Initially, installation of bat houses was met with low occupancy and acceptance by bats (Harvey et al. 1999), but more recent designs and experiments have revealed that if constructed properly, odds of success exceed 80% (Tuttle 2005). Europeans and Americans place bat houses in their yards to take advantage of bats' insectivorous diets, using bats to biologically control bugs around the home (Harvey et al. 1999). Development of species' specific bat house needs is on the forefront of current research, and hundreds of new bat houses and other artificial roosts are tested each year through the Bat House Project (Tuttle 2005).

Artificial roosts were manufactured during the winter and spring of 2011. Rough sawn pine lumber measuring 1" thick was used for the construction of the **EuroBox, BCI Box,** and the 2-chamber **RocketBox**. All houses were caulked, and the external portions were stained with two coats of Sikkens™ water-repellant wood finish for exterior wood. The **RocketBox** roofs were tarred and shingled for additional moisture protection. Each of these three designs were erected at 27 locations throughout the State.

The **EuroBox** chamber measured 8" wide, 10" tall, and 7" deep and is a single-chamber design. The bottom of the **EuroBox** is closed except for a ¾" gap near the back plate. The bottom can be removed for maintenance and cleaning of the house. https://thumbs-media.smithsonianmag.com/filer/f5/8d/f58dc992-c395-4998-9de8-f86bfb0d1a21/bat_house_1_courtesy_esporao.jpg__600x0_q85_upscale.jpg

The **BCI Bo**x chamber measured 12" wide, 10" tall, and 3" deep, with partitions creating 3, ¾" chambers. The bottom portion of the **BCI box** is open.

The exterior shell of the **RocketBox** measures 13" by 13" by 36"; the inner shell measures 9" by 9" by 36"; and the pole sleeve measures 5" by 5" by 40".

Mounting of the boxes- The **Eurobox** and **BCI box** were easy attached to buildings, trees, snags, and decommissioned light and electrical poles. However, the mounting must be very stable. The **RocketBox** was free-standing and secured to a 21-foot-long steel pipe buried approximately 5 feet in the ground.

The **RocketBox** was the preferred roost for our cavity roosting bat species. The **RocketBox** provides a continuum in temperatures due to the temperature difference from the outer shell to the inner shell and moving vertically towards the superior end of the box. As it is free-standing, the **RocketBox** will always have a side facing the sun, and a side in the shade. The continuation of the chambers around the perimeter of the inner and outer shells allows a bat to relocate within the house depending on its current temperature requirements. A pregnant or lactating female can stay in the warmer portion of the house to conserve energy, while a solitary male can move towards the periphery or into an outer shell. Whereas the **RocketBox** is easier to build, it difficult to install. The expense of the pipe is also a deterrent.

The **Eurobox** and **BCI Box** designs were less successful in terms of occupancy. Of these two, the **Eurobox** is easier to build, but does not provide the necessary temperature gradients utilized by bats of different genders and in different reproductive stages. Because of its' enclosed floor design, it was prone to occupation by hornets.

The **BCI box** provides cavities and temperature differences that can be utilized by both solitary males and pregnant or lactating females alike. In terms of ease of installation and probability of occupancy, this house should be the most widely promoted design for the average person wishing to increase their backyard wildlife.

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https://gfp.sd.gov/wildlife/docs/bat-managment-plan.pdf

Common Name	Scientific Name	In-State Range	Type
Red bat	*Lasiurus borealis borealis*	Statewide	Summer resident
Hoary bat	*Lasiurus cinereus cinereus*	Statewide	Summer resident
Silver-haired bat	*Lasionycteris noctivagans*	Statewide	Summer resident
Northern long-eared Myotis	*Myotis septentrionalis*	Statewide	Year-round resident
Little brown Myotis	*Myotis lucifugus lucifugus/carissima*	Statewide	Year-round resident
Western small-footed bat	*Myotis ciliolabrum*	Statewide	Year-round resident
Black Hills Fringed Myotis	*Myotis thysanodes pahasapensis*	West River	Year-round resident
Western long-eared Myotis	*Myotis evotis evotis*	West River	Year-round resident
Long-legged Myotis	*Myotis volans interior*	West River	Year-round resident
Big brown bat	*Eptesicus fuscus fuscus/pallidus*	Statewide	Year-round resident
Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	West River	Year-round resident
Evening bat	*Nycticeius humeralis humeralis*	East River	Migratory
Eastern pipistrelle	*Perimyotis subflavus subflavus*	Statewide	Year-round resident

Swier 2003, Swier et al. 2006, SDBWG 2012.

All three house designs being installed in Meadow, SD.

Eurobox and **BCI box** in Meadow, SD.

Eurobox and **BCI box** at Angostura Recreation Area.