

Questions 38–47 are based on the following passage.

This passage is from John Carey, "Architects of the Swamp."
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Joy Zedler carefully planned three experimental wetlands at the University of Wisconsin–Madison's Arboretum to be identical: parallel marshes 295 feet
Line long and 15 feet wide, carved by engineers into the
5 green landscape. Zedler's contractors planted all three tracts with similar species to see how the vegetation would absorb and clean water runoff during storms.

Zedler's team also allowed the same amount of
10 water to flow into the test beds from a pond at the front ends of the tracts. They planned to measure the nutrients in the water entering each plot and draining into a basin at the far end, as well as soil stability, water absorption, and the productivity and
15 diversity of the grasses and other plants. The scientists expected that each of the three wetlands would behave similarly.

The stakes were higher than for the typical university project. The city of Madison was
20 keenly interested because it wanted to learn how to use wetlands to slow and cleanse storm water pouring out of town into neighboring Lake Wingra, which is suffering from high levels of nutrients such as nitrogen and phosphorus in the runoff. And the
25 question of how to maximize the many valuable so-called ecosystem services that wetlands can provide, from reducing runoff and flood damage to boosting biodiversity, has been growing more urgent by the year as wetlands worldwide vanish at an
30 alarming rate. Zedler, a professor of botany and restoration ecology at the university, had hoped the experiment would provide some insight.

Three years later, however, it was clear that the experiment had raised new questions the researchers
35 had not anticipated. "Nothing about the system behaved as we supposed," Zedler says. The first surprise: even though the tracts were just three feet apart and had been planted and expected to develop similarly, one plot became dominated by cattails,
40 whereas the other two blossomed with up to 29 plant species. Second, although the cattail plot produced more plant material overall, it was lousy at everything Zedler expected from lush growth. It did

not slow floodwater or control soil erosion. It did not
45 absorb much of the nutrients in the water. The other two tracts provided more of the expected benefits—except for high productivity.

Why the surprising differences? Zedler's team discovered that a layer of clay under the cattail marsh
50 was slightly thicker and thus less permeable than the layer under the two adjacent plots—so water ponded instead of percolating into the ground. That allowed storm water and nutrients to race down the channel. Meanwhile the cattails shaded out soil-stabilizing
55 moss—which grew well in the neighboring swales—so soil erosion was higher.

Zedler's unforeseen results are helping her and other experts explain why the track record of past restoration efforts is poor, and they are pointing the
60 way to improving the success rate. The big lesson from multiple investigations is to forget about trying to re-create a fully functioning wetland that is identical to the one being lost. "We don't know how to do it," says Doug Wilcox, professor of wetland
65 science at the College at Brockport, S.U.N.Y. There are too many variables.

Instead scientists should focus on one or two key objectives, such as rebuilding land, improving water quality or boosting fish populations, and engineer
70 the system to optimize those objectives. Then, once the basic engineering is done, let nature fill in the details as it pleases.

Another lesson is to monitor wetland projects for years, as Zedler continues to do with her experiment.
75 That time is needed to uncover the often surprising details of what works and why and to take corrective action when necessary.

38

Which choice best states the central claim in the passage?

- A) The environmental benefits of re-created wetlands are often underestimated.
- B) Runoff and soil erosion make wetland preservation an urgent priority.
- C) Wetland restoration is best accomplished with limited goals in mind.
- D) Wetlands should be restored only after many years of careful observation.

39

Over the course of the passage, the main focus shifts from

- A) describing an experiment to challenging the results of that experiment.
- B) summarizing a research study to discussing lessons from the study.
- C) explaining a scientist's tentative findings to questioning the interpretation of those findings.
- D) discussing a theory to detailing the difficulties encountered in testing the theory.

40

The first two paragraphs (lines 1-17) serve mainly to

- A) illustrate Zedler's experience with wetlands.
- B) underscore the collaborative nature of Zedler's work in the field of wetland preservation.
- C) explain Zedler's theory about wetland restoration.
- D) describe the design specifications and planning that went into Zedler's wetland tracts.

41

It can reasonably be inferred from the passage that certain nutrients essential for plant growth

- A) are lacking in soil in which cattails are grown.
- B) increase the number of plants but decrease the variety of plants found in wetlands.
- C) can be detrimental in high concentrations to the overall ecology of lakes.
- D) will not be present in a plot if the plot lacks proper drainage.

42

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 11-15 ("They . . . plants")
- B) Lines 15-17 ("The scientists . . . similarly")
- C) Lines 19-24 ("The city . . . runoff")
- D) Lines 44-45 ("It did . . . water")

43

As used in line 34, "raised" most nearly means

- A) provoked.
- B) cultivated.
- C) collected.
- D) increased.

44

The author states that two of the three experimental wetlands shared which of the following characteristics in comparison with the third?

- A) Less water absorption
- B) Less soil retention
- C) Less total plant mass
- D) Less absorption of nitrogen and phosphorus

45

The passage suggests that one plot became “dominated by cattails” (line 39) because, compared with the other two plots, it

- A) was planted with the seeds of fewer plant species.
- B) had a more substantial clay base.
- C) accumulated a smaller amount of moss.
- D) received more water in the form of runoff.

46

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 41-43 (“Second . . . growth”)
- B) Lines 45-47 (“The other . . . productivity”)
- C) Lines 48-52 (“Zedler’s . . . ground”)
- D) Lines 54-56 (“Meanwhile . . . higher”)

47

As used in line 59, “poor” most nearly means

- A) needy.
- B) unfertile.
- C) petty.
- D) unsatisfactory.

STOP

**If you finish before time is called, you may check your work on this section only.
Do not turn to any other section.**