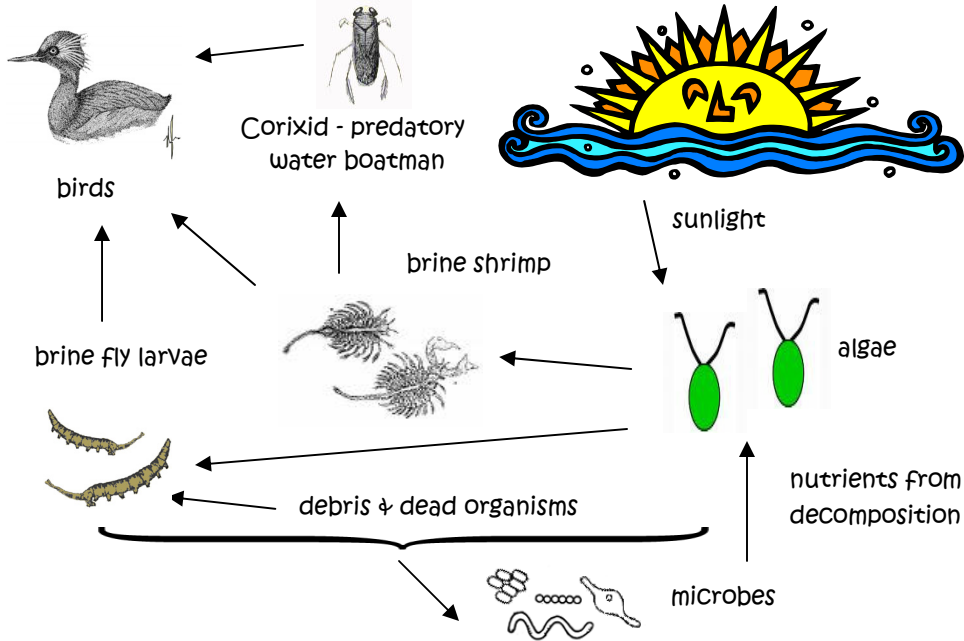
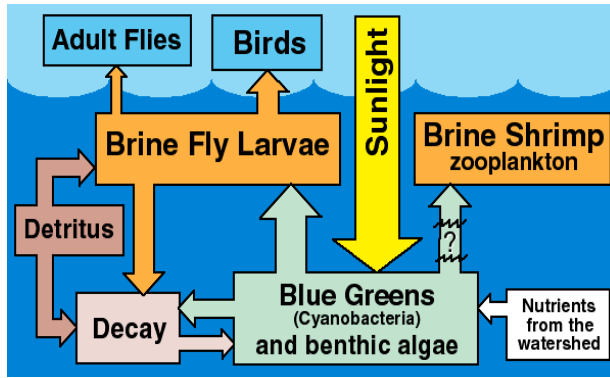


Great Salt Lake FOOD WEB

GSL's ecosystem supports a complex food web. If one part of the food web is altered, it has an effect on everything else—either directly or indirectly. Things can become unstable and even collapse if one aspect or organism is changed! One of the easiest ways to monitor Great Salt Lake is by watching the larger organisms, like birds and brine shrimp. They are great indicators of the health for the rest of the ecosystem!

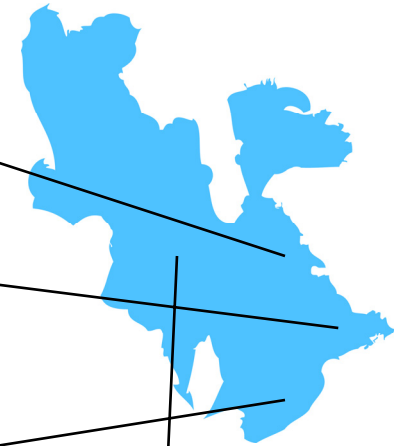
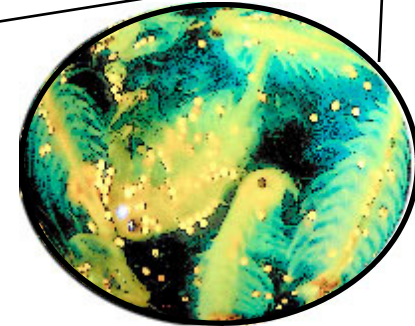
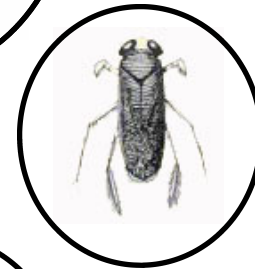


Brine shrimp aren't only food for birds and predatory beetles—brine shrimp cysts are harvested by people to feed commercially raised fish. Harvesting brine shrimp cysts in Utah brings a lot of money into the state's economy each year!



For more information about the Great Salt Lake ecosystem and answers to the puzzles in this booklet, please visit the GSL website www.wildlife.utah.gov/gsl/activities.

Welcome to Great Salt Lake

Activity and Educational Book







The Adventures of ANDY AVOCETI



Andy Avoceti  is only **1** year old and his Dad & Mom 



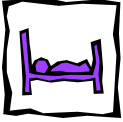

are taking him on his **1st**  migration trip

north along the Pacific Flyway. **COOL!** Or...at least it was when they

started.  was getting tired!  looked down and

 for joy as he called out, “  , you’re doing great, ”

We’re right over  and **VERY** close to **GREAT Salt Lake**  !”

His  told  they would  at  and

eat lots of brine  , brine  larvae () , and

water boatmen  to get their bellies  !

This made  very  . But  was confused too.



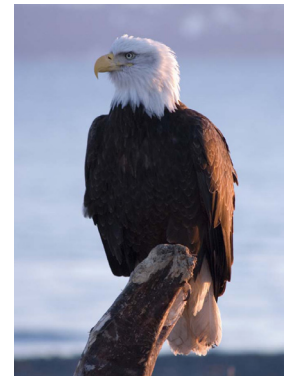
California Gulls, the State Bird of Utah, have numbered up to 160,000 breeding adults. That represents the **WORLD’S largest breeding population**—their peak populations have reached 275,000 gulls!!

10,000 **Snowy Plovers**, the world’s largest assemblage, represent 55% of the entire breeding population west of the Rocky Mountains!



Eared Grebes are some of the most abundant birds at GSL—they can reach populations over 2,000,000! That makes GSL’s grebes one of the two largest staging populations in North America.

More than 500 **Bald Eagles** winter each year at GSL—GSL is one of the top ten winter populations of bald eagles in the lower 48 states!



As many as 18,000 American White Pelicans nest at GSL. Gunnison Island is one of the three largest colonies in western North America; in the past, their migration population has peaked at 85,000 birds!!

Antelope Island is a great place to see most of these birds. For other birding trails and peak times to see specific birds at specific locations, check out the Great Salt Lake Birding Trails map, Antelope Island State Park or the Division of Wildlife Resources.

All About Birds..... Did You know???

"The Great Salt Lake is ornithologically the most impressive salt lake on the continent". Dr. Joseph R. Jehl Jr.

("Ornithologically" means "in terms of birds")

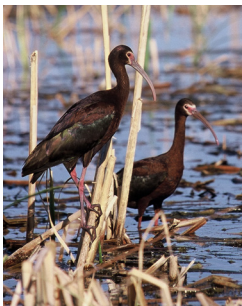


Wilson's Phalaropes can reach populations up to 500,000 a year! GSL represents the largest staging concentration in the world. These birds spin around in circles to swirl brine shrimp to the surface to eat them!



Scientists have counted 240,000 Red-necked Phalaropes in a single day's estimate!

250,000 American Avocets and 65,000 Black-necked Stilts use GSL. The populations of both are much larger than the populations at any other wetland in the Pacific Flyway.








White-faced Ibis counts of up to 23,000 breeding adults at GSL represent the WORLD'S largest breeding population of this species.

Common Goldeneye have been counted at more than 45,000 wintering birds during counts at GSL!














He asked his  "What are  ? We didn't have any of them at  !" So, to distract  until they

reached , his  and  told him everything they knew about  and .

 said, " is called a terminal lake because  flows INTO it, but no  comes out."  exclaimed,

" is 4X more  T than the OCEAN!"

The only things that can live  in the super  T  of  are  called algae , and brine 

 !" "When brine   become adults, they swarm in the millions at , but they don't bite."



added, “ eat the and grow **BIG**.



Then we **AVOCETS** join **100s** of **OTHER** species of



at . We all have special that help us



eat animals like , brine and . Lots



of us have loooooong so we can stand out of the .”



sighed, “ We eat so much so we can make the next



of our journey— and stay warm in the .



, you probably don't remember, but you were **BORN** at



last year! “ **WOW!**” said . “ Are we there yet?”



“ Actually, ” chirped we are!” “ Look, there are the



Stiltinis! I wonder how **THEIR** trip from

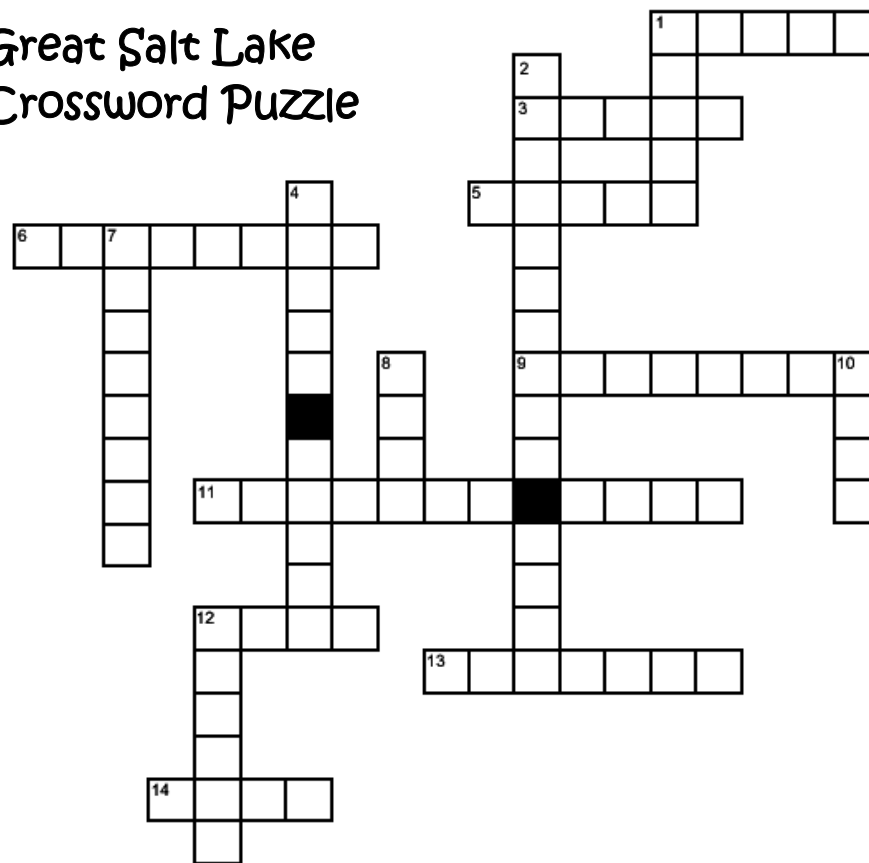


Mexico has been?” Then the **AVOCETIS** flew down to join the

Stiltinis for a feast! **—THE END**



Great Salt Lake Crossword Puzzle



Across

- Another name for American buffalo.
- What do Brine Shrimp eat?
- What stops over every year at GSL?
- Male brine shrimp have these on their head.
- A brine shrimp's first life stage.
- Tiny, pebble-like, round and smooth.
- Brine shrimp are harvested to feed these.
- The number of these varies depending on water level each year.
- Adult female brine shrimp have egg _____ to hold cysts and nauplii.

Down

- Birds have specially adapted _____ to eat different food.
- Utah state bird.
- They swarm in the millions, but don't bite.
- Name of the largest island in Great Salt Lake.
- Name of brine shrimp hard eggs.
- This is “harvested” using the sun's energy AND is used in cooking.
- The Great Salt Lake falls within the Pacific _____.

Brine Shrimp Life Cycle

Brine shrimp have a life cycle, just like all other living things!

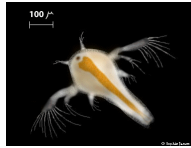
When brine shrimp are stressed out (they have no food, or it's getting very cold), they produce hard eggs called **cysts**.

CYSTS



The rest of the time they have live births. Once a baby brine shrimp is out of the egg sac or the cyst, it is called a **nauplius**.

NAUPLIUS



These grow up into juveniles with just a couple of legs (called **thoracopods**), which then grow into sub-adults (teenagers) with even more thoracopods. This is the life stage when you can usually tell if a shrimp is a boy or a girl.

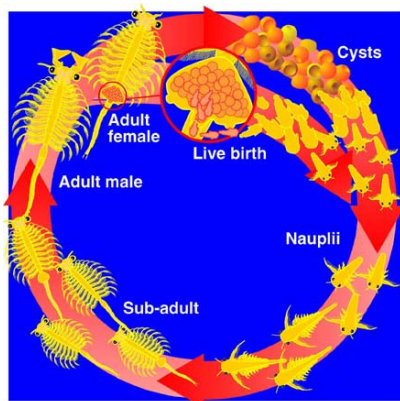
MALE



FEMALE



Females grow **egg sacs** to hold cysts and nauplii; males grow large **claspers** on the tops of their heads. By the time the brine shrimp are full-grown adults, the egg sacs and claspers are really easy to see. You might even be able to see cysts or nauplii in the female's egg sac!



How many shrimp with egg sacs can YOU count in this picture?

Females with egg sacs _____

Females with full egg sacs _____

GSL WORDSEARCH

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | l | p | h | t | b | i | r | d | s | r | o |
| k | e | e | b | p | i | a | d | a | e | e | f |
| a | u | l | e | m | u | e | e | e | a | r | a |
| l | f | i | s | i | l | s | e | a | g | l | a |
| t | e | c | l | r | i | l | v | a | u | l | a |
| l | r | a | y | h | t | o | y | o | l | o | p |
| a | d | n | a | s | c | i | t | i | l | o | o |
| s | n | t | t | e | t | c | m | r | i | e | l |
| t | a | e | t | n | a | u | p | l | i | u | s |
| a | t | l | m | i | g | r | a | t | i | o | n |
| e | s | o | t | r | a | m | a | l | e | e | g |
| r | e | p | l | b | s | e | g | a | a | r | p |
| g | r | e | v | o | l | p | l | s | m | r | e |

Words can be up, down, diagonal, backwards and can change directions. Words include:

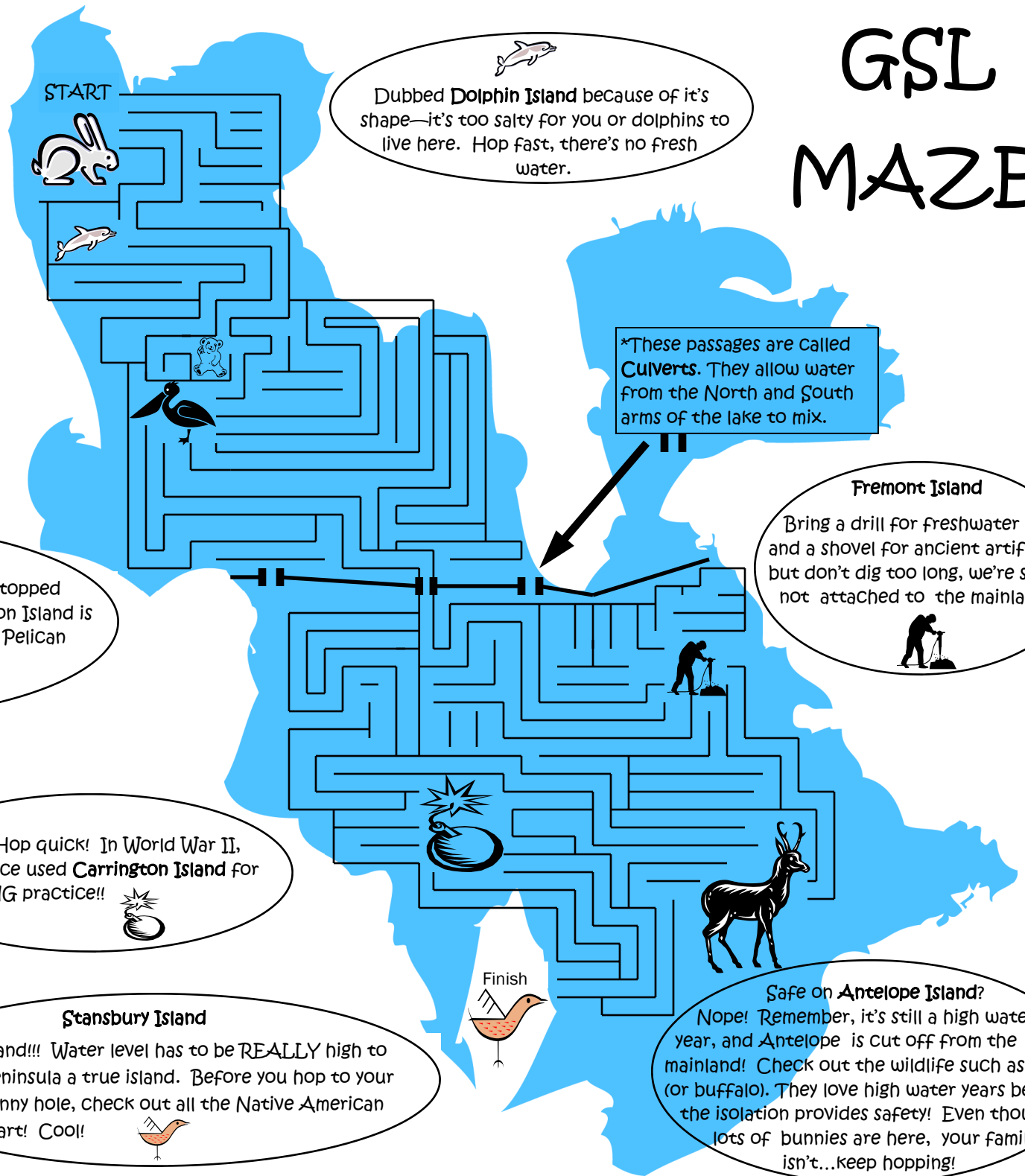
- | | | |
|--------------------|------------------|--------------|
| 1. Great Salt Lake | 2. Birds | 13. Nauplius |
| 3. Cyst | 4. Avocet | 14. Plover |
| 5. Antelope | 6. Oolitic Sand | 15. Algae |
| 7. Rest and Refuel | 8. Salt | |
| 9. Gull | 10. Brine Shrimp | |
| 11. Migration | 12. Pelican | |

Hop hop hop...



Bunny Hop **GSL ISLANDS** until you reach an island attached to the mainland and safety! Eleven islands are recognized on **GSL**, but the number fluctuates based on water levels every year. For this maze, it's a high water year, so only the biggest seven are poking their tops out!

GSL MAZE



Dolphin Island because of its shape—it's too salty for you or dolphins to live here. Hop fast, there's no fresh water.

Cub Island isn't connected to its mama (Gunnison Island) when the water level is so high.

Gunnison Island
Watch your step! Utah Guano Company stopped harvesting pelican guano in the 1890s. Gunnison Island is home to one of the largest American White Pelican breeding colonies in the world.

Fremont Island
Bring a drill for freshwater and a shovel for ancient artifacts, but don't dig too long, we're still not attached to the mainland.

Ahh!! Hop quick! In World War II, the air force used **Carrington Island** for **BOMBING** practice!!

Stansbury Island
The mainland!!! Water level has to be **REALLY** high to make this peninsula a true island. Before you hop to your family's bunny hole, check out all the Native American rock art! Cool!

Antelope Island?
Nope! Remember, it's still a high water year, and Antelope is cut off from the mainland! Check out the wildlife such as bison (or buffalo). They love high water years because the isolation provides safety! Even though lots of bunnies are here, your family isn't...keep hopping!

Fun Fact:
The bottom of Great Salt Lake and its beaches are made of **oolitic sand**, not ordinary sand. Oolitic sand is tiny, pebble-like, round and smooth, while regular sand is jagged. This sand forms as calcium and magnesium carbonate particles in the salty water of Great Salt Lake harden around brine shrimp droppings, quartz grains or other tiny debris in the water.