# Species Rescue Lab: NYSSLS Alignment

Teacher guide for the student worksheet at mrsajdak.com/rescue (two pages, 18 questions; a low-write version has the same numbering). Environmental Science, Chapter 7, Lesson 7.3: How Can We Sustain Wild Species and Ecosystem Services? (SE pp. 231-238). The answer key is a separate file, kept off the public site.

## Performance expectations

> **HS-LS2-7**
> Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. *"The heart of the lab: students test four plans for the Great Lakes piping plover in a model, then weigh them against ranked criteria and a constraint (Q13 to Q18)."*

> **HS-LS4-5**
> Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. *"Part 1: real counts show protection changing conditions and three species increasing again."*

> **HS-ESS3-3**
> Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. *"Building toward it: students run and critique a simple management model (Model check, Q11) and work out cost per pair (Q12)."*

## Practices and concepts, where students do them

| Practice or concept | Questions | What students do |
|---|---|---|
| **SEP 4 Analyzing and Interpreting Data** | 1, 3, 10 | Read real counts for the whooping crane, California condor and piping plover; real 2024 condor births, deaths and releases. |
| **SEP 5 Using Mathematics and Computational Thinking** | 2, 10, 12 | Latest divided by lowest; births minus deaths; cost per pair added. |
| **SEP 2 Developing and Using Models** | 7 to 9, 11 | Run four plans for 20 years; match parts of the model to births, deaths and carrying capacity; name what it leaves out. |
| **SEP 6 Designing Solutions** | 13 to 17 | Score plans in a decision matrix with ranked criteria and a must-have constraint. |
| **SEP 7 Engaging in Argument from Evidence** | 18 | Fund one plan with a claim, two numbers, a top criterion and a trade-off. |
| **CCC Stability and Change** | 8 to 10, 16 | Which plans let the plover hold steady, shrink or grow; a wild flock that only grows because people add birds. |

## Opening: pick a phenomenon

The slideshow's first slides offer three openers. Pick one per class. The 7.1 lab opened with bees and 7.2 with HIPPCO, so nothing here repeats them.

| Opener | What happens | Notes |
|---|---|---|
| **Video: A Puppet and a Costume** | AP: a two-day-old California condor chick fed with a puppet (0:45). Then Nat Geo Animals, Raising Baby Whoopers (2:49). Backup: ZooBorns, Audubon staff in crane costumes. | Clips were checked to embed; start and stop times were not watched end to end. Preview on the school network. Do not explain imprinting yet; the Do Now asks why a puppet. |
| **Activity: Ten Coins, Four Species** | 4 minutes. Pairs spend ten coins ($1 million each) on a crane, a condor, a plover and Pitcher's thistle, a Great Lakes dune plant. | Needs ten coins or beans and one strip per pair. List pairs' reasons on the |

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|---|---|---|
| | | board: those are criteria for Part 3. The plant usually gets the least. |
| **Photos: Raised by Hand** | A condor chick fed by a puppet, and crane chicks led by a person in a costume. | Ask: why hide from the bird you are saving? |

## Part by part

**Do Now.** A puppet feeds a condor chick: why? Answer: so the chick does not get used to people.

**Part 1, Comebacks (Tab 1).** Explore: Q1 to Q3 (each bird's lowest and latest count, and what people did first). Learn It on the toolbox (ESA, CITES, CBD, refuges, seed banks, botanical gardens and arboretums, egg pulling, captive breeding) sits between Q3 and Q4. Apply: Q4 to Q6.

**Part 2, Test the tools (Tab 2).** Explore: Q7 to Q9 (run Plans A to D for the plover). Learn It on births, deaths and carrying capacity sits between Q9 and Q10. Apply: Q10 to Q12. The Model check is Q11.

**Part 3, Weigh the plans (Tab 3).** Explore: Q13 and Q14 (two rankings give two winners). Learn It on criteria, constraints and trade-offs, and the book's "one species or the whole ecosystem" question, sits between Q14 and Q15. Apply: Q15 to Q17. Q18 closes the lab with a funding argument.

**About the model.** Tab 2 is a teaching model with round numbers, not a forecast. Each year 3 in 4 adults live and 1 in 3 chicks lives to breed. Each pair raises 0.7 chicks with no help, 1.4 with fenced nests and 1.6 with fences and protected beaches. Nesting room caps the flock at 110 pairs (250 with protected beaches). Salvaged eggs add 24 young a year; a zoo flock adds 40, but only 1 in 6 zoo birds lives to breed. It has no randomness, so every student sees the same numbers. The 2026 start (99 pairs) and the 150-pair goal are real.

## The district section

BPS Environmental Science Unit 3, Lesson 7.3. This lab serves the section's core ideas (treaties and laws that protect species; refuges and other protected lands; seed banks; captive breeding) and all of its vocabulary (CITES, CBD, ESA, seed bank, botanical garden, arboretum, egg pulling, captive breeding). From the district list it uses Ready To Go: Endangered Species Act (p. 232), the Misconception on protecting species (p. 232; Q16), Tech It Out: National Wildlife Refuges (p. 234; the crane's refuge) and Social Factors on economics, politics and ethics (p. 236; Q12 and Q17). **Additions, beyond the district list:** the condor puppet and crane costume videos, the plover model and decision matrix, and the hands-on Conservation Council. **Substitution:** the district's MindTap video "Emerging Explorer: Krithi Karanth" is not reachable outside MindTap, so the direct instruction deck uses a short public clip about her work instead.

**Sources.** Whooping crane: International Crane Foundation counts of the Aransas-Wood Buffalo flock (1938 to 2014) and U.S. Fish and Wildlife Service winter survey estimates (2015 to 2025). California condor: U.S. Fish and Wildlife Service (27 birds in April 1987, when the last wild bird was caught) and the California Condor Recovery Program 2024 population report (566 birds; 2024 wild hatches, deaths and releases). Great Lakes piping plover: Great Lakes Piping Plover Recovery Effort and USFWS recovery plan (12 pairs in 1990; 99 pairs in 2026; recovery goal 150 pairs). Environmental Science (National Geographic Learning / Cengage), Lesson 7.3. Images are listed on the lab page.