The eco-physiology of taxa in an evolutionary context can best be studied by comparison of parameter values of the energy budget that accounts for the inter-relationships of all endpoints of energy allocation. To this end, the parameters of the standard Dynamic Energy Budget (DEB) model have been estimated for 64 fish species from all 5 fish classes. The values are compared with those of the whole collection of over 300 species from most large animal phyla. The goodness of fit was very high, but the data were rather incomplete, compared with the energy balance for full life cycles. Metabolic acceleration, where maximum specific assimilation and energy conductance increase with length between birth and metabolic metamorphosis, seems to be confined, among fish, to some species of ray-finned fish and seems to have evolved several times independently in this taxon. We introduce a new altriciality index, i.e. the ratio of the maturity levels at puberty and birth, and conclude that ray-finned fish are more altricial, and cartilaginous fish more precocial than typical animals. Fish allocate more to reproduction than typical animals. Parameter estimates show that 66% of the fish species considered invest less in reproduction than the value that would maximize the reproduction rate of fully grown individuals. By comparison, 85% of the all animal species in the collection does so. Consistent with theoretical expectations, allocation to reproduction and maturity at birth increases with cubed (ultimate structural) length, and reserve capacity with length for non-ray-finned fish, with the consequence that reproduction rate decreases with length. Ray-finned fish, however, have a maturity at birth and a reserve capacity almost independent of length, and a reproduction rate that increases with cubed length. Reserve capacity tends to increase with ultimate length for non-accelerating ray-finned fish, but not for accelerating species. Reproduction rate decreases inter-specifically with length in non-ray-finned fish, as expected, but increases with cubed length in ray-finned fish. This pattern follows naturally from the patterns of size at birth and reserve capacity and can be seen as adaptation to the predation of prey of ray-finned fish on their tiny neonates. Both the von Bertalanffy growth rate and the specific allocation to reproduction in fully grown adults correlate positively with specific somatic maintenance among fish species. These observations support the recently proposed waste-to-hurry hypothesis. Determinatesness increases in the sequence: fish, amphibians, reptiles, mammals and birds.