S2. Summary of assumptions tested by each model, where: Total S = total species richness, Carnivorous S = carnivorous species richness, Omnivorous S = omnivorous species richness, Herbivorous S = herbivorous species richness, Migrant S = migrant species richness, Resident S = resident species richness, Pelagic P = pelagic species richness, Benthopelagic B = benthopelagic species richness, OW = open water, FH = flooded herbaceous, FS = flooded shrubs, FF = flooded forest, n = number of collected fish.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Season/Buffer | Diversity level | Moran I | Variance Inflation Factor: Initial Model  | Variance Inflation Factor: Final Model |
| High water 500 | Total SCarnivorous SOmnivorous SHerbivorous SMigrants SResidents SPelagics PBenthopelagic B | P = 0.43P = 0.21P = 0.18P = 0.54P = 0.19P = 0.54P = 0.52P = 0.48 | OW = 3.62, FH = 2.15, FS = 1.78FF = 5.44, n = 1.42OW = 3.56, FH = 2.21, FS = 1.79FF = 5.59, n = 1.45OW = 3.55, FH = 2.11, FS = 1.85FF = 5.39, n = 1.45OW = 4.10, FH = 2.19, FS = 1.86FF = 5.77, n = 1.41OW = 3.85, FH = 2.27, FS = 1.82FF = 5.75, n = 1.41OW = 3.45, FH = 2.06, FS = 1.74FF = 5.19, n = 1.43OW = 3.31, FH = 2.09, FS = 1.69FF = 5.14, n = 1.38OW = 3.83, FH =2.19, FS = 1.84FF = 5.66, n= 1.43 | OW = 1.05, FH = 1.36,FS = 1.32, n = 1.13OW = 1.04, FH = 1.41,FS = 1.35, n = 1.13OW = 1.05, FH = 1.35,FS = 1.31, n = 1.12OW = 1.07, FH = 1.33,FS = 1.31, n = 1.15OW = 1.05, FH = 1.39,FS = 1.34, n = 1.14OW = 1.05, FH = 1.34,FS = 1.30, n = 1.13OW = 1.05, FH = 1.35, FS = 1.30, n = 1.12OW = 1.05, FH = 1.37FS = 1.33, n = 1.14  |
| High water 1000 | Total SCarnivorous SOmnivorous SHerbivorous SMigrants SResidents SPelagics PBenthopelagic B | P = 0.26P = 0.10P = 0.10P = 0.98P = 0.09P = 0.75P = 0.23P = 0.02 | OW = 5.02, FH = 2.23, FS = 1.45, FF = 6.21, n = 1.48OW = 4.94, FH = 2.18, FS = 1.45FF = 6.26, n = 1.53OW = 4.69, FH = 2.16, FS = 1.46FF = 5.87, n = 1.47OW = 5.43, FH = 2.30, FS = 1.46FF = 6.34, n = 1.47OW = 5.26, FH = 2.36, FS = 1.44FF = 6.53, n = 1.47OW = 4.91, FH = 2.14, FS = 1.46FF = 5.99, n = 1.49OW = 4.67, FH = 2.17, FS = 1.44FF = 6.12, n = 1.48OW = 5.25, FH = 2.28, FS = 1.46FF = 6.31, n = 1.48 | OW = 1.09, FH = 1.05, FS = 1.20, n = 1.12OW = 1.09, FH = 1.05,FS = 1.19, n = 1.11OW = 1.10, FH = 1.05,FS = 1.18, n = 1.11OW = 1.12, FH = 1.05,FS = 1.23, n = 1.14OW = 1.09, FH = 1.05,FS = 1.21, n = 1.13OW = 1.10, FH = 1.05,FS = 1.20, n = 1.12OW = 1.07, FH = 1.05FS = 1.19, n = 1.13OW = 1.11, FH = 1.05FS = 1.21, n = 1.12 |
| High water 5000 | Total SCarnivorous SOmnivorous SHerbivorous SMigrants MResidents RPelagics PBenthopelagic B | P = 0.96P = 0.27P = 0.62P = 0.14P = 0.23P = 0.21P = 0.82P = 0.56 | OW = 1.97, FH = 1.27, FS =2.42,FF = 3.47, n = 1.48OW = 1.97, FH =1.33, FS = 2.58, FF = 3.45, n = 1.450W = 2.04, FH = 1.31, FS = 2.37, FF = 3.44, n = 1.46 OW = 1.97, FH = 1.26, FS = 2.32, FF = 3.45, n = 1.47OW = 1.99, FH = 1.26, FS = 2.43,FF = 3.50, n = 1.46OW = 1.96, FH = 1.28, FS = 2.42,FF = 3.45, n = 1.47OW = 1.91, FH = 1.23, FS = 1.51,FF = 1.98, n = 1.49OW = 2.02, FH = 1.30, FS = 2.39,FF = 3.44, n = 1.45 | OW = 1.24, FH = 1.17,FS = 1.64, n = 1.30OW = 1.30, FH = 1.21, FS = 1.69, n = 1.30OW = 1.24, FH = 1.18,FS = 1.63, n = 1.28OW = 1.21, FH = 1.16,FS = 2.32, n = 1.47OW = 1.25, FH = 1.16,FS = 1.64, n = 1.30OW = 1.24, FH = 1.17,FS = 1.64, n = 1.29OW = 1.91, FH = 1.23, FS = 1.51, FF = 1.98, n = 1.49OW = 1.25, FH = 1.18,FS = 1.63, n = 1.28 |
| Low water 500 | Total SCarnivorous SOmnivorous SHerbivorous SMigrants MResidents RPelagics PBenthopelagic B | P = 0.11P = 0.19P = 0.06P = 0.97P = 0.47P = 0.85P = 0.74P = 0.47 | OW = 1.48, FH = 1.25, FF = 1.52, n = 1.04OW =1.40, FH = 1.17,FF = 1.45, n = 1.06OW = 1.43, FH = 1.20,FF = 1.48, n = 1.06OW = 1.44, FH = 1.21,FF = 1.50, n = 1.04OW = 1.44, FH = 1.23,FF = 1.51, n = 1.05OW = 1.51, FH = 1.25,FF = 1.53, n = 1.05OW = 1.45, FH = 1.22,FF = 1.51, n = 1.05OW = 1.49, FH = 1.26,FF = 1.53, n = 1.05 | OW = 1.48, FH = 1.25, FF = 1.52, n = 1.04OW = 1.40, FH = 1.17,FF = 1.45, n = 1.06OW = 1.43, FH = 1.20,FF = 1.48, n = 1.06OW = 1.44, FH = 1.21,FF = 1.50, n = 1.04OW = 1.44, FH = 1.23,FF = 1.51, n = 1.05OW = 1.51, FH = 1.25,FF = 1.53, n = 1.05OW = 1.45, FH = 1.22,FF = 1.51, n = 1.05OW = 1.49, FH = 1.26,FF = 1.53, n = 1.05 |
| Low water 1000 | Total SCarnivorous SOmnivorous SHerbivorous SMigrants MResidents RPelagics PBenthopelagic B | P = 0.67P = 0.03\*P = 0.02\*P = 0.85P = 0.68P = 0.23P = 0.95P = 0.70 | OW = 2.97, FH = 2.14,FF = 3.71, n = 1.22OW = 2.81, FH = 2.01,FF = 3.58, n = 1.19OW = 2.79, FH = 2.05,FF = 3.59, n = 1.19OW = 2.91, FH = 2.02,FF = 3.65, n = 1.01OW = 2.81, FH = 2.15,FF = 3.66, n = 1.22OW = 3.09, FH = 2.10,FF = 3.73, n = 1.22OW = 3.01, FH = 2.18,FF = 3.75, n = 1.22OW = 2.95, FH =2.11, FF = 3.67, n = 1.22 | OW = 1.07, FH = 1.06,n = 1.02OW = 1.05, FH = 1.03,n = 1.01OW = 1.05, FH = 1.04,n = 1.01OW = 1.06, FH = 1.04,n = 1.01OW = 1.06, FH = 1.04,n = 1.01OW = 1.08, FH = 1.06,n = 1.02OW = 1.07, FH = 1.05,N = 1.01OW = 1.07, FH = 1.05,N = 1.02 |
| Low water 5000 | Total SCarnivorous SOmnivorous SHerbivorous SMigrants MResidents RPelagics PBenthopelagic B | P = 0.98P = 0.38P = 0.53P = 0.13P = 0.34P = 0.26P = 0.35P = 0.98 | OW = 2.18, FH = 1.52, FS = 1.54,FF = 2.29, n = 1.22OW = 2.06, FH = 1.59, FS = 1.52,FF = 2.31, n = 1.21OW = 1.95, FH = 1.51, FS = 1.53,FF = 2.06, n = 1.20OW = 2.02, FH = 1.52, FS = 1.52,FF = 2.12, n = 1.19OW = 2.28, FH = 1.62, FS = 1.54,FF = 2.53, n = 1.22OW = 2.08, FH = 1.46, FS = 1.52,FF = 2.13, n = 1.21OW = 2.28, FH = 1.59, FS = 1.56,FF = 2.43, n = 1.21OW = 2.12, FH = 1.49, FS =1.52,FF = 2.24, n = 1.22 | OW = 1.50, FH, 1.17,FS = 1.48, n = 1.10OW = 1.48, FH, 1.19,FS = 1.49, n = 1.08OW = 1.48, FH = 1.19,FS = 1.50, n = 1.09OW = 1.49, FH = 1.17,FS = 1.49, n = 1.09OW = 1.50, FH = 1.17,FS = 1.49 n = 1.10OW = 1.49, FH = 1.15,FS = 1.47, n = 1.10OW = 1.51, FH = 1.18,FS = 1.49, n = 1.10OW = 1.48, FH = 1.16,FS = 1.47, n = 1.22 |