

TIGER STUDBOOK

HOW SPECIES SURVIVAL PLANS PROMOTE GENETIC DIVERSITY

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Content Areas: Genetics, captive breeding, conservation, land management

Materials List: Range maps for tiger species, photos of subspecies, tiger studbooks (each should have 12 individual cards), mating combination sheets, pencils, and calculators (optional)



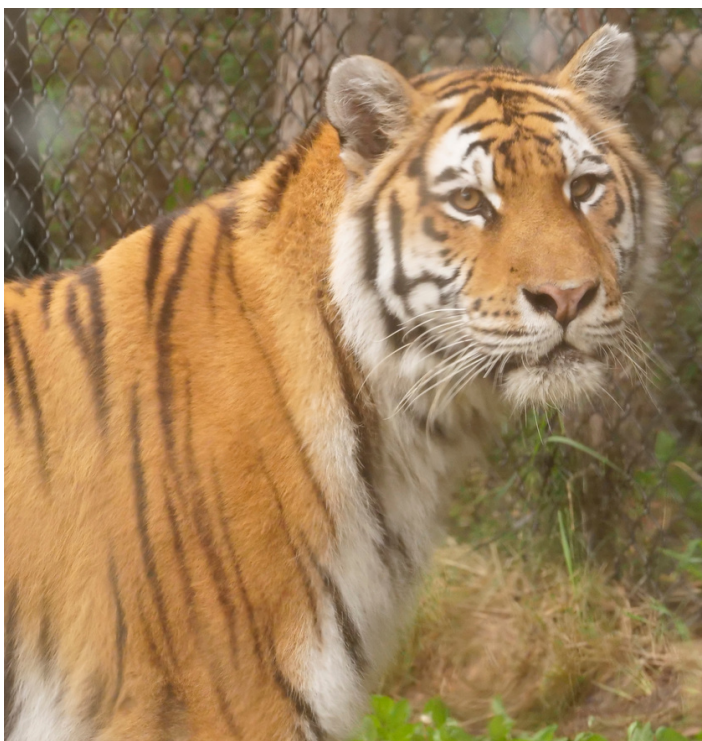
Empathy Best Practice: Assuring wellbeing, Perspective taking



Conservation Connection: Endangered species due to habitat loss/fragmentation and genetic bottlenecking



Tangible Action: Choose sustainably harvested lumber products



Background Info: This activity showcases programs with the Association of Zoos and Aquariums called Species Survival Plans. These plans are put in place to assist with the management of breeding programs of animals under human care, with the goal being to create a healthy and diverse population of animals in AZA institutions. SSPs do not typically focus on the introduction of animals into their natural habitats. Species are managed through Taxon Advisory groups, along with the creation of studbooks. Wild tigers, of all 6 subspecies, are facing extinction due to severely fragmented habitats and lack of resources. Ensuring healthy populations are maintained in zoos can help provide education for the public, as well as keep the species from going fully extinct, should wild populations decrease.



Prep:

1. Put together studbooks. Each book should have 1 profile per tiger, with 12 complete profiles per book.
2. Create copies of studbook breeding guidelines
3. If needed, review information on Species Survival Plans (SSP) and Taxon Advisory Groups (TAGs) at aza.org

Procedure:

1. Introduce species management plans: What is the purpose? Benefits? Costs?
2. Introduce activity: Students will be acting as SSP managers. Their goal is to keep a healthy population of tigers under human care to assist with genetic diversity of their subspecies of tiger.
3. Introduce subspecies: Species vs subspecies
ex.) Tigers: 6 subspecies. Amur tigers are found in colder climates with snow (have thicker, whiter coat) while Bengal tigers live in warmer, India (thinner fur and less white)
4. Divide students into small group (3-4) and distribute a studbook and copy of guidelines to each group.
5. Each group is now an SSP team. Their goal is to determine which of the individuals make the best genetic match. Using the guidelines, students should create potential breeding matches.
6. Once students feel they have potential matches, meet back together as a group.
7. Introduce mean kinship (MK): a number that determines how closely related one animal is to another on a scale of 0 (not closely related) - 10 (closely-related). Tiger pair's MK's should be averaged to determine if they are the "best" match.
8. Students should return to their studbooks and average their tiger pairs.
Most common pairs at this point are between Amur tigers Sashi, Misha, Siber, and Zarina. Which pair has the lowest average MK? (Answer: Sashi and Misha)

Procedure:

9. Now that the pair is selected, what are the next steps?

- a. Zoos need to consider location, habitat size, cost to transport the animal, and a contingency plan if the animals do not get along.
- b. When choosing to acquire an animal, zoos assess their climate, all possible space needs for the animal, food costs, vet needs, staff knowledge, and more. Zoos accredited by the Association of Zoos and Aquariums will not take an animal unless they are confident they can meet, and exceed, all of their needs.
- c. Best case scenario: Tigers get along and reproduce, increasing the diversity of the population under human care.
- d. Worst case scenario: Tigers do not get along and SSP managers have to go back to the drawing board.

Discussion:

1. After going through the process, what are some challenges for under human care breeding programs?
2. If you were a tiger, would you be a fan of the "online dating site" for animals?
3. What are some other possibilities to increase genetic diversity in tigers? What human actions can be taken to improve tiger conservation?
4. All tiger subspecies are facing extinction due to habitat fragmentation, disease (canine distemper), and reduction of space due to human development.

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STUDBOOK GUIDELINES

1. **Subspecies:** The goal of the breeding program is to support individual subspecies of tigers. Cross breeding between subspecies may result in unwanted characteristics or loss of unique features.
2. **Genetic Mutations:** Genetic mutations, like white fur in Bengal tigers, can cause health problems and prevent an animal from functioning well in their habitat.
3. **Age:** The majority of tigers are not ready to breed until they are 3 years old, and are past breeding age around 12 or 13.



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Student Worksheet

Possible Tiger Mating Combinations

	Possible Mated Pair 1	Possible Mated Pair 2	Possible Mated Pair 3	Possible Mated Pair 4
Female	Name: MK:	Name: MK:	Name: MK:	Name: MK:
Male	Name: MK:	Name: MK:	Name: MK:	Name: MK:
Notes about this possible combination				
Average MK				



Tiger Identifiers: # 97 "Zarina"	Sex: Female
Subspecies: Amur	Age: 5
Parentage: Sire: Unknown Dam: Unknown	Mean Kinship: 6



Tiger Identifiers: # 68 "Ivan"	Sex: Male
Subspecies: Amur	Age: 14
Parentage: Sire: Unknown Dam: Unknown	Mean Kinship: 1



Tiger Identifiers:
57 "Kesari"

Sex:
Female

Subspecies:
Bengal (White)

Age:
7

Parentage:
Sire: Unknown
Dam: Unknown

Mean Kinship:
9



Tiger Identifiers:
53 "Akbar"

Sex:
Male

Subspecies:
Bengal (White)

Age:
8

Parentage:
Sire: Unknown
Dam: Unknown

Mean Kinship:
9



Tiger Identifiers: # 75 "Ravi"	Sex: Male
Subspecies: Bengal	Age: 10
Parentage: Sire: Unknown Dam: Wild	Mean Kinship: 3



Tiger Identifiers: # 15 "Bali"	Sex: Male
Subspecies: Sumatran	Age: 5
Parentage: Sire: Unknown Dam: Unknown	Mean Kinship: 7



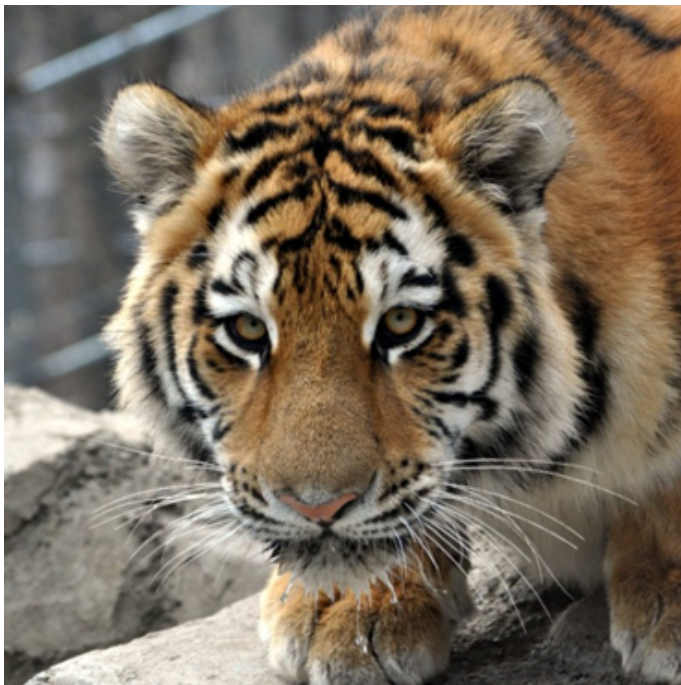
Tiger Identifiers: # 90 "Misha"	Sex: Male
Subspecies: Amur	Age: 7
Parentage: Sire: Unknown Dam: Unknown	Mean Kinship: 2



Tiger Identifiers: # 112 "Neva"	Sex: Female
Subspecies: Amur	Age: 1
Parentage: Sire: Unknown Dam: Wild	Mean Kinship: 1



Tiger Identifiers: # 83 "Siber"	Sex: Male
Subspecies: Amur	Age: 8
Parentage: Sire: Unknown Dam: Unknown	Mean Kinship: 5



Tiger Identifiers: # 89 "Sashi"	Sex: Female
Subspecies: Amur	Age: 7
Parentage: Sire: Unknown Dam: Unknown	Mean Kinship: 4



Tiger Identifiers: # 111 "Niki"	Sex: Male
Subspecies: Amur	Age: 1
Parentage: Sire: 83 Dam: 89	Mean Kinship: 3



Tiger Identifiers: # 113 "Nora"	Sex: Female
Subspecies: Amur	Age: 1
Parentage: Sire: 83 Dam: 89	Mean Kinship: 3