

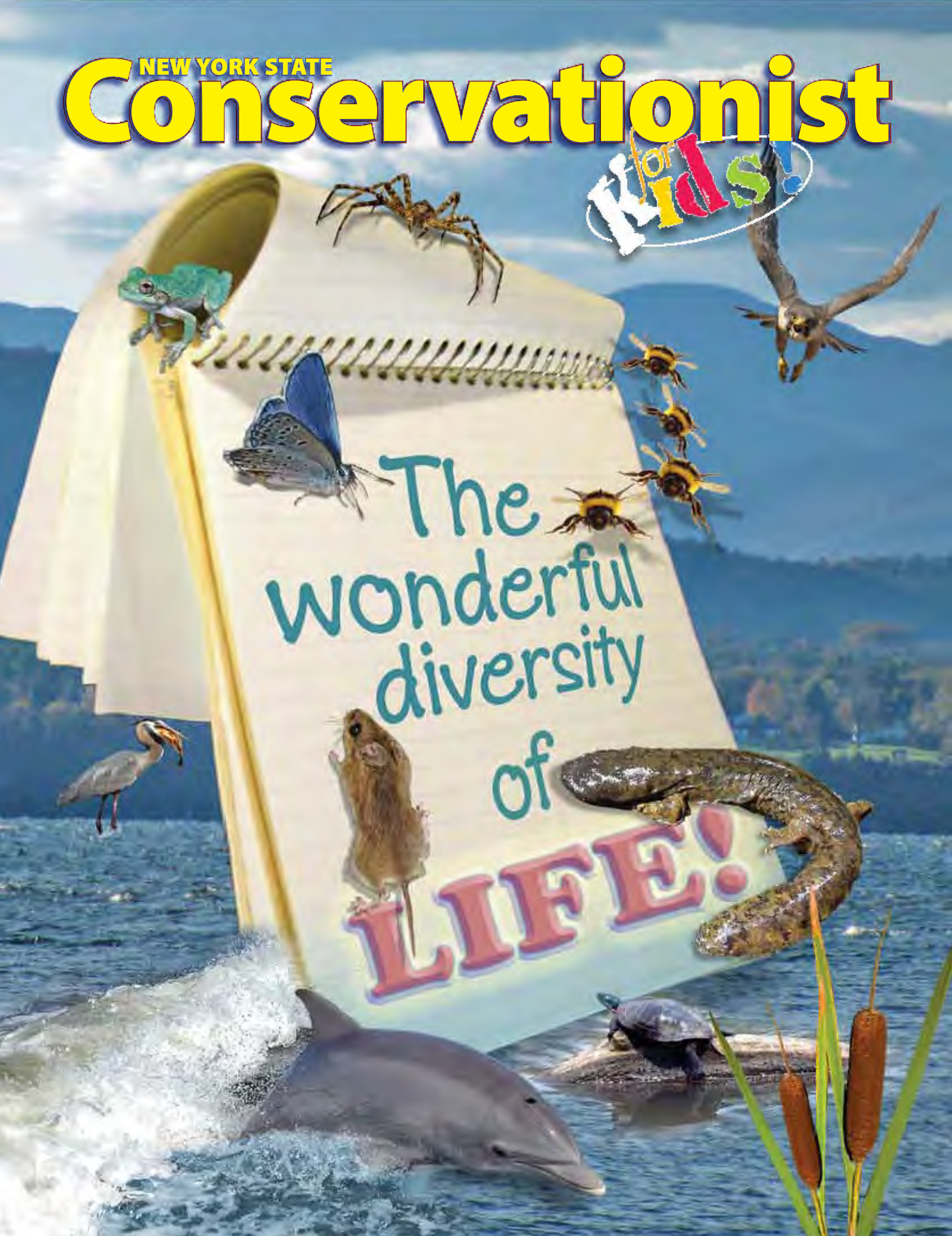
NEW YORK STATE

Conservationist

for
Kids!

The
wonderful
diversity
of

LIFE!



Welcome
to

NEW YORK STATE Conservationist

for
Kids!

Sue Shafer

In this issue:

New York State is home to many thousands of species of plants and animals. Each species plays an important role in the overall health of our natural environment.

Want to receive
Conservationist for Kids
at home? **Subscribe to
Conservationist magazine!**

You'll get six issues of the award-winning **Conservationist** magazine each year, plus **Conservationist for Kids** in the October, February and April issues. Call 1-800-678-6399 for information about how to subscribe.



Visit

www.dec.ny.gov for
information for kids interested in the
environment. Check out **Kids GO (Get
Outside)** for activity ideas, and look
for **Conservationist for Kids**
online.

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This issue of *Conservationist for Kids* is funded by Return a Gift to Wildlife. Donations to this program support fish and wildlife conservation in New York State, including education about conservation issues. Go to www.dec.ny.gov/animals/327.html for more information.

Clockwise, from twelve o'clock, the critters on this issue's cover are: dock spider, bumble bees, heron, karnar blue butterfly, gray treefrog, peregrine falcon, eastern hellbender, eastern painted turtle, bottlenose dolphin, deer mouse, great blue



**Do you like
to watch
animals
and explore
outdoors?**

We use natural resources for food and to make clothing, medicine, building materials and more. Plants produce oxygen, which we breathe. Wetlands buffer floodwaters and filter pollutants from water, making it safer for people and wildlife.

Biodiversity: (short for *biological diversity*) is the term used to describe the variety of life on Earth. It includes both living things and the natural processes that support them. Biodiversity is described at three levels: species, genetic and ecosystem.

US Fish and Wildlife Service



Species biodiversity refers to the millions of different kinds of plants, animals, fungi, microbes and other things that live on Earth. They interact with and depend upon each other for survival, such as in predator-prey relationships.

Genetic biodiversity describes the variations within a species. Just as you and your best friend are different, no two individuals of the same species are exactly alike. Differences in genes among individuals enable a species to adapt to changes in their environment, from generation to generation and from place to place.



Ecosystem biodiversity looks at the big picture and the interactions between organisms and their environment. It recognizes that different kinds of habitats ensure the needs of different animals are met for food, water, shelter and space. Species adapted to one habitat, like forests or wetlands, don't compete or survive well in habitats to which they are not well adapted. Transitional zones between habitats are suitable for some creatures from each habitat and are very diverse.

**Biodiversity
Bits (BB):**

Watch for bits of information about New York State's biodiversity throughout this issue of *Conservationist for Kids*.

Biodiversity is more than just a list of the plants, animals and other living organisms in an area.

Biodiversity recognizes that individual components interact with each other and with their surroundings. Soil provides a place for plants to grow, plants provide shelter and food for animals, and microbes decompose dead matter and return it to the soil, where it is available to plants once again.



Lena Aitner

Like the players on a sports team, each component in an ecosystem has a unique role to play.

In addition to food, there are other benefits (e.g., shelter) that components of an ecosystem provide for each other. Imagine a whole pond or forest and all the parts that function together. If one component disappeared or was reduced in number, many others would be affected. The more diverse an ecosystem, the better it copes with change.

CREATURE FEATURES



Jim Clayton

Peregrine falcon populations in New York State are recovered.

Peregrine falcon populations were in decline but have now recovered. The pesticide DDT was widely used in the US from the 1940s through the 1960s. It had the unwanted side effect of causing eggshells to become thin, especially among birds of prey. Fewer young hatched successfully, and peregrines nearly disappeared from New York State. Laws banning DDT and programs to raise and release peregrines have helped. Peregrines have adapted to urban life and now nest on tall buildings in our major cities, as well as in their natural habitat on cliffsides in rural and wilderness areas.



Karner blue butterflies are endangered.

Adult Karner blues feed on nectar from different kinds of flowers, but the caterpillars eat the leaves of wild blue lupine only. Mowing and prescribed fires (fires planned and monitored by professionals) keep lupine habitat from becoming overgrown with competing plants. Lupines are also planted in areas where they are likely to thrive. Supporting lupine habitat helps Karner blue butterflies. Species with very specialized needs, such as eating only one kind of food, are more at risk when the things they depend upon are lost.



NYS DEC Walley Haley

Hellbenders are getting a helping hand.



Jeff Humphries, Hellbenders.org

Hellbenders are large aquatic salamanders. They grow to more than two feet long. In New York State, hellbenders live in only the Allegheny and Susquehanna River drainages. They are sensitive to changes in their habitat, including pollution. DEC is working with the Buffalo and Bronx zoos to release captive-hatched and reared hellbenders into the wild. DEC also works with the New York State Department of Transportation, among others, to improve stream habitat for hellbenders.

BB:

New York State has the only known population of Chittenango ovate amber snails on the planet. We have a special responsibility to ensure this species' survival.



courtesy of Seneca Park Zoo

BB:

New York State is home to North America's largest and smallest mammals. Blue whales can be more than 100 feet long and weigh over 200 tons. Pygmy shrews are only 2 inches long and weigh less than an ounce!



THREATS TO BIODIVERSITY

Loss of habitat, unsustainable taking of animals and plants from the wild, competition with invasive species, disease, pollution and a changing climate all threaten biodiversity. Species may become reduced in number or even extinct. How much an individual species is affected depends upon how numerous and widespread it is. Species that are less common tend to be more vulnerable to change, and their populations are less able to adjust.

If an animal's habitat is reduced in size or quality, it may have problems finding everything it needs to survive. Human activities such as land development, pollution of air and water, use of some pesticides, and placement of roads affect the quality and size of habitat and an animal's ability to get around.

Invasive species are non-native organisms that cause problems in their new environment. Emerald ash borers (beetles native to Asia but accidentally brought into our area) kill ash trees. When ash trees die, animals which depend on them for food and shelter—including native insects, birds and mammals—are harmed. People use ash trees, too. Their wood is preferred for baseball bats.



David Cappaert, Michigan State University, Bugwood.org

laws for wildlife, The Migratory Bird Treaty Act, was passed. It protects all migratory birds from unregulated harvest. Biologists today work hard to ensure that harvest or collection of wild animals for food and other purposes is done sustainably.




In the late 1800s, ladies' hats adorned with feathers from snowy egrets were the height of fashion. Birds were killed just for their feathers. Egrets were on the brink of extinction until concerned individuals spoke up. In 1918, one of the first significant national conservation

BBB:


Seven species of dolphin are found in New York's marine waters.

CONSERVING BIODIVERSITY

BBB:


New York has more dragonfly and damselfly species (92) than any state except Texas.

Many people are involved in making decisions about the world around us and are acting to minimize threats to biodiversity. They are concerned about the health of different habitats and the living things that depend upon them, keeping them free of pollutants and able to support many kinds of animals and plants.

Helping Wildlife

Wildlife biologists work with species at risk of extinction to assist their recovery. In addition to improving habitat, these specialists may restore animals to suitable habitat and then monitor them while they become established.



Bald eagles on nest

US Fish and Wildlife Service

Researchers help improve our understanding of what kinds of animals and plants are around us and how the different components of ecosystems rely upon and interact with each other. Non-professionals help, too. Citizen scientists count wildlife, observe plants, record data, and share their findings with researchers. Landowners work with professionals to improve wildlife habitat on their properties.

Biologists use science to figure out how many animals can be taken from the wild, while ensuring healthy populations of species continue into the future. They use laws and regulations to ensure activities such as hunting, fishing, or other kinds of collection

are done in a sustainable manner. DEC staff protect populations of wildlife and plants by implementing the laws that regulate the use of fish, wildlife, and the habitats and resources they depend upon.

Helping Habitat

In New York State, DEC staff assist wildlife by managing and restoring habitat. For example, cutting trees to make room for new growth and allowing sunlight to reach the forest floor helps many kinds of plants and animals. Invasive plants and animals may be removed so they don't compete with native species for food, water, shelter and space.

Biologists use laws to protect certain habitats, like wetlands and streams, from actions that would damage them. Healthy habitats provide for people and for the animals and plants that use those areas. By conserving habitats, we conserve biodiversity.



Young forest habitat

DEC - Vicki Cross

For More Information

www.dec.ny.gov/animals/279.html DEC's Biodiversity and Species Conservation

www.dec.ny.gov/23.html DEC's fact sheets about animals, plants and aquatic life

www.dec.ny.gov/animals/57844.html DEC's New York Nature Explorer

<http://tv.hww.ca/video/watch/5> Canadian Wildlife Federation's "Discover Biodiversity" webisode

Tree of Life: The Incredible Biodiversity of Life on Earth, by Rochelle Strauss (Kids Can Press, Toronto, Canada, 2004)

You can do many things to protect biodiversity in your own neighborhood and around the world.

Be a responsible pet owner.

Learn how to care for your pets properly, including how to keep them safe from wildlife and how to keep wildlife safe from them. Keep your dog on a leash when you take it outside, and keep cats indoors. Free-ranging cats (feral and house pets) kill millions of birds, small mammals, reptiles and amphibians each year. Don't buy pets that were captured in the wild. Never release pets you no longer want. Find them a new home, or take them to an animal shelter instead.



Frank Knight

Become a citizen scientist. Monitor birds, insects, mammals, plants, weather and more, and contribute to real scientific research. Get started at www.birds.cornell.edu/citsci/ with the Cornell Lab of Ornithology.

Help restore natural habitat. Plant a garden, or help maintain a garden in your community for the benefit of local wildlife. Non-native plants can be invasive, so avoid using them. Groups like the Bronx River Alliance, Ducks Unlimited, Buffalo Niagara Riverkeeper and Trout Unlimited adopt bigger projects and restore natural habitat, among other activities, with the help of volunteers.



Learn how your choices affect biodiversity around the world.

The products we buy come from many different sources. Look for labels that tell you they are made from sustainably harvested materials. Whenever you can, buy products made locally, from local materials. By reducing your waste and your water use, you'll help conserve resources. By reducing your energy use, you'll help combat climate change and pollution. Even small efforts count!

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Joe Martens
Commissioner

Conservationist for Kids

Supplement for Classroom Teachers – Biodiversity

Biodiversity

New York State is rich in biodiversity. From wetlands to grasslands, farms to forests, open ocean to inland waters, multiple habitats support tens of thousands of species of animals, plants and other living things. At first glance, biodiversity seems pretty straightforward—the variety of life on Earth. Upon further investigation, we see that it is much more complex and involves not only an inventory of life, but also an acknowledgement of the relationships and interactions among different species, the places they call home, and the resources they depend upon for survival. Understanding biodiversity helps us understand broader issues relating to life on Earth and opens discussions related to endangered species and loss of habitat.

A simple demonstration may help you to illustrate biodiversity to your students. Using common toy blocks, have each student label one or two blocks with the name or photo of a different species of living thing. Include plants, animals, fungi, microbes, etc. Build a tower or pyramid with the blocks. (Species found in the same habitat could be stacked near each other to represent the relationships they have in nature.) Once the tower is complete, remove one block from anywhere in the structure. What happens? What do the students think will happen if more blocks are removed? Are some blocks more critical to the structure than others? Continue removing blocks until the tower falls. Try building the tower with just a few blocks versus building it with many blocks. Which is more stable? The more diverse a natural system is, the more stable it is. More diverse systems are better able to respond to change because they are less vulnerable.

This Issue's "Outside Page"

The activities on the Outside Page (page 8) of this issue of *Conservationist for Kids* demonstrate many ways students may influence biodiversity, both locally and globally. Use the activities described here to open discussions about how personal choices and actions do make a difference.

Teacher Workshops

For teachers who have participated in a Project WILD or Project Learning Tree workshop, the activities listed below complement the fall 2013 issue of *Conservationist for Kids*. Visit www.dec.ny.gov/education/1913.html for information about workshops and about how to obtain curriculum and activity guides.

Project WILD: Too Close for Comfort
Move Over Rover
Planting Animals
Rare Bird Eggs
Hazardous Links, Possible Solutions

Project Learning Tree: Picture This
Planet Diversity
Dynamic Duos
Web of Life
Life on the Edge

***Conservationist for Kids* and an accompanying teacher supplement are distributed to public school fourth-grade classes three times each school year (fall, winter and spring).** If you would like to be added to or removed from the distribution list, if your contact information needs to be changed, or if you have questions or comments, please e-mail the editor at cforkids@gw.dec.state.ny.us or call 518-402-8043.

Back issues of *Conservationist for Kids* magazine are available upon request. Go to our portal webpage at www.dec.ny.gov/education/40248.html to preview back issues online before requesting printed copies. From each issue's lead page, click on the "read the entire issue, cover to cover" link to access an eight-page PDF of the print version. To request printed copies (individual or bulk), e-mail the editor at cforkids@gw.dec.state.ny.us or call 518-402-8043.

Supplemental Activities for the Classroom

Become Citizen Scientists

Tap into your students' natural curiosity by participating in citizen science projects that encourage them to observe nature, maintain a nature journal, and record and submit data. The Cornell Lab of Ornithology has a number of different bird-related citizen science projects to choose from, including classroom activities through Project FeederWatch and Celebrate Urban Birds. All are described at www.birds.cornell.edu/citsci/. Students will learn about the many kinds of birds in their local area and contribute to ongoing research about bird populations. There are many other citizen science opportunities you can explore. See *Discover... Citizen Science* in the December 2011 issue of *Conservationist* magazine at www.dec.ny.gov/pubs/78429.html for more ideas.

Persuasive Writing

In small groups or as a class, investigate the story of Harriet Hemenway and Minna Hall, who started the groundswell of public awareness that resulted in passage of the Migratory Bird Treaty Act and formation of the National Audubon Society. Have your students write persuasive letters or create posters as though they were supporters of these two ladies, working to change fashion and attitudes in the late 1800s. (See the link to *Smithsonian* magazine, below, for background information.)

Investigate an Animal

In small groups or individually, have students choose a wild animal which lives in New York State and investigate it, creating posters or electronic slide shows to present their findings to classmates. Areas to investigate include: type of animal, food, predators, range, habitat, challenges to survival, and interesting factoids. To set the stage, study one animal as a class. Black bears are widespread across New York State, and a lot of information is available to share with students. Go to www.dec.ny.gov/animals/6960.html for DEC's black bear information. In addition, *Living with Black Bears* and *Understanding Black Bears* are available online at <http://blackbearinfo.com/> and include videos and multiple resources for teachers and students.

Do you have an interactive white board in your classroom?

If you use a SMART Board or similar interactive white board or projection system in your classroom, consider downloading a PDF of *Conservationist for Kids* and using it in your classroom, along with the printed copies enclosed in this mailing. This issue and all of our back issues are available at www.dec.ny.gov/education/40248.html.

Online Resources and Books

www.dec.ny.gov/animals/279.html DEC's Biodiversity and Species Conservation

www.dec.ny.gov/23.html DEC's fact sheets about animals, plants and aquatic life

www.dec.ny.gov/animals/57844.html DEC's New York Nature Explorer

www.dec.ny.gov/animals/29338.html New York Natural Heritage Program

www.amnh.org/our-research/center-for-biodiversity-conservation/publications/general-interest/living-with-biodiversity-series American Museum of Natural History – "Living with Biodiversity"

<http://tv.hww.ca/video/watch/5> Canadian Wildlife Federation's "Discover Biodiversity" webisode

www.cbd.int/doc/publications/cbd-sustain-en.pdf *Sustaining Life on Earth*, published by the Convention on Biological Diversity

<http://canadianbiodiversity.mcgill.ca/english/index.htm> Canadian Biodiversity Website

www.smithsonianmag.com/science-nature/How-Two-Women-Ended-the-Deadly-Feather-Trade-192135981.html

"How Two Women Ended the Deadly Feather Trade" by William Souder, *Smithsonian* magazine, March 2013

The Atlas of Endangered Species, edited by John Burton (Macmillan Publishing Company, New York, 1991)

Discovering Endangered Species: A Nature Activity Book, by Nancy Field and Sally Machlis (Dog-Eared Publications, Middleton, WI, 2008)

The Eagles are Back, by Jean Craighead George (Penguin Books, New York, 2013)

Legacy: Conserving New York State's Biodiversity, edited by E.A. Johnson and D. Smith (American Museum of Natural History, New York State Biodiversity Research Institute, New York State Department of Environmental Conservation, New York Natural Heritage Program and The Nature Conservancy, Albany, NY, 2006); available online at www.nysm.nysed.gov/bri/pdf/nys_legacy_biodiversity_book.pdf

Tree of Life: The Incredible Biodiversity of Life on Earth, by Rochelle Strauss (Kids Can Press, Toronto, Canada, 2004)