

## Supplementary material part 3

### Derivation of allometric rule describing movement cost of predator

We apply the derivation of Peters (see Table 6.3 in Peters 1983).

#### Parameters as applied in Peters (1983):

$R_m$ : metabolic rate during movement (Watts)

$R_b$ : basal metabolic rate (Watts)

$V_n$ : normal or optimal speed (m/s)

$T_{c(net)}$ : net transport cost (J/m)

From Fedak & Seeherman (1979):

$$T_{c(net)} = 11.3 W^{0.72}$$

From Hirt et al. (2017):

$$V_n = 1.0045 W^{0.42}$$

From Hemmingsen (1960):

$$R_b = 0.14 W^{0.751}$$

$$R_m = 1.2 (R_b) + T_{c(net)} * V_n$$

$$R_m = 1.2 * (0.14 W^{0.75}) + (11.3 W^{0.72}) * (1.0045 W^{0.42})$$

$$R_m = 0.17 W^{0.75} + 11.35 W^{1.14}$$