

Population & Community Ecology Homework 1

Problem 1

In this problem we look to find the density of duckweed plants per m^2 after 47 days. We will estimate the future population using the exponential growth formula, $N_t = N_0 e^{rt}$ where the initial population, N_0 , is 11.1 duckweed plants per m^2 . We can calculate the rate of unitless population change, r , by dividing the estimate after 20 day from the initial population.

```
r = 23.5/11.1  
r
```

```
## [1] 2.117117
```

Thus with $r = 2.12$, we can calculate N_{27} as $N_{27} = 11.1e^{2.12 \times 47}$.

```
n27 <- 11.1*exp(2.12*47)  
n27
```

```
## [1] 2.081734e+44
```

Thus after a total of 47 days, the population density will be 2.08×10^{44} duckweed plants per m^2 .

Problem 2