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|  | Survey Type | |  | Individual Chi-Square Test | |
| Species | Roving | SVC | Total | X2 | p-value |
| Goldentail moray | 0 (0%) | 7 (100%) | 7 (100%) | 5.322 | **0.02106** |
| Green moray | 1 (5%) | 19 (95%) | 20 (100%) | 15.987 | **6.377e-05** |
| Purplemouth moray | 0 (0%) | 12 (100%) | 12 (100%) | 10.701 | **0.001071** |
| Spotted moray | 5 (8.77%) | 52 (91.23%) | 57 (100%) | 51.136 | **8.618e-13** |
| Sharptail eel | 0 (0%) | 2 (100%) | 2 (100%) | 0.50485 | 0.4774 |
| Amberjack | 0 (0%) | 1 (100%) | 1 (100%) | 0 | 1 |
| Black grouper | 11 (22.45%) | 38 (77.55%) | 49 (100%) | 18.047 | **2.155e-05** |
| Coney | 5 (29.41%) | 12 (70.59%) | 17 (100%) | 2.3061 | 0.1289 |
| Gag grouper | 4 (15.38%) | 22 (84.62%) | 26 (100%) | 12.703 | **0.000365** |
| Graysby | 51 (45.54%) | 61 (54.46%) | 112 (100%) | 1.567 | 0.2106 |
| Nassau grouper | 0 (0%) | 20 (100%) | 20 (100%) | 19.97 | **7.866e-06** |
| Red grouper | 11 (25%) | 33 (75%) | 44 (100%) | 12.712 | **0.0003634** |
| Red hind | 0 (0%) | 7 (100%) | 7 (100%) | 5.322 | **0.02106** |
| Rock hind | 1 (20%) | 4 (80%) | 5 (100%) | 0.8197 | 0.3653 |
| Greater soapfish | 0 (0%) | 6 (100%) | 6 (100%) | 4.2904 | **0.03833** |
| Scamp | 0 (0%) | 1 (100%) | 1 (100%) | 0 | 1 |
| Black margate | 2 (66.67%) | 1 (33.33%) | 3 (100%) | 0 | 1 |
| Cubera snapper | 0 (0%) | 1 (100%) | 1 (100%) | 0 | 1 |
| Mutton snapper | 15 (41.67%) | 21 (58.33%) | 36 (100%) | 0.83979 | 0.3595 |
| Barracuda | 6 (50%) | 6 (50%) | 12 (100%) | 0 | 1 |
| Lionfish | 5 (12.5%) | 35 (87.5%) | 40 (100%) | 26.031 | **3.36e-07** |
| Spotted scorpionfish | 1 (11.11%) | 8 (88.89%) | 9 (100%) | 4.1809 | **0.04088** |
| Trumpetfish | 26 (96.30%) | 1 (3.70%) | 27 (100%) | 24.516 | **7.371e-07** |
| Total | 144 (29.75%) | 340 (70.25%) | 484 (100%) |  |  |
| **X2 = 136.47, df = 22, p < 2.2e-16** | | | | | |

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| **Predictor** | **Survey Type** | |  |
| **Aggregation Behaviour** | **SVC** | **Transect** | **Total** |
| Schooling | 107 (48.86%) | 112 (51.14%) | 219 (32.49%) |
| Shoaling | 114 (50%) | 114 (50%) | 228 (33.83%) |
| Solitary | 113 (49.78%) | 114 (50.22%) | 227 (33.68%) |
| Total | 334 (49.55%) | 340 (50.45%) | 674 (100%) |
| Chi-Square Test | X-squared = 0.065153, df = 2, p-value = 0.9679 | | |
| **Cryptic Behaviour** | **SVC** | **Transect** | **Total** |
| Absence | 114 (50%) | 114 (50%) | 228 (50.11%) |
| Presence | 113 (49.78%) | 114 (50.22%) | 227 (49.89%) |
| Total | 227 (49.89%) | 228 (50.11%) | 455(100%) |
| Chi-Square Test | X-squared = 0, df = 1, p-value = 1 | | |
| **Colouration** | **SVC** | **Transect** | **Total** |
| Camouflage | 65 (36.72%) | 112 (63.28%) | 177 (21.35%) |
| Neutral | 111 (49.33%) | 114 (50.67%) | 225 (27.14%) |
| Silvering | 104 (51.74%) | 97 (48.26%) | 201 (24.25%) |
| Colourful | 114 (50.44%) | 112 (49.56%) | 226 (27.26%) |
| Total | 394 (47.53%) | 435 (52.47%) | 829 (100%) |
| Chi-Square Test | **X-squared = 10.567, df = 3, p-value = 0.01431** | | |
| **Shape** | **SVC** | **Transect** | **Total** |
| Elongated | 94 (45.19%) | 114 (54.81%) | 208 (24.82%) |
| Fusiform | 114 (50%) | 114 (50%) | 228 (27.21%) |
| Compressiform | 114 (50%) | 114 (50%) | 228 (27.21%) |
| Globiform | 70 (40.23%) | 104 (59.77%) | 174 (20.76%) |
| Total | 392 (46.78%) | 446 (53.22%) | 838 (100%) |
| Chi-Square Test | X-squared = 5.1083, df = 3, p-value = 0.164 | | |
| **Colouration** | **SVC** | **Roving** | **Total** |
| Camouflage | 6 (9.52%) | 57 (90.48%) | 63 (23.42%) |
| Neutral | 63 (38.41%) | 101 (61.59%) | 164 (60.97%) |
| Silvering | 15 (35.71%) | 27 (64.29%) | 42 (15.61%) |
| Total | 84 (31.23%) | 185 (68.77%) | 269 (100%) |
| Chi-Square Test | **X-squared = 18.157, df = 2, p-value = 0.0001141** | | |

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| **Predictor** | **Estimate** | **Adjusted SE** | **Z Value** | **P-Value** |
| aggregation behavior: shoaling | 0.124 | 0.0100 | 1.245 | **< 0.001** |
| aggregation behavior: solitary | 0.414 | 0.122 | 3.385 | **< 0.001** |
| coloration: colorful | 0.941 | 0.169 | 5.567 | **< 0.001** |
| coloration: neutral | 0.780 | 0.152 | 5.126 | **< 0.001** |
| coloration: silvering | 0.976 | 0.301 | 3.243 | **0.00118** |
| cryptic behavior | -0.308 | 0.0627 | 4.906 | **< 0.001** |
| water column position: demersal | -0.115 | 0.248 | 0.462 | 0.644 |
| size bin | 0.0103 | 0.00617 | 1.677 | 0.0936 |
| shape: elongated | -1.858 | 0.166 | 11.210 | **< 0.001** |
| shape: fusiform | -0.337 | 0.159 | 2.113 | **0.0346** |
| shape: globiform | -1.485 | 0.248 | 5.995 | **< 0.001** |
| nocturnal behavior | 0.120 | 0.117 | 1.029 | 0.304 |
| maximum length | 0.00637 | 0.00167 | 3.808 | **< 0.001** |
| reef type: patch | -0.695 | 0.105 | 6.642 | **< 0.001** |
| percent octocoral | 0.00979 | 0.00157 | 6.255 | **< 0.001** |
| percent stony coral | 0.0156 | 0.00342 | 4.570 | **< 0.001** |
| elongated:size bin | 0.0843 | 0.0127 | 6.617 | **< 0.001** |
| fusiform:size bin | 0.0189 | 0.00588 | 3.207 | **0.00134** |
| globiform:size bin | 0.0634 | 0.0171 | 3.715 | **< 0.001** |

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| **Predictor** | **Estimate** | **Adjusted SE** | **Z Value** | **P-Value** |
| coloration: neutral | 0.295 | 0.1245 | 2.367 | **0.0179** |
| coloration: silvering | 1.132 | 0.259 | 4.365 | **< 0.001** |
| cryptic behavior | -0.0864 | 0.327 | 0.264 | 0.792 |

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| **Survey Method** | **Description** | **Developers** | **Designed For** | **Species Recorded** |
| Stationary Visual Census (SVC) | Stationary diver hovers off the reef; rotates in a circle of a specified radius and scans to specified height above reef; records fish species list for 5 mins, then completes one revolution per species recording abundance, minimum, maximum, and mean TL. | Bohnsack and Bannerot 1986 | Commercially harvested fish species | All |
| Belt Transect | Diver lays horizontal transect along reef; swims along it twice scanning fixed width on either side; records individuals >15cm TL on first pass; searches benthos along transect for cryptic/small-bodied fish <15cm TL on second pass; records species and individual TL. | Brock 1954 | All fish species | All |
| Roving Transect | Diver lays horizontal transect along reef; swims in serpentine pattern down each side; searches benthos and under crevices for cryptic individuals; records individuals and lengths. | Green et al. 2012 | Predatory fish species | Predators >15cm total length |

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| **Fish Traits** | | | |
| **Trait** | **Levels** | **Definition** | **Hypothesis** |
| Nocturnal | Categorical:  1 = nocturnal, 0 = not nocturnal | Whether the species is active exclusively at night or not. | Nocturnal species will be observed at lower densities on SVC surveys. |
| Position | Categorical: Demersal or benthic | Where the species is located in the water column. | Benthic species will be observed at lower densities on SVC surveys. |
| Aggregation | Categorical: Solitary, Shoaling, or Schooling | Level of aggregation. | Schooling species will be observed at greatest densities and solitary species will be observed at the lowest densities on SVC surveys. |
| Crypsis | Categorical:  1 = cryptic behavior present, 0 = cryptic behavior absent | Whether the species displays cryptic behavior (seeking refuge) or not. | Species displaying cryptic behavior will be observed at lower densities on SVC surveys. |
| Coloration | Categorical: Cryptic, Conspicuous, None | Whether the species is cryptically or conspicuously colored, or neither. | Cryptic species will be observed at the lowest densities and conspicuous species will be observed at the highest densities on SVC surveys. |
| Shape | Categorical: Anguilliform, Elongated, Fusiform, Compressiform, Globiform | The body shape of the species. | Fusiform species will be observed at the highest densities on SVC surveys as this method was designed to detect them, and globiform species will be observed at higher densities on SVC surveys due to their greater visibility. |
| Max. Length | Continuous (cm) | The maximum length that the species can reach. | Species with greater maximum lengths will be observed at greater densities on SVC surveys. |
| Size Bin | Categorical:  1 = 3.63cm, 2 = 7.53cm, 3 = 12.91cm, 4 = 17.94cm, 5 = 24.93cm, 6 = 47.70cm | Mean of the individual lengths in each size bin: 0-5cm, 5-10cm, 10-15cm, 5-20cm, 20-30cm, >30cm | Larger size bins will be observed at greater densities on SVC surveys. |
| Size Bin\* Shape | Categorical: each body shape and size bin level paired | The interaction between size bin and body shape. | As body size increases there will be a smaller difference in densities recorded between survey types. |
| **Habitat Traits** | | | |
| **Trait** | **Levels** | **Definition** | **Hypothesis** |
| Reef Type | Categorical:  Patch (isolated), Continuous | Type of reef at the survey site. | Continuous reefs will have smaller density differences between surveying techniques due to their higher visibility compared to patch reefs. |
| Octocoral | Continuous (%) | Percentage of reef covered in octocorals | As octocoral increases, we expect lower densities observed on SVC surveys due to visual impairment. |
| Stony Coral | Continuous (%) | Percentage nocof reef covered in stony coral. | As stony coral increases, we expect lower densities observed on SVC surveys due to increased structural complexity |
| Vertical Relief | Continuous (cm) | Vertical complexity of site (high value indicates high complexity). | High vertical relief will be associated with lower densities observed on SVC surveys. |
| Depth | Continuous (ft) | Average depth that surveys were conducted at. | Density differences will be smaller between SVC and other surveying methods at depth due to overall reduction of light and decreased bottom time. |

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| **Parameters in top ranked models** | **df** | **AICc** | **ΔAICc** | **Weight** |
| SVC vs. Transect Survey Model | | | | |
| 1.   **Aggregation** + **Coloration** + **Crypsis** + **Max. Length** + **Reef Type** + **Octocoral** + **Stony Coral** + **Shape**\*Size Bin | 21 | 33308.7 | 0.00 | 0.319 |
| 2.   **Aggregation** + **Coloration** + **Crypsis** + **Reef Type** + **Octocoral** + **Stony Coral** + **Shape**\*Size Bin | 20 | 33309.9 | 1.22 | 0.174 |
| 3.   **Coloration** + **Crypsis** + **Max. Length** + **Reef Type** + **Octocoral** + **Stony Coral** + **Shape**\*Size Bin | 19 | 33310.9 | 2.20 | 0.106 |
| 4.   **Aggregation** + **Coloration** + **Crypsis** + **Max. Length** + Position + **Reef Type** + **Octocoral** + **Stony Coral** + **Shape**\*Size Bin | 22 | 33311.5 | 2.75 | 0.081 |
| 5.   **Aggregation** + **Coloration** + **Crypsis** + **Max. Length** + Nocturnal + **Reef Type** + **Octocoral** + **Stony Coral** + **Shape**\*Size Bin | 22 | 33312.1 | 3.41 | 0.058 |
| 6.   **Aggregation** + **Coloration** + **Crypsis** + Position + **Reef Type** + **Octocoral** + **Stony Coral** + **Shape**\*Size Bin | 21 | 33312.7 | 3.97 | 0.044 |
| SVC vs. Roving Survey Model | | | | |
| 1.    **Coloration** | 6 | 1730.1 | 0.00 | 0.578 |
| 2.    **Coloration** + Crypsis | 7 | 1732.5 | 2.38 | 0.176 |

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| **Management focus** | **Functional trait groups** | **Morphological and behavioural trait groups** | **Example families (Florida, USA)** | **Recommended survey type** |
| fisheries status | predators | large, fusiform, silver, pelagic, schooling | Lutjanidae, Carangidae | SVC |
| large, fusiform, cryptic, demersal, solitary | Serranidae, Sciaenidae | Roving |
| coral health | herbivores | large, compressiform or fusiform, colorful, schooling | Scaridae, Acanthuridae | SVC |
|  | small, compressiform, colorful, solitary | Pomacentridae | Transect |
| corallivores | small, compressiform or fusiform, colorful, solitary or shoaling | Chaetodontidae, Scaridae | Transect |
| multiple (coral obligates) | small, compressiform, colorful, solitary | Chaetodontidae | Transect |
| small, elongated, solitary, cryptic | Gobiidae, Blenniidae | Transect |
| invasion impacts\* | multiple | small, cryptic, demersal, benthic, solitary, fusiform, elongated, nocturnal | Gobiidae, Blenniidae, Apogonidae, Scaridae (juveniles), Serranidae (juveniles) | Roving (for invasive lionfish), transect (for impacted native species) |

\**Impacts of an invasive reef predator (such as lionfish) used as an example*