

BUDGET JUSTIFICATION

A. SENIOR PERSONNEL

The University of Idaho has determined the salary year for senior personnel to be based on the calendar year.

Adam G. Jones will oversee all phases of the proposed project. Dr. Jones has used molecular and ecological methods to study the evolution of syngnathid fishes for over two decades. He has expertise in sexual selection, evolutionary biology, genomics, bioinformatics and computational biology. We are requesting one month of summer salary per year for Dr. Jones. His current salary is \$12,275 per month, and we have budgeted for a three percent increase per year.

B. OTHER PERSONNEL

B3. Graduate Students. Two to-be-named graduate students will be recruited to work on this project at the University of Idaho. The starting annual salary will be \$24,000, and we have budgeted for a three percent increase per year.

C. FRINGE BENEFITS – Fringe for Dr. Jones is 30.9 percent. Fringe for the graduate students is 3.4 percent.

E. TRAVEL

E1. Domestic Travel. This project will require domestic collecting trips to the Puget Sound (for *Syngnathus leptorhynchus*) and Florida (*S. scovelli*, *S. floridae*, *Hippocampus erectus*, and *H. zosterae*). Three members of the Jones Lab will drive to Puget Sound in Year 1 to collect *S. leptorhynchus*, and we have budgeted \$1500 for this trip. Two members of the Jones Lab will fly to Tampa in Year 3 to meet up with Emily Rose and Heather Masonjones for the field work in Florida. We have budgeted \$3000 to cover this trip. We are also requesting \$2000 per year for travel to domestic conferences. Finally, our proposed syngnathid workshop will be budgeted as travel, because travel to the workshop and housing are the main expenses. We are requesting \$4,000 in Years 2 and 4 to cover travel for invited speakers and housing for instructors.

E2. Foreign Travel. Two major foreign collecting trips will be necessary to complete our aims. In Year 1, two members of the Jones Lab will travel to Portugal to work with Nuno Monteiro to collect three species in the genus *Nerophis* and the seahorse *Hippocampus guttulatus*. This trip will also include a detour to mainland Europe, where *N. maculatus* and *N. ophidion* are more abundant than in Portugal. We have budgeted \$12,000 for this trip. In Year 2, two members of the Jones Lab and collaborator Graham Short will travel to Japan and Australia to collect the three species of *Doryrhamphus* indicated in the Project Description. We have budgeted \$4,000 per person, or a total of \$18,000, for this trip.

F. PARTICIPANT SUPPORT. We are requesting \$6,000 in Years 2 and 4 to partially offset the housing and travel of participating students, up to 15 students per workshop.

G. OTHER DIRECT COSTS

G1. Materials and Supplies. The largest expense in this proposal is the sequencing related to the proposed techniques. For the six species in the genera *Syngnathus* and *Hippocampus*, genome sequencing will involve two lanes of PacBio Sequel II SMRT sequencing and a lane of Illumina HiSeq4000 sequencing, which will be split between a small insert library and a Hi-C library. We anticipate the cost

per genome for these species to be \$7,620, including library preparation. For species in the genera *Nerophis* and *Doryrhamphus*, we expect the genomes to be somewhat larger, so we will double the amount of PacBio sequencing, resulting in a total cost of \$10,620 per genome, including library preparation. Thus, in Year 1 (*Syngnathus* and *Hippocampus*), we are requesting \$45,720 for whole-genome sequencing, and in Year 2 (*Doryrhamphus* and *Nerophis*), we are requesting \$63,720. For the RNA-seq work, we will need to construct 360 libraries at \$47 each and run 30 lanes of Illumina HiSeq4000 (\$2820 per lane), for a total of \$101,520 split evenly across the first three years of the project. For RADseq, the entire study calls for the genotyping of 2,400 samples. Library preparation costs \$10 per sample, and we can run 200 samples per lane of Illumina HiSeq4000 (\$2820 per lane), calling for a total of 12 lanes. Hence, we expect the total cost of RADseq to be \$57,840, split evenly across the last three years of the project. The totals for whole-genome sequencing, RNA-seq and RADseq combined, then, are \$79,560, \$116,840, \$53,120, and \$19,280 in Years 1 through 4, respectively. We are also requesting \$2,000 a year to cover miscellaneous lab expenses.

G2. Publication Costs. We are requesting \$1000 per year to cover page charges.

G4. Computer (ADPE) Services. The fee for access to the IBEST computing cluster at the University of Idaho is \$2,000 per person per year, so we have requested funds to cover this fee for both graduate students.

G6. Other. We are requesting funds to cover graduate student tuition and fees, which we expect to be \$11,778 per student in Year 1, with a 3 percent increase per year.

I. INDIRECT COSTS. (\$295,528 total over four years)

The University of Idaho Indirect Cost rate is 47.5%. Graduate Student Fees and Insurance are not subject to indirect costs. Subcontract costs in excess of \$25,000 are not subject to indirect costs.