

## Chart 1: Peregrine Falcons at Great Spirit Bluff, 2005 – 2019

*The chart below shows Peregrine Falcon production at Great Spirit Bluff between 2005 and 2019. Until 2012, production is listed in the following order: eggs laid, eggs hatched, falcons banded. After 2012, production is listed as eggs laid, eggs hatched, falcons fledged.*

*2012 was the first year we could watch Great Spirit Bluff online. Blackfly years – i.e., years where blackflies caused early fledging – are highlighted in green.*

*To watch and learn more about the Great Spirit Bluff falcons and their home, go to <https://www.raptorresource.org/birdcams/gsb-falcons/>*

Year	Male	Female	Production
2005	Unknown	Katrinka	4   4   4
2006	Unknown	Katrinka	4   3   3
2007	Unknown	Unknown	4   3   3
2008	Unknown	Unknown	1 falcon banded
2009	Unknown	Unknown	4   4   4
2010	Unknown	Unknown	4   4   4
2011	Travis	Michelle	4   4   4
2012	Travis	Michelle	4   3   2
2013	Travis	Michelle	4   4   2
2014	Travis	Michelle	5   1   1
2015	Travis	Michelle	4   4   4
2016	Newman	Michelle	4   4   4
2017	Newman	Michelle	4   4   2
2018	Newman	Michelle	4   2   2
2019	Newman	Michelle	4   2   1

## The ins and outs of controlling blackflies at our sites

To control blackflies, we need to know what kind of blackflies we're dealing with. Some flies are generalists, while others are specialists. Some species have one generation per year, while others have several. We contacted blackfly expert Dr. Peter Adler and will send him any flies we collect from Peregrine falcons. We've also asked regional rehabbers to send him any black flies that come in on their birds and will probably set up dry ice traps near our nests next spring.

### Controlling black flies after hatch

Control strategies can be generally grouped into two categories – controlling black flies after hatch and preventing hatch altogether. To control flies after hatch, RRP Director John Howe installed a fan at Great Spirit Bluff and Neil Rettig installed a fan in the Wisconsin kestrel nest. Veterinarian Dr. Laura Johnson also applied Endure, a permethrin-based repellent, on the outside of the kestrel nestbox (although not the kestrels themselves). The combination of a high-powered fan with an insect repellent did a very good job at keeping blackflies out of the kestrel nestbox. Endure can last up to two weeks and is applied locally, making it a very good candidate for use at our nest boxes.

The two Decorah eagle nests are a little tougher to deal with. We can't access them without shooting a line, which puts the eagles at risk. Most products we apply during cam work in September will be gone by next May (this includes vanilla and cedar oils, which we tried unsuccessfully at Great Spirit Bluff in 2017). Insecticidal paints last longer, but they aren't proven to work against blackflies and can't be allowed to enter or run off into storm drains, drainage ditches, gutters or surface waters. They are extremely toxic to fish and invertebrates, which makes us hesitant to use them. We haven't given up on a post-hatch control strategy, but the difficulty of reaching the nests without hurting the eaglets makes it a lot harder.

### Preventing blackfly hatch

How about preventing blackfly hatch? BTI, or *Bacillus thuringiensis israelensis*, produces toxins that are effective in killing various species of mosquitoes, fungus gnats, and blackflies. It is believed not to have an effect on non-target organisms, although questions remain about the consequences of wiping out a large number of invertebrates in any given natural system.

BTI is widely used in urban blackfly control, but has it been used to control ornithophilic blackflies in rural settings? It has! Researchers used BTI to control the blackfly population at the Necedah National Wildlife Refuge between 2010 and 2012 as part of a wider study investigating reproductive failure in reintroduced whooping cranes. They found that treating flowing water with BTI helped suppress blackfly hatch, although it isn't as simple as dumping BTI into every trickle, stream, and river. Researchers have to identify blackfly species and sources to control them effectively and BTI gets washed away if water is flowing high and fast.

We're currently talking with professor Peter Adler, a blackfly specialist, and others who participated in the Wisconsin study to determine whether BTI could be used safely and effectively near our nests. If we decide to go the BTI route, we'll be talking with landowners, the Iowa DNR, the City of Decorah, and raptor and black fly researchers. Any projects would need to be properly permitted and formally documented to determine their success. As an

environmental organization, we need to look for solutions that balance the health of the birds we watch with the health of the environment that surrounds and nourishes them.

In short: this problem doesn't appear to be going away and may become more common in the future as the effects of global climate change deepen. We're working on a solution that is safe for our birds, minimizes environmental impact, and can be documented and shared with others who are facing the same problem.

*We've had a lot of followers suggest cedar oil, vanilla, and other homeopathic remedies. We've tried vanilla and cedar oils at GSB, but they volatilize or wash away too quickly to provide control throughout the season. This isn't a bad thing – DDT still remains a problem in some places 47 years after it was banned in the United States in part because it doesn't break down – but it means they aren't a good option for black fly control at our Bald Eagle nests.*