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|----------|--|
| Croppers | <p><i>Acanthurus auranticavus</i>, <i>Acanthurus blochii</i>, <b><i>Acanthurus dussumieri</i></b>, <i>Acanthurus leucocheilus</i>, <i>Acanthurus leucosternon</i>, <i>Acanthurus lineatus</i>, <i>Acanthurus nigricans</i>, <i>Acanthurus nigricauda</i>, <b><i>Acanthurus nigrofuscus</i></b>, <i>Acanthurus nigroris</i>, <b><i>Acanthurus olivaceus</i></b>, <i>Acanthurus tennentii</i>, <i>Acanthurus tennentii</i>, <i>Acanthurus triostegus</i>, <i>Acanthurus tristis</i>, <i>Centropyge bicolor</i>, <i>Centropyge bispinosa</i>, <i>Centropyge vrolikii</i>, <i>Chrysiptera biocellata</i>, <i>Ctenochaetus binotatus</i>, <b><i>Ctenochaetus striatus</i></b>, <i>Ctenochaetus truncatus</i>, <i>Dischistodus melanotus</i>, <i>Dischistodus perspicillatus</i>, <i>Dischistodus prosopotaenia</i>, <i>Dischistodus pseudochrysopoecilus</i>, <b><i>Melichthys niger</i></b>, <i>Plectroglyphidodon lacrymatus</i>, <i>Plectroglyphidodon leucozonus</i>, <i>Plectroglyphidodon phoenixensis</i>, <i>Pomacentrus amboinensis</i>, <i>Pomacentrus bankanensis</i>, <i>Pomacentrus indicus</i>, <i>Pomacentrus nagasakiensis</i>, <i>Pomacentrus trilineatus</i>, <i>Pomacentrus wardi</i>, <b><i>Siganus corallinus</i></b>, <b><i>Siganus doliatus</i></b>, <i>Siganus puelloides</i>, <i>Siganus puellus</i>, <i>Siganus punctatus</i>, <i>Siganus spinus</i>, <i>Siganus stellatus</i>, <i>Siganus vulpinus</i>, <i>Stegastes apicalis</i>, <i>Stegastes fasciolatus</i>, <i>Stegastes lividus</i>, <i>Stegastes nigricans</i>, <i>Zebrasoma desjardinii</i>, <b><i>Zebrasoma scopas</i></b>, <b><i>Zebrasoma veliferum</i></b></p> |
| Scrapers | <p><b><i>Cetoscarus bicolor</i></b>, <i>Chlorurus atrilunula</i>, <b><i>Chlorurus bleekeri</i></b>, <i>Chlorurus capistratoides</i>, <i>Chlorurus enneacanthus</i>, <b><i>Chlorurus microrhinos</i></b>, <i>Chlorurus sordidus</i>, <i>Chlorurus stronglycephalus</i>, <b><i>Hipposcarus harid</i></b>, <b><i>Hipposcarus longiceps</i></b>, <b><i>Scarus altipinnis</i></b>, <i>Scarus capistratoides</i>, <i>Scarus caudofasciatus</i>, <b><i>Scarus chameleon</i></b>, <b><i>Scarus dimidiatus</i></b>, <i>Scarus falcipinnis</i>, <b><i>Scarus flavipectoralis</i></b>, <b><i>Scarus forsteni</i></b>, <b><i>Scarus frenatus</i></b>, <b><i>Scarus ghobban</i></b>, <b><i>Scarus globiceps</i></b>, <b><i>Scarus niger</i></b>, <b><i>Scarus oviceps</i></b>, <i>Scarus prasiognathos</i>, <b><i>Scarus psittacus</i></b>, <b><i>Scarus rivulatus</i></b>, <b><i>Scarus rubroviolaceus</i></b>, <b><i>Scarus scaber</i></b>, <b><i>Scarus schlegeli</i></b>, <i>Scarus spinus</i>, <b><i>Scarus tricolor</i></b>, <b><i>Scarus viridifucatus</i></b></p>   |

**Table S1** | Nominal cropping and scraping herbivores surveyed in UVC. Species with feeding observations are indicated in bold.

|                    | Parameter                      | Prior            | Mean   | Lower 89% | Upper 89% | Effective samples | $\hat{R}$ |
|--------------------|--------------------------------|------------------|--------|-----------|-----------|-------------------|-----------|
| Cropping bite rate | X                              | $N(3.43, 10)$    | 3.346  | 2.655     | 4.080     | 357               | 1.00      |
|                    | $\theta$                       | $Exp(2)$         | 4.937  | 4.546     | 5.239     | 1500              | 1.00      |
|                    | species                        | $N(0, \sigma_s)$ | 0.414  | 0.172     | 0.622     | 486               | 1.00      |
|                    | genus                          | $N(0, \sigma_G)$ | 0.453  | 0.004     | 0.839     | 188               | 1.03      |
|                    | region                         | $N(0, \sigma_d)$ | 0.372  | 0.004     | 0.753     | 356               | 1.00      |
|                    | $\sigma_s, \sigma_G, \sigma_d$ | $Cauchy(0, 1)$   |        |           |           |                   |           |
| Scraping bite rate | A                              | $N(3.10, 10)$    | 3.161  | 2.491     | 3.794     | 718               | 1.00      |
|                    | B                              | $N(0, 5)$        | -0.028 | -0.031    | -0.025    | 3500              | 1.00      |
|                    | $\theta$                       | $Exp(1)$         | 1.624  | 1.512     | 1.733     | 2708              | 1.00      |
|                    | species                        | $N(0, \sigma_s)$ | 0.408  | 0.302     | 0.501     | 1872              | 1.00      |
|                    | genus                          | $N(0, \sigma_G)$ | 0.650  | 0.184     | 1.085     | 830               | 1.00      |
|                    | region                         | $N(0, \sigma_d)$ | 0.282  | 0.049     | 0.532     | 737               | 1.00      |
|                    | $\sigma_s, \sigma_G, \sigma_d$ | $Cauchy(0, 1)$   |        |           |           |                   |           |
| Scraping bite area | A                              | $N(4.45, 5)$     | 2.459  | 2.354     | 2.568     | 1182              | 1.00      |
|                    | B                              | $N(0, 2)$        | 0.060  | 0.057     | 0.062     | 1052              | 1.00      |

**Table S2** | Bayesian priors and model convergence indicators for feeding rate models (Eqs 1,2, 4-7). Priors are weakly informative, except for intercept priors which were set at the mean bite rate or bite area (on a log scale). Parameter symbols are defined in Eqs. 4 – 7, and  $\theta$  is the scale parameter for the Gamma distribution.  $N(0, 10)$  is a normal distribution with mean = 0 and standard deviation = 10,  $Cauchy(0, 1)$  is a Cauchy distribution with location = 0 and scale = 1. Estimates for random effect variances not shown.