Table S1: Species of *Gobiomorphus* and outgroups sequenced for ultraconserved elements. Vouchers indicated with NMNZ codes are deposited at Te Papa Tongarewa, the National Museum of New Zealand, and those with LACM codes are deposited in the fish tissue collection of the Natural History Museum of Los Angeles County. The voucher for *G. alpinus* was lost after the tissue sample was collected, and vouchers are pending for some species. The samples for *G. basalis* south and *G. breviceps* south will be vouchered at NMNZ, those with PU field codes are pending at the Australian Biological Tissue Collection (ABTC), South Australian Museum, Adelaide, Australia. Pending vouchers may be traced by their field codes and species identifications at the depositing museums.

Species Voucher Locality

**Eleotridae**

*G. alpinus* no voucher Bowscale Tarn, Clarence River, NZ

*G. cotidianus* NMNZ P.061396 Port Waikato, NZ

*G. basalis* north NMNZ P.061390 Karapiro Stream, Waikato River, NZ

*G. basalis* south CRA.WAI.5 Wairau River, NZ

*G. breviceps* north NMNZ P.061388 Mangoparo Stream, Mokau River, NZ

*G. breviceps* south Up.B.SE.14 Hakataramea River, NZ

*G. gobioides* NMNZ P.061386 Welcome Bay (Tauranga Harbor), NZ

*G. huttoni* NMNZ P.061393 Waitao Stream (Tauranga Harbor), NZ

*G. hubbsi* NMNZ P.061391 Waitao Stream (Tauranga Harbor), NZ

*G. australis* PU14-4GA-1 Williams Creek, Georges River, New South Wales, AUS

*G. coxii* PU14-85GC-1 Nepean River, New South Wales, AUS

*Hypseleotris compressa* PU97-88EG-3 Trunding Creek, Embley River, Queensland, AUS

*Hypseleotris klunzingeri* PU01-52CG-X Vandyke Creek, Fitzroy River, Queensland, AUS

*Giurus margaritacea* LACM T-000073Ross River, Queensland, AUS

*Mogurnda adspersa* LACM T-000130Townsville, Queensland, AUS

*Philypnodon grandiceps* PU14-167PG-1Wollondilly River, New South Wales, AUS

*Philypnodon macrostoma* PU14-53PM.1Orara River, New South Wales, AUS

**Butidae**

*Oxyeleotris lineolata* LACM T-000022Adelaide River, Northern Territory, AUS

**Odontobutidae**

*Perccottus glenii* LACM T-000032Dniestr River, Russia