

A VERY, VERY BASIC INTROUDCTION TO SMALL POPULATIONS



for non-scientists



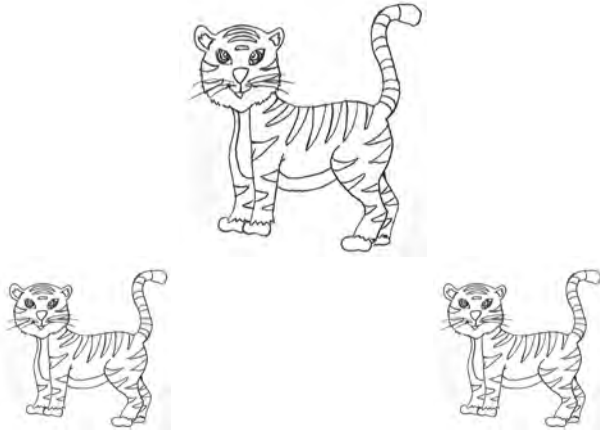
By Sally Walker

utilizing a variety of written publications, lectures, and personal communications with Tom Foose, Ulie Seal, Colin Tudge and Malcolm Whitehead (They should not be blamed, however).

WHAT IS A “SMALL POPULATION” ?????

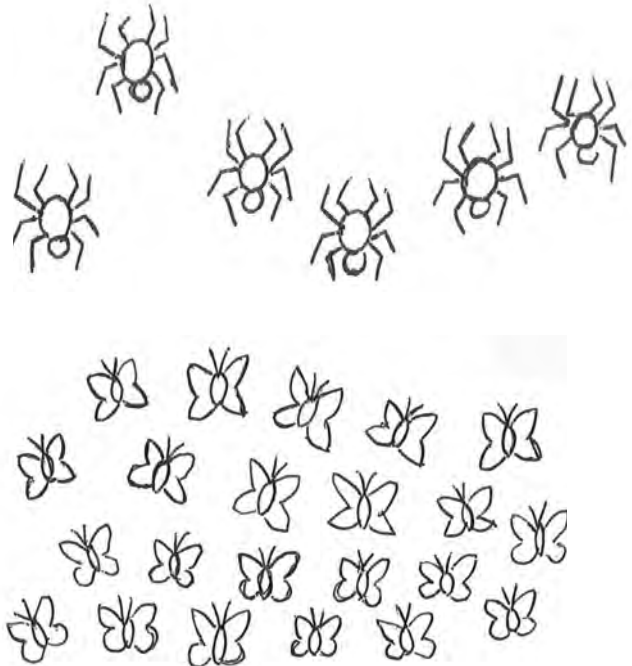
IS IT THIS ?

A small number of **BIG** things?



OR THIS?

A small number of **SMALL** things?



OR THIS?

A large number of **SMALL** things?

OR None of the above ...?

Um, No. Well, Yes. Maybe. Some of those ...

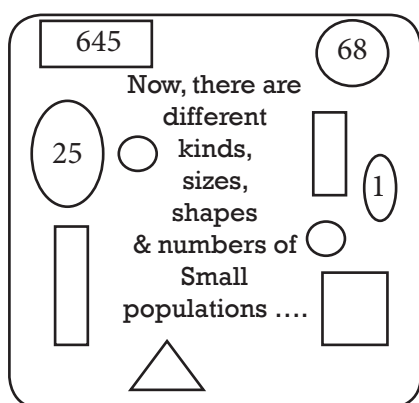
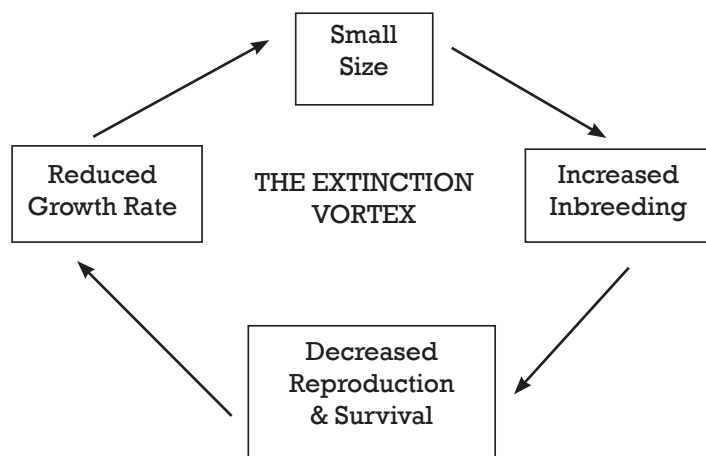
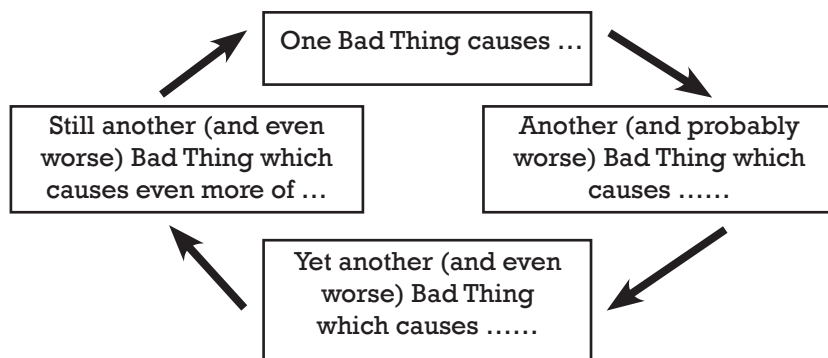
A
“small **POPULATION**”
IS A GROUP OF CREATURES
(OF THE SAME SPECIES)
THAT CANNOT
RETAIN
ENOUGH GENETIC DIVERSITY
OR
SUSTAIN
ENOUGH DUMB LUCK
TO SURVIVE
(and we **GOT TO survive!**)*

TO SURVIVE
INBREEDING
AND
RANDOM CATASTROPHES
(BAD THINGS)
OVER A
SHORT
SPAN OF TIME
OR, TO
EVOLVE ADAPTATIONS TO
INSURE EVOLUTION AND
SURVIVAL (e.g., ADJUST)
OVER A LOOOOOONG
SPAN OF TIME

A **SMALL POPULATION**
IS ONE THAT IS
VULNERABLE.
VULNERABLE TO **RISK**
THAT IS, RISK OF EXTINCTION
(e.g., NO MORE animals....
Forever)
BY A SORT OF ATTRITION.
ATTRITION =
“ONE BAD THING
LEADS TO ANOTHER
AND MAKES IT EVEN WORSE!”
THE
EXTINCTION VORTEX

*Bob Marley, Kingston, 1987

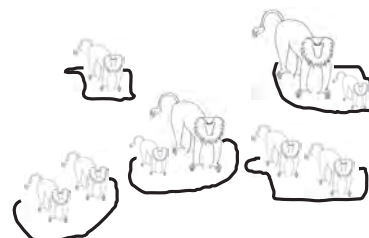
POSITIVE FEEDBACK MODEL of negative effects



A SMALL POPULATION MAY BE A SINGLE (SMALL) POPULATIONe.g., Sangai (150) IN ONE AREA ONLY in Keibul Lamjao N.P., Manipur

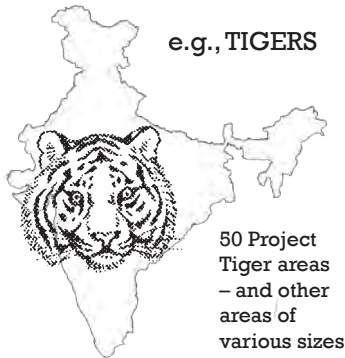


OR A FEW (SMALL) POPULATIONS IN A FEW FRAGMENTED AREAS. e.g., LION-TAILED MACAQUES



IN THREE SOUTHERN INDIAN STATES

OR MANY (SMALL)
POPULATIONS IN
MANY AREAS
WITH NO
NATURAL
CORRIDORS



NOW, USUALLY

a “SMALL POPULATION” consists of

a few 10s,

a few 100s, or even

a few 1000s

of individuals.

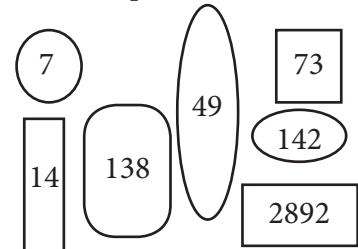
50 RHINOS
may be as
EFFECTIVE A
POPULATION AS
100 LTMs OR
1000 FLAMINGOS
OR 1000000000 FROGS

Because ... The meaning of

“SMALL”
(or large, for that matter)

depends in part on

HOW
numbers in the population
are
spread out



... how they are spread out ... in small numbers, in isolated, fragmented and otherwise stressed-out habitats.

But, small populations are in trouble

WHY ?

Because of

Walker's Law

... huh?

A very small population could survive in the wild

IF

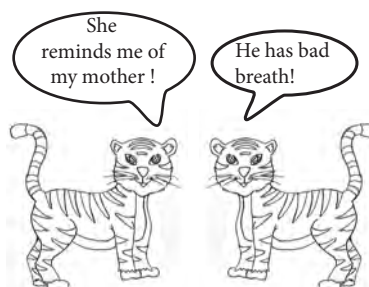
NOTHING GOES WRONK

BUT, according to

Walker's Law

IN LIFE
(AND IN NATURE)

THINGS
GO
WRONK



And what things can go wrong in Nature, pray tell?

WELL,

1. DEMOGRAPHIC THINGS

DISTORTED SEX RATIO
(i.e., a run of all male births ...)

UNSTABLE AGE STRUCTURE
(i.e., too many kids and too many grandmas)

2. REPRODUCTIVE FAILURES
(i.e., low romance factor?)



Watch this space for the next part in next issue ... on Metapopulations