

In [5]:

```
library(tidyverse)
library(skimr)
library(magrittr)
```

Attaching package: 'magrittr'

The following object is masked from 'package:purrr':

set\_names

The following object is masked from 'package:tidyr':

extract

In [6]:

```
new_animal <- read_csv("new-animals_all.csv")
```

Parsed with column specification:

```
cols(
  index = col_double(),
  `Common Name` = col_character(),
  `Endangered Animals of Area` = col_character(),
  `Scientific Name:` = col_character(),
  `Other Names and/or Listed subspecies:` = col_character(),
  `Group:` = col_character(),
  `Status/Date Listed as Endangered:` = col_character(),
  `Area(s) Where Listed As Endangered:` = col_character(),
  Area = col_character(),
  Status = col_character()
)
```

In [56]:

```
new_animal %>%
  glimpse()
```

```
Observations: 1,328
Variables: 10
$ index          <dbl> 1, 2, 3, 4, 5, 6, 7,
8, 9, 10...
$ `Common Name`  <chr> "Abbott's Duiker",
"Aberdare ..."
$ `Endangered Animals of Area`
of Africa...      <chr> "Endangered Mammals
$ `Scientific Name:`
x", "Surdis...    <chr> "Cephalophus spadi
$ `Other Names and/or Listed subspecies:`
hrew", NA...      <chr> "Minde", "Aberdare S
$ `Group:`       <chr> "Mammals", "Mammal
s", "Mammal...
$ `Status/Date Listed as Endangered:`
-IUCN: 20...      <chr> "EN-IUCN: 2008", "VU
$ `Area(s) Where Listed As Endangered:`
"North A...      <chr> "Tanzania", "Kenya",
$ Area           <chr> "Africa", "Africa",
"Africa",...
$ Status         <chr> "EN", "VU", "CR", "C
R", "VU",...
```

In [9]:

```
new_animal[new_animal$Area == "Hawaii", ]%<>% mutate(Area = "North America")
new_animal[new_animal$Area == "Central America", ]%<>% mutate(Area = "North America")
new_animal[new_animal$Area == "Australia", ]%<>% mutate(Area = "the Oceans and Island Nations")
```

In [10]:

```
new_animal[new_animal$Area == "the Oceans and Island Nations", ]%<>% mutate(Area = "Oceania")
new_animal[new_animal$Area == "the Middle East", ]%<>% mutate(Area = "Middle East")
```

In [11]:

```
new_animal <- new_animal %>% filter(!is.na(Status))
new_animal[new_animal$Status == "T-", ] %<>% mutate(Status = "NT")
```

In [12]:

```
Status_total <- new_animal %>%
  group_by(Status, Area) %>%
  tally() %>%
  group_by(Area) %>%
  summarise(total=sum(n))
```

In [13]:

```
Status_Area_count <- new_animal %>%  
  group_by(Status, Area) %>%  
  tally()
```

In [14]:

```
Status_Area_combine <- Status_Area_count %>%  
  full_join(Status_total, by = "Area")
```

In [15]:

```
Status_Area_combine
```

A grouped\_df: 32 × 4

Status	Area	n	total
<chr>	<chr>	<int>	<int>
CR	Africa	15	253
CR	Asia	27	333
CR	Europe	2	86
CR	Middle East	1	67
CR	North America	26	222
CR	Oceania	14	152
CR	South America	19	206
DD	South America	1	206
EN	Africa	131	253
EN	Antarctica	5	9
EN	Asia	133	333
EN	Europe	24	86
EN	Middle East	23	67
EN	North America	102	222
EN	Oceania	68	152
EN	South America	68	206
NT	Africa	50	253
NT	Antarctica	2	9
NT	Asia	80	333
NT	Europe	33	86
NT	Middle East	22	67
NT	North America	50	222
NT	Oceania	38	152
NT	South America	51	206
VU	Africa	57	253
VU	Antarctica	2	9
VU	Asia	93	333
VU	Europe	27	86
VU	Middle East	21	67
VU	North America	44	222
VU	Oceania	32	152
VU	South America	67	206

In [16]:

```
Status_Area_combine$Status <- as_factor(Status_Area_combine$Status)
Status_Area_combine$Status %>% class
```

'factor'

In [17]:

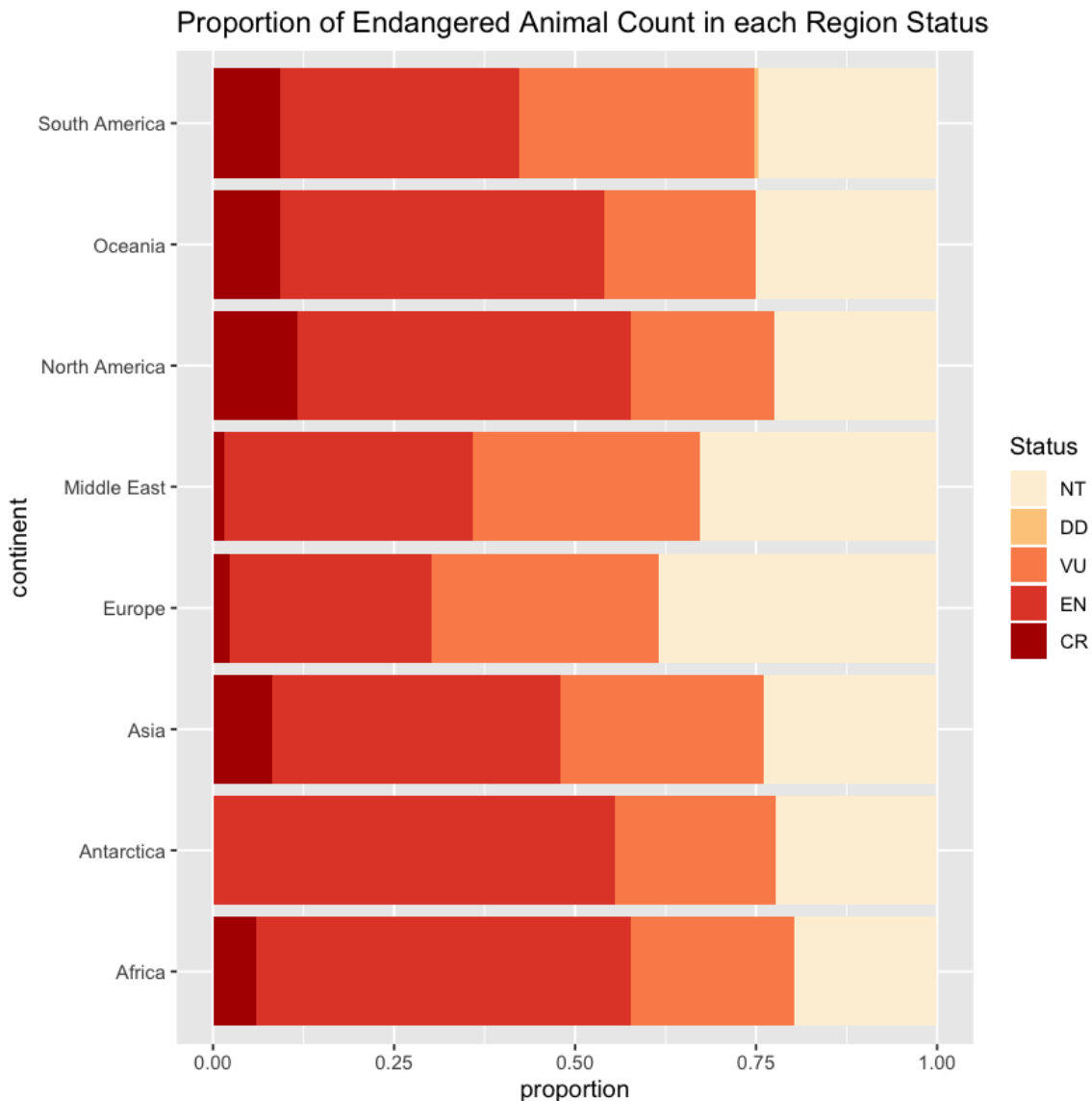
```
Status_Area_combine$Status <- factor(Status_Area_combine$Status, levels = c("NT"
, "DD", "VU", "EN", "CR"))
```

In [18]:

```
animal_plot <- Status_Area_combine %>%
  ggplot() +
  geom_bar(aes(x=Area, y=n/total, fill=Status),stat="identity")+
  scale_fill_brewer(palette="OrRd") +
  ggtitle("Proportion of Endangered Animal Count in each Region Status") +
  labs(y="proportion", x = "continent") +
  coord_flip()
```

In [19]:

animal\_plot



In [20]:

```
Status_total$Area <- as.factor(Status_total$Area)
Status_total <- Status_total %>%
  mutate(proportion = total/sum(total)) %>%
  arrange(desc(proportion))
```

In [21]:

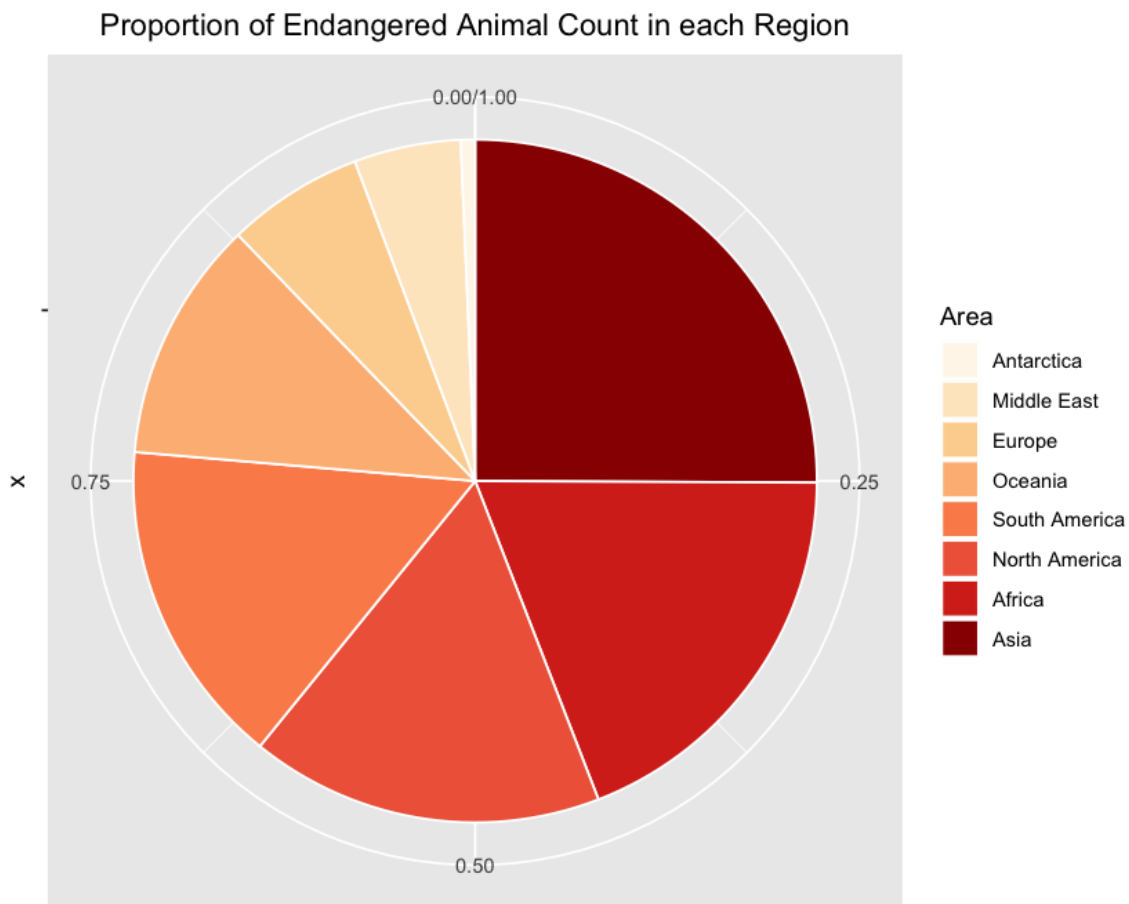
```
#reorder origin by ascending count
Status_total$Area <- reorder(Status_total$Area, Status_total$proportion)
```

In [22]:

```
animal_plot2 <- Status_total %>%
  ggplot(aes(x="", y=proportion, fill=Area))+
  geom_bar(width = 1, stat = "identity", color = "white") +
  coord_polar("y", start=0) +
  scale_fill_brewer(palette="OrRd") +
  ggtitle("Proportion of Endangered Animal Count in each Region") +
  theme(plot.title = element_text(hjust = 0.5), axis.title.x = element_blank())
```

In [31]:

```
animal_plot2
```



In [32]:

```
Africa <- read_csv(file = "Africa.csv")
```

Parsed with column specification:

```
cols(  
  Year = col_double(),  
  Value = col_double()  
)
```

In [33]:

```
Africa$pos = Africa$Value >= 0
```

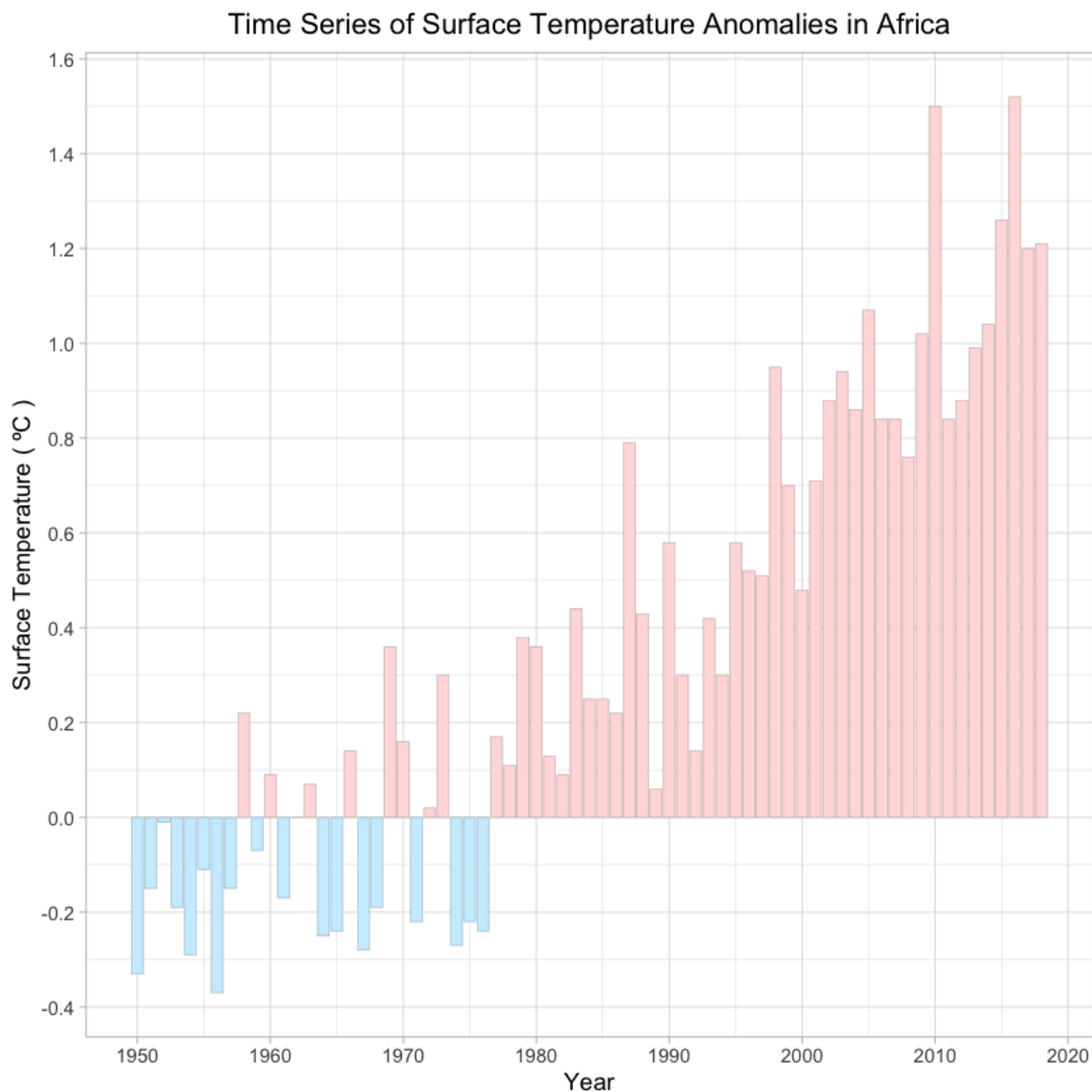


In [34]:

```

Africa_climate_plot <- Africa %>%
  filter( Year >= 1950) %>%
  ggplot(aes(
    x = Year,
    y = Value,
    fill = pos)) +
  labs(title = "Time Series of Surface Temperature Anomalies in Africa") +
  scale_x_continuous(breaks=seq(1950, 2020, 10)) +
  scale_y_continuous(breaks=seq(-1, 1.8, 0.2)) +
  geom_bar(stat = "identity", position = "identity", colour = "black", size =
0.05) +
  xlab("Year") + ylab ("Surface Temperature ( °C )") +
  theme_light()+
  theme(plot.title = element_text(hjust = 0.5)) +
  scale_fill_manual(values = c("#CCEEFF", "#FFDDDD"), guide = FALSE)
Africa_climate_plot

```



In [57]:

```
population <- read_csv(file = "population.csv")
```

Parsed with column specification:

```
cols(  
  Country.Name = col_character(),  
  Country.Code = col_character(),  
  Year = col_double(),  
  Value = col_double()  
)
```

In [58]:

```
population %>%  
  glimpse()
```

Observations: 1,254

Variables: 4

\$ Country.Name <chr> "Caribbean small states", "Caribbean small states", "Car...

\$ Country.Code <chr> "CSS", "CSS", "CSS", "CSS", "CSS", "CSS", "CSS", "CSS", ...

\$ Year <dbl> 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 19...

\$ Value <dbl> 4198307, 4277802, 4357746, 4436804, 4513246, 4585777, 46...

In [59]:

```
target <- c("North America", "South Asia",  
            "East Asia & Pacific", "Latin America & Caribbean",  
            "Middle East & North Africa", "Europe & Central Asia", "Sub-Saharan  
            Africa")
```

In [60]:

```
population1 <- population %>%  
  filter(Country.Name %in% target)  
population1
```

A spec\_tbl\_df: 399 × 4

Country.Name	Country.Code	Year	Value
<chr>	<chr>	<dbl>	<dbl>
East Asia & Pacific	EAS	1960	1042016962
East Asia & Pacific	EAS	1961	1045307974
East Asia & Pacific	EAS	1962	1059467033
East Asia & Pacific	EAS	1963	1084916211
East Asia & Pacific	EAS	1964	1109997197
East Asia & Pacific	EAS	1965	1136131881
East Asia & Pacific	EAS	1966	1165700563
East Asia & Pacific	EAS	1967	1194329626
East Asia & Pacific	EAS	1968	1223381452
East Asia & Pacific	EAS	1969	1255964340
East Asia & Pacific	EAS	1970	1288580672
East Asia & Pacific	EAS	1971	1322181844
East Asia & Pacific	EAS	1972	1354002849
East Asia & Pacific	EAS	1973	1384272287
East Asia & Pacific	EAS	1974	1414384540
East Asia & Pacific	EAS	1975	1441541935
East Asia & Pacific	EAS	1976	1465814651
East Asia & Pacific	EAS	1977	1488757160
East Asia & Pacific	EAS	1978	1511580462
East Asia & Pacific	EAS	1979	1534795624
East Asia & Pacific	EAS	1980	1557506468
East Asia & Pacific	EAS	1981	1580901245
East Asia & Pacific	EAS	1982	1606486447
East Asia & Pacific	EAS	1983	1632005817
East Asia & Pacific	EAS	1984	1656292670
East Asia & Pacific	EAS	1985	1681267479
East Asia & Pacific	EAS	1986	1707960613
East Asia & Pacific	EAS	1987	1736144967
East Asia & Pacific	EAS	1988	1764605492
East Asia & Pacific	EAS	1989	1792425355
:	:	:	:
Sub-Saharan Africa	SSF	1987	470171799
Sub-Saharan Africa	SSF	1988	483582771
Sub-Saharan Africa	SSF	1989	497327000
Sub-Saharan Africa	SSF	1990	511410066
Sub-Saharan Africa	SSF	1991	525853526

Country.Name	Country.Code	Year	Value
<chr>	<chr>	<dbl>	<dbl>
Sub-Saharan Africa	SSF	1992	540652248
Sub-Saharan Africa	SSF	1993	555771276
Sub-Saharan Africa	SSF	1994	571168197
Sub-Saharan Africa	SSF	1995	586808269
Sub-Saharan Africa	SSF	1996	602697335
Sub-Saharan Africa	SSF	1997	618872438
Sub-Saharan Africa	SSF	1998	635394495
Sub-Saharan Africa	SSF	1999	652354818
Sub-Saharan Africa	SSF	2000	669818179
Sub-Saharan Africa	SSF	2001	687543926
Sub-Saharan Africa	SSF	2002	705929160
Sub-Saharan Africa	SSF	2003	724910084
Sub-Saharan Africa	SSF	2004	744542424
Sub-Saharan Africa	SSF	2005	764866591
Sub-Saharan Africa	SSF	2006	785905014
Sub-Saharan Africa	SSF	2007	807656830
Sub-Saharan Africa	SSF	2008	830111000
Sub-Saharan Africa	SSF	2009	853238652
Sub-Saharan Africa	SSF	2010	877023136
Sub-Saharan Africa	SSF	2011	901455755
Sub-Saharan Africa	SSF	2012	926548177
Sub-Saharan Africa	SSF	2013	952278632
Sub-Saharan Africa	SSF	2014	978625082
Sub-Saharan Africa	SSF	2015	1005570801
Sub-Saharan Africa	SSF	2016	1033106135

In [41]:

```
options(scipen = 200)
```

In [42]:

```
p <- ggplot(data=population1,
  mapping = aes(
    x = Year,
    y = Value,
    color = Country.Name, group = Country.Name, fill = Country.Name)) +
  geom_line(size = 0.5) +
  scale_x_continuous(breaks=seq(1960, 2020, 5)) +
  theme_light() +
  xlab("Year") + ylab ("Population") +
  theme(axis.text.x = element_text(size = 10,vjust = 0.5, hjust = 0.5, angle =
45))+
  theme(panel.grid =element_blank())
```

In [43]:

p

