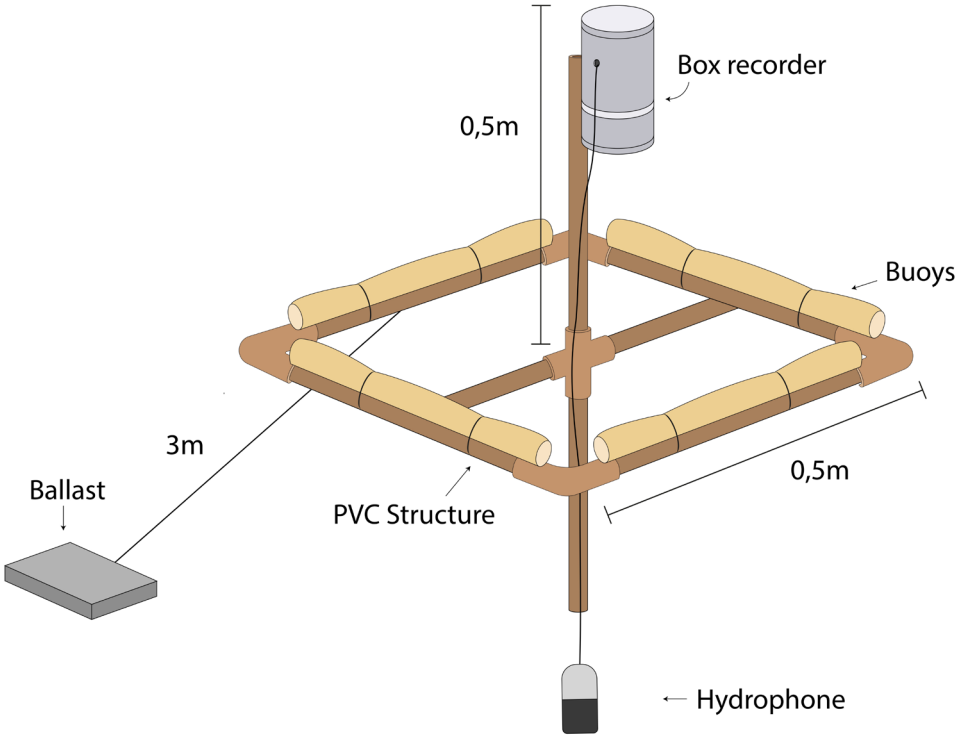

FIGURE S1 | Structure (sonobuoys) designed for the execution of passive acoustic monitoring sets.

TABLE S2 | Mean and standard deviations values of temperature (°C) and depth (m).

Mean ± Standard deviation (minimum – maximum)				
Tourism season	Tourism type	Exposure	Abiotic variables	
			Temperature	Depth
Peak	Year-round	Exposed	26.76 ± 0.87(25.89–27.63)	1.45 ± 0.21 (1.24–1.66)
		Sheltered	25.06 ± 0.83 (24.23–25.89)	1.35 ± 0.56 (0.79–1.91)
	Seasonal	Exposed	26.03 ± 1.10 (24.93–27.13)	1.41 ± 0.55 (0.86–1.96)
		Sheltered	26.74 ± 1.05 (25.69–27.79)	1.32 ± 0.83 (0.49–2.15)
Shoulder	Year-round	Exposed	27.41 ± 0.50 (26.91–27.91)	1.51 ± 0.23 (1.28–1.74)
		Sheltered	26.47 ± 0.65 (25.82–27.12)	1.57 ± 0.56 (1.01–2.13)
	Seasonal	Exposed	28.19 ± 0.43 (27.76–28.62)	1.13 ± 0.51 (0.62–1.64)
		Sheltered	27.89 ± 0.83 (27.06–28.72)	1.18 ± 0.60 (0.58–1.78)

TABLE S3 | Significance values (p-values) from Dunn's post hoc test following Kruskal-Wallis analysis for multiple comparisons between different fish sound types, based on the following sound parameters: sound duration, number of pulses, pulse period, peak frequency, lowest frequency, and highest frequency. p-values < 0.001, < 0.01, and ≤ 0.05 indicate statistically significant differences between fish sound types. "ns" denotes non-significant comparisons. The symbol "–" denotes comparisons that were not applicable for the respective variable.

Comparison	Sound duration	Number of pulses	Pulse period	Peak frequency	Lowest frequency	Highest frequency
Sound 1 - Sound 2	<0.001	<0.001	<0.001	<0.001	ns	<0.001
Sound 1 - Sound 3	<0.001	–	–	<0.01	ns	<0.001
Sound 1 - Sound 4	ns	<0.01	<0.001	<0.001	ns	<0.001
Sound 1 - Sound 5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sound 1 - Sound 6	<0.001	<0.01	<0.01	<0.001	ns	<0.001
Sound 1 - Sound 7	<0.001	–	–	<0.001	<0.01	<0.001
Sound 1 - Sound 8	<0.001	ns	<0.001	<0.01	<0.01	<0.001
Sound 1 - Sound 9	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Sound 2 - Sound 3	<0.001	–	–	<0.01	ns	<0.001
Sound 2 - Sound 4	<0.001	<0.001	<0.001	<0.001	ns	<0.001
Sound 2 - Sound 5	<0.001	<0.001	ns	<0.001	<0.001	<0.001
Sound 2 - Sound 6	<0.001	<0.01	<0.001	<0.01	ns	<0.001
Sound 2 - Sound 7	ns	–	–	ns	<0.01	<0.001
Sound 2 - Sound 8	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01
Sound 2 - Sound 9	<0.001	<0.001	<0.001	<0.01	<0.01	ns
Sound 3 - Sound 4	<0.001	–	–	<0.001	ns	<0.001
Sound 3 - Sound 5	<0.05	–	–	<0.001	<0.001	ns
Sound 3 - Sound 6	ns	–	–	<0.01	ns	ns
Sound 3 - Sound 7	<0.001	–	–	<0.01	<0.01	ns
Sound 3 - Sound 8	<0.05	–	–	ns	<0.01	<0.01
Sound 3 - Sound 9	<0.001	–	–	<0.01	<0.01	<0.001
Sound 4 - Sound 5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sound 4 - Sound 6	<0.001	<0.001	<0.001	<0.01	ns	<0.001
Sound 4 - Sound 7	<0.001	–	–	<0.001	<0.01	<0.001
Sound 4 - Sound 8	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Sound 4 - Sound 9	<0.001	ns	<0.001	<0.01	<0.01	<0.001
Sound 5 - Sound 6	<0.05	<0.001	<0.001	<0.001	<0.001	ns
Sound 5 - Sound 7	<0.001	–	–	<0.001	<0.001	ns
Sound 5 - Sound 8	<0.05	<0.001	<0.01	<0.001	<0.001	<0.01
Sound 5 - Sound 9	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001
Sound 6 - Sound 7	<0.001	–	–	<0.01	<0.01	ns
Sound 6 - Sound 8	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Sound 6 - Sound 9	<0.001	<0.001	<0.01	ns	<0.01	<0.001
Sound 7 - Sound 8	<0.01	–	–	<0.01	ns	<0.01
Sound 7 - Sound 9	<0.001	–	–	<0.01	ns	<0.001
Sound 8 - Sound 9	<0.05	<0.001	<0.01	<0.01	ns	<0.01

TABLE S4 | Mean ± standard deviation (minimum – maximum) of sound parameters for nine distinct types of sounds produced by fishes. The analyzed parameters include sound duration (ms), number of pulses, pulse period (ms), peak frequency (kHz), lowest frequency (kHz), and highest frequency (kHz). Superscript letters indicate statistically significant differences among sound types for each parameter, based on the Kruskal-Wallis test followed by Dunn's post hoc test. In the table, a dash (–) is shown for sound types 3 and 7, reflecting that these sounds consist of a single pulse, and therefore the parameters 'number of pulses' and 'pulse period' are not applicable. N represents the number of recordings of each sound type.

Mean ± Standard deviation (minimum – maximum)						
Sound Types	**Sound duration (ms)**	**Number of pulses**	**Pulse period (ms)**	**Peak frequency (kHz)**	**Lowest frequency (kHz)**	**Highest frequency (kHz)**
Sound 1 (N=301)	55.4 ± 8.1^{A} (45–58.1)	5.8 ± 1.8^{C} (5–8)	4.8 ± 1.1^{B} (4.3–5.5)	0.8 ± 0.1^{B} (0.8–1.2)	0.1 ± 0.0^{C} (0.1–0.2)	3.8 ± 0.3^{A} (3.2–4.1)
Sound 2 (N=42)	8.9 ± 1.2^{D} (6.3–10.1)	2.5 ± 0.5^{D} (2–3)	1.1 ± 0.2^{D} (1.0–1.4)	0.4 ± 0.3^{C} (0.3–0.5)	0.1 ± 0.1^{C} (0.1–0.3)	0.9 ± 0.2^{C} (0.8–1.0)
Sound 3 (N=449)	12.0 ± 2.3^{C} (7–15.8)	–	–	0.5 ± 0.1^{C} (0.3–0.6)	0.1 ± 0.0^{C} (0.1–0.1)	2.1 ± 0.1^{B} (2.0–2.3)
Sound 4 (N=86)	62.1 ± 18.5^{A} (32.1–84.2)	9.6 ± 2.9^{B} (4–13)	6.2 ± 0.3^{A} (5.6–6.8)	0.2 ± 0.0^{D} (0.2–0.2)	0.1 ± 0.0^{C} (0.1–0.1)	0.4 ± 0.0^{D} (0.4–0.5)
Sound 5 (N=516)	18.7 ± 2.3^{BC} (13.2–21.8)	25.3 ± 3.1^{A} (21–31)	0.7 ± 0.1^{D} (0.5–0.8)	1.5 ± 0.2^{A} (1.3–1.7)	0.9 ± 0.1^{A} (0.7–1.1)	2.0 ± 0.1^{B} (1.9–2.2)
Sound 6 (N=131)	15.3 ± 1.2^{C} (12.7–16.7)	4.1 ± 0.8^{CD} (3–5)	3.9 ± 0.1^{B} (3.6–4.1)	0.3 ± 0.1^{DC} (0.3–0.3)	0.1 ± 0.0^{C} (0.1–0.1)	1.9 ± 0.1^{B} (1.7–1.9)
Sound 7 (N=319)	8.0 ± 0.6^{D} (6.8–8.9)	–	–	0.4 ± 0.1^{C} (0.3–0.5)	0.2 ± 0.1^{BC} (0.2–0.2)	2.0 ± 0.1^{B} (2.0–2.1)
Sound 8 (N=560)	10.2 ± 1.4^{BCD} (8.1–21.8)	6.9 ± 2.2^{C} (5–8)	1.7 ± 0.3^{CD} (0.5–2.2)	0.6 ± 0.1^{BC} (0.4–0.8)	0.2 ± 0.1^{BC} (0.1–0.2)	1.5 ± 0.1^{BC} (1.2–1.9)
Sound 9 (N=241)	27.9 ± 1.0^{B} (16.8–32.5)	10.5 ± 2.3^{B} (7–14)	2.2 ± 0.2^{C} (1.9–2.5)	0.3 ± 0.1^{DC} (0.2–0.4)	0.2 ± 0.0^{BC} (0.1–0.2)	0.9 ± 0.1^{C} (0.8–1.1)

TABLE S5 | Results of pairwise PERMANOVA comparisons among fish sound types based on four sound parameters: sound duration, peak frequency, lowest frequency, and highest frequency. The column "Comparison" indicates the pairs of sound types being compared. "SumsOfSqs" represents the sum of squares, which reflects the total variance between the two groups. "F.Model" is the F-statistic, showing the ratio of between-group to within-group variation. "R^2" indicates the proportion of variance explained by the differences between sound types. The "p-value" column shows the significance level of each comparison.

Comparison	SumsOfSqs	F.Model	R^2	p-value
Sound 1 - Sound 2	168.15	179.46	0.73	0.001
Sound 1 - Sound 3	2078.02	724.89	0.42	0.001
Sound 1 - Sound 4	202980.88	4437.67	0.87	0.001
Sound 1 - Sound 5	28952.15	7269.47	0.81	0.001
Sound 1 - Sound 6	3523.68	3618.6	0.84	0.001
Sound 1 - Sound 7	2105.21	3300.19	0.75	0.001
Sound 1 - Sound 8	2322.5	2927.23	0.65	0.001
Sound 1 - Sound 9	79232.31	9953.91	0.91	0.001
Sound 2 - Sound 3	376.87	75.15	0.13	0.001

TABLE S5 | (Continued)

Comparison	SumsOfSqs	F.Model	R^2	p-value
Sound 2 - Sound 4	79961.99	347.15	0.73	0.001
Sound 2 - Sound 5	3899.42	723.25	0.38	0.001
Sound 2 - Sound 6	1312.19	948.9	0.85	0.001
Sound 2 - Sound 7	45.49	100.69	0.15	0.001
Sound 2 - Sound 8	90.43	117.32	0.10	0.001
Sound 2 - Sound 9	13623.68	871.7	0.64	0.001
Sound 3 - Sound 4	181258.38	3081.98	0.85	0.001
Sound 3 - Sound 5	14666.48	2678.9	0.63	0.001
Sound 3 - Sound 6	1099.41	248.13	0.30	0.001
Sound 3 - Sound 7	4037.87	1513.55	0.61	0.001
Sound 3 - Sound 8	1227.97	568.38	0.28	0.001
Sound 3 - Sound 9	55013.84	4963.63	0.85	0.001
Sound 4 - Sound 5	151118.81	5162.45	0.81	0.001
Sound 4 - Sound 6	113839.58	840.18	0.80	0.001
Sound 4 - Sound 7	216408.59	4477.08	0.88	0.001
Sound 4 - Sound 8	214116.8	7815.87	0.88	0.001
Sound 4 - Sound 9	85204.38	1228.5	0.70	0.001
Sound 5 - Sound 6	1578.43	309.89	0.20	0.001
Sound 5 - Sound 7	40638.2	10438.53	0.86	0.001
Sound 5 - Sound 8	39293.71	12027.29	0.85	0.001
Sound 5 - Sound 9	26731.65	3051.43	0.66	0.001
Sound 6 - Sound 7	5686.98	10199.74	0.94	0.001
Sound 6 - Sound 8	3139.12	3892.81	0.78	0.001
Sound 6 - Sound 9	15628.7	1168.12	0.67	0.001
Sound 7 - Sound 8	1750.9	2866.78	0.65	0.001
Sound 7 - Sound 9	93152.52	11677.08	0.92	0.001
Sound 8 - Sound 9	94713.7	16638.46	0.92	0.001

TABLE S6 | Means ± standard deviations (minimum – maximum) of sound parameters for fish sounds recorded in exposed and sheltered sites. The parameters include sound duration (ms), number of pulses, pulse period (ms), peak frequency (kHz), lowest frequency (kHz), and highest frequency (kHz). Each sound type is presented separately for each environment. Missing data (–) indicate that the parameter was not measured or was not applicable for that sound type in the given environment. N represents the number of recordings of each sound type.

Mean ± Standard deviation (minimum – maximum)							
Exposure	**Sounds**	**Sound duration (ms)**	**Number of pulses**	**Pulse period (ms)**	**Peak frequency (kHz)**	**Lowest frequency (kHz)**	**Highest frequency (kHz)**
Exposed	Sound 1 (N=230)	54.8 ± 7.9 (45–58.1)	6.0 ± 1.6 (5–8)	4.7 ± 1.0 (4.3–5.5)	0.9 ± 0.2 (0.8–1.2)	0.1 ± 0.0 (0.1–0.2)	3.6 ± 0.3 (3.2–4.1)
Sheltered	Sound 1 (N=71)	56.1 ± 7.5 (45–57.9)	5.9 ± 1.7 (5–8)	4.8 ± 1 (4.5–5.5)	0.8 ± 0.2 (0.8–1.2)	0.1 ± 0.0 (0.1–0.2)	3.7 ± 0.3 (3.2–4.1)
Exposed	Sound 2 (N=4)	9.1 ± 0.9 (6.3–10.1)	2.5 ± 0.6 (2.0–3.0)	1.4 ± 0.3 (1.0–1.4)	0.4 ± 0.2 (0.3–0.5)	0.1 ± 0.2 (0.1–0.3)	0.8 ± 0.3 (0.8–1.0)
Sheltered	Sound 2 (N=38)	9.2 ± 1.3 (6.3–10.1)	2.6 ± 0.4 (2.0–3.0)	0.9 ± 0.1 (1.0–1.4)	0.4 ± 0.2 (0.3–0.5)	0.3 ± 0.1 (0.1–0.3)	1.0 ± 0.3 (0.8–1.0)
Exposed	Sound 5 (N=117)	18.3 ± 2.5 (13.2–21.8)	29.7 ± 3.2 (21–31)	0.7 ± 0.1 (0.5–0.8)	1.5 ± 0.1 (1.3–1.7)	0.8 ± 0.1 (0.7–1.1)	2 ± 0.1 (1.9–2.2)
Sheltered	Sound 5 (N=399)	18.8 ± 2.3 (13.3–21.8)	26.2 ± 3.1 (21–31)	0.7 ± 0.1 (0.5–0.8)	1.5 ± 0.2 (1.3–1.7)	0.9 ± 0.1 (0.7–1.1)	2 ± 0.1 (1.9–2.2)
Exposed	Sound 7 (N=42)	8.3 ± 0.4 (7–8.9)	–	–	0.4 ± 0.2 (0.4–0.5)	0.5 ± 0.1 (0.2–0.2)	1.9 ± 0.1 (2.0–2.1)
Sheltered	Sound 7 (N=297)	8.6 ± 0.3 (6.8–8.9)	–	–	0.4 ± 0.4 (0.3–0.5)	0.2 ± 0.1 (0.2–0.2)	2 ± 0.1 (2.0–2.1)
Exposed	Sound 8 (N=100)	10.2 ± 1.1 (8.1–21.8)	7.2 ± 2.3 (5.0–8.0)	1.4 ± 0.1 (0.5–2.2)	0.2 ± 0.1 (0.4–0.8)	0.2 ± 0.1 (0.1–0.2)	1.1 ± 0.1 (1.2–1.9)
Sheltered	Sound 8 (N=460)	10.5 ± 1.5 (8.1–21.8)	7.3 ± 2.4 (5.0–8.0)	2.0 ± 0.1 (0.5–2.2)	0.6 ± 0.1 (0.4–0.8)	0.1 ± 0.3 (0.1–0.2)	1.8 ± 0.2 (1.2–1.9)
Exposed	Sound 9 (N=44)	24.6 ± 0.9 (16.8–32.5)	12.3 ± 2.4 (7.0–14.0)	2.2 ± 0.1 (1.9–2.5)	0.8 ± 0.2 (0.2–0.4)	0.2 ± 0.1 (0.1–0.2)	1 ± 0.3 (0.8–1.1)
Sheltered	Sound 9 (N=197)	29.2 ± 0.8 (16.8–32.5)	9.6 ± 1.5 (7.0–14.0)	2.1 ± 0.2 (1.9–2.5)	0.7 ± 0.4 (0.2–0.4)	0.2 ± 0.1 (0.1–0.2)	0.9 ± 0.2 (0.8–1.1)

TABLE S7 | Number of individuals recorded per species across all sampling sites. For each species, the level of evidence for sound production is indicated (*i.e.*, whether sound production has been directly documented for the species or inferred from closely related taxa). Asterisk denote species with documented sound production or species belonging to genera or families that include known sound-producing members (inference based on phylogenetic relatedness). References indicate the sources supporting the documented or inferred sound production.

Sample sites						
Species	**Year-round exposed**	**Year-round sheltered**	**Seasonal exposed**	**Seasonal sheltered**	**Sound production evidence**	**References**
*Abudefduf saxatilis**	1017	53	41	44	Species	Fish, Mowbray (1970)
*Acanthurus bahianus**	17	50	26	24	Species	Fish, Mowbray (1970)
*Acanthurus coeruleus**	12	7	7	10	Species	Fish, Mowbray (1970)
*Anisotremus virginicus**	0	0	0	4	Species	Fish, Mowbray (1970)
Atherinella brasiliensis	2	0	0	0	–	–
*Chaetodon striatus**	1	1	7	6	Species	Fish, Mowbray (1970)
Coryphopterus glaucofraenum	6	0	0	7	–	–
*Epinephelus adscensionis**	1	2	2	0	Species	Fish, Mowbray (1970)

TABLE S7 | (Continued)

Sample sites						
Species	**Year-round exposed**	**Year-round sheltered**	**Seasonal exposed**	**Seasonal sheltered**	**Sound production evidence**	**References**
Eucinostomus spp.*	21	0	0	0	Genus	Green (1971)
*Haemulon aurolineatum**	49	72	0	0	Species	Fish, Mowbray (1970)
*Haemulon parra**	41	0	5	5	Species	Fish, Mowbray (1970)
*Haemulon plumierii**	0	7	0	2	Species	Fish, Mowbray (1970)
*Haemulon squamipinna**	1	26	0	0	Species	Fish, Mowbray (1970)
*Halichoeres brasiliensis**	0	1	2	4	Genus	Fish, Mowbray (1970)
*Halichoeres poeyi**	0	27	11	5	Genus	Fish, Mowbray (1970)
*Holocentrus adscensionis**	24	23	15	14	Species	Fish, Mowbray (1970)
*Kyphosus vaigiensis**	1	0	0	0	Genus	Fish, Mowbray (1970)
Labrisomus nuchipinnis	1	0	2	1	–	–
*Lutjanus alexandrei**	9	0	1	0	Species	Fish, Mowbray (1970)
*Lutjanus analis**	0	0	0	3	Species	Fish, Mowbray (1970)
*Mugil Curema**	1	0	0	0	Species	Fish, Mowbray (1970)
Mulloidichthys martinicus	0	0	6	1	–	–
*Myripristis jacobus**	12	8	9	7	Species	Fish, Mowbray (1970)
*Oligoplites saliens**	0	3	0	0	Genus	Fish, Mowbray (1970)
*Paranisotremus moricandi**	0	1	0	1	Subfamily: Haemulinae	Fish, Mowbray (1970)
*Pempheris schomburgkii**	1	0	0	0	Species	Bertucci *et al.* (2021)
*Pomacanthus paru**	4	0	0	0	Species	Fish, Mowbray (1970)
*Pseudupeneus maculatus**	0	7	2	0	Species	Fish, Mowbray (1970)
*Scarus trispinosus**	0	0	1	0	Genus	Fish, Mowbray (1970)
*Scarus zenlidae**	0	1	11	0	Genus	Fish, Mowbray (1970)
*Sparisoma axillare**	50	45	57	25	Genus	Fish, Mowbray (1970)
*Sparisoma frondosum**	0	0	1	1	Genus	Fish, Mowbray (1970)
*Sphoeroides testudineus**	11	0	0	0	Species	Fish, Mowbray (1970)
*Stegastes fuscus**	74	50	68	97	Species	Dobrin (1947)
*Stegastes variabilis**	14	2	5	8	Species	Tavolga *et al.* (2012)
Synodus intermedius	0	0	1	0	–	–
Total spp.	23	18	20	19	–	–
Total spp.*	21	18	18	17	–	–
Total ind.	1370	386	281	270	–	–
Total Ind.*	1368	386	278	262	–	–

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