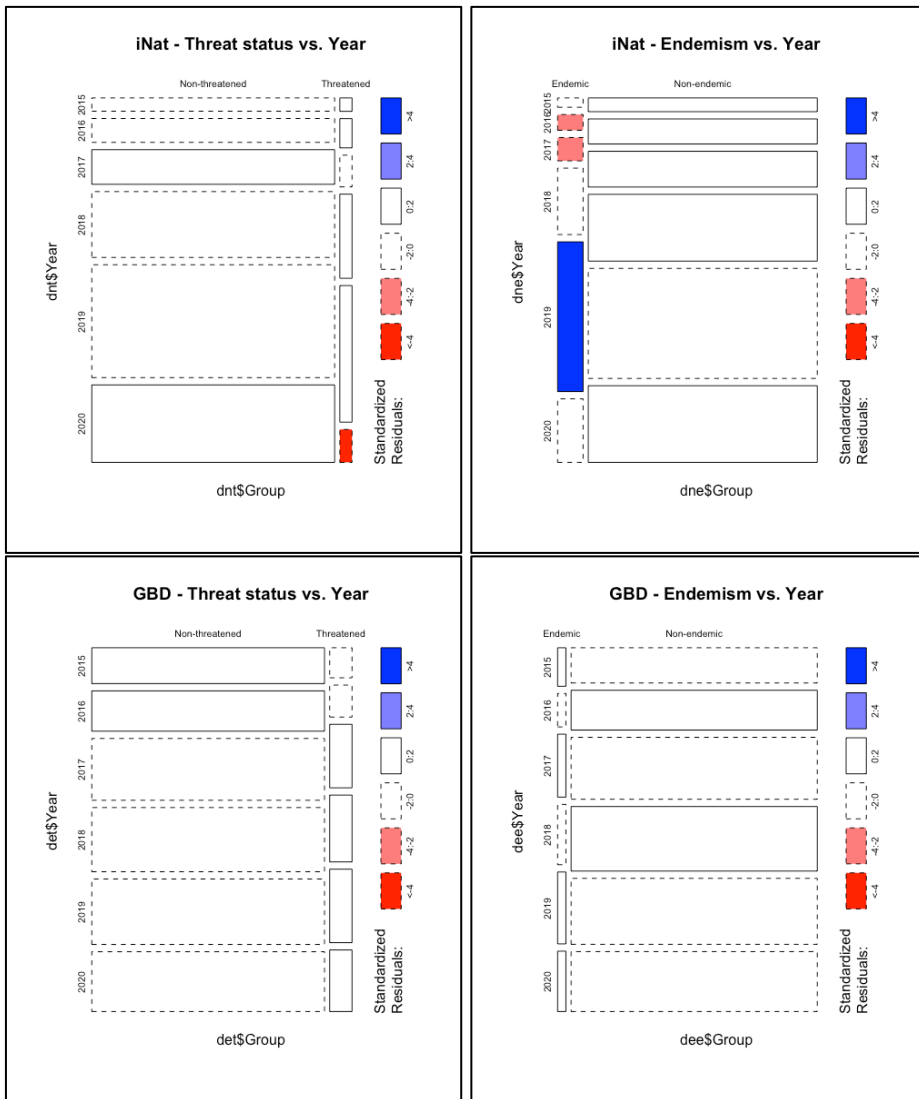


Figure S8. Mosaic plots for the interaction of threat status (left) and endemism (right) vs. year for species reported during March 25th - April 25th of 2015-2020 in iNaturalist (top) and during Global Big Days of 2015-2020 in eBird (bottom).