

Monarch Butterfly Population Monitoring

Method: Students will make a bar graph of the Monarch Butterfly population

Objectives: Students will learn about long-term population monitoring

Background

The Monarch Butterfly is a familiar butterfly to most people. It's large size (nearly 4 inches) and beautiful orange, black and white colors make it easy to identify. The migration of Monarchs is one of the most spectacular, and mysterious, feats of any wild animal.

The eastern population of Monarchs leave their winter roost in Mexico during the middle of March. They fly north to Texas and other southern states where they mate and females lay eggs on milkweed plants, usually a single egg per plant. During her life a female will lay 100 to 300 eggs. Eggs hatch in about four days and the Monarch larvae go through five instars (caterpillar stages) as they grow for 10-14 days. The larvae then transform into a chrysalis and the tissues reorganize into a butterfly. After 10-14 days, the adult Monarch emerges. This 1st generation of adults produced from the overwintering Monarchs migrate northward to the Corn Belt states and some into North Dakota. These 1st generation adults complete a life cycle and a 2nd and 3rd generation are produced. Lastly, a 4th generation is produced and these adults (along with some late 3rd generation) enter a state of reproductive diapause and these are the generations that migrate south in September through November to the overwintering sites in central Mexico. North Dakota produces mostly 3rd and 4th generation Monarchs.

Recently, there has been concern that Monarchs are declining. They may even be listed as an endangered species. There are several potential causes of the declining population: 1) loss of breeding habitat throughout the United States (i.e. destruction of milkweed plants); 2) loss of overwintering habitat in Mexico (i.e. illegal logging); 3) pesticides; 4) predation, disease and other natural enemies; or 5) climate change (i.e. changes the monarch migration or breeding range).

Since all the eastern population of Monarchs overwinter in a small area in Mexico, biologists are able to count and estimate the population size. The Monarchs congregate in large masses on oyamel fir trees. The population must be at least 225 million Monarchs over the long term otherwise this butterfly may become endangered or even extinct. In North Dakota, conservation actions such as planting milkweed gardens and using less pesticides can help Monarchs.

Procedure

Create a bar graph of the Monarch population over time.

Year (X-axis)	Population (Y-axis)
1994-1995	391 million
1995-1996	631 million
1996-1997	910 million
1997-1998	289 million
1998-1999	278 million
1999-2000	449 million
2000-2001	142 million
2001-2002	468 million
2002-2003	377 million
2003-2004	556 million
2004-2005	110 million
2005-2006	296 million
2006-2007	334 million
2007-2008	231 million
2008-2009	253 million
2009-2010	96 million
2010-2011	201 million
2011-2012	145 million
2012-2013	60 million
2013-2014	34 million
2014-2015	57 million
2015-2016	201 million

Assessment

1. Overall, is the population declining, increasing or staying the same?
2. What factors affect the Monarch population?
3. How can you help the Monarch in North Dakota?