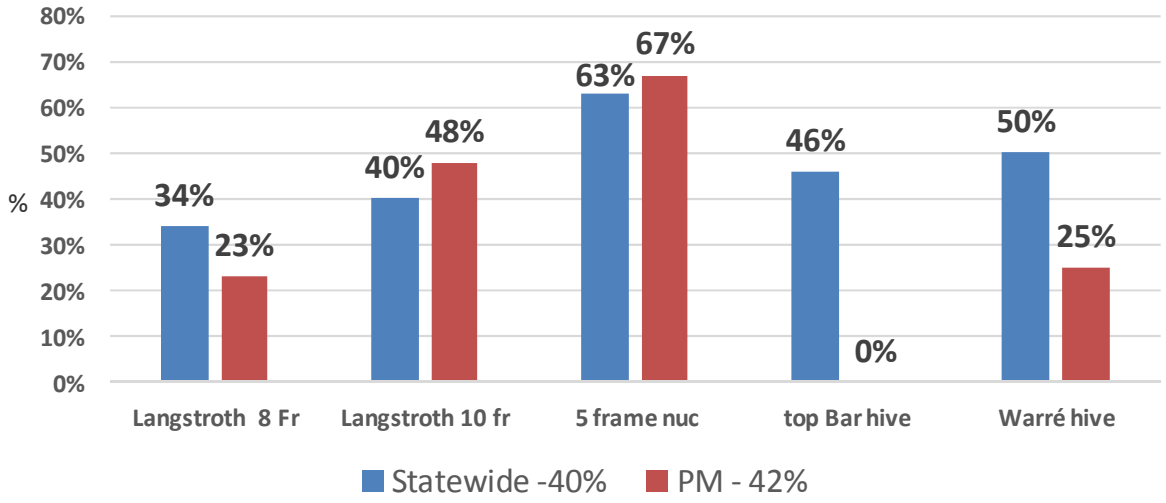
## **2015 Portland Metro Winter Loss** by Dewey M. Caron and Jenai Fitzpatrick

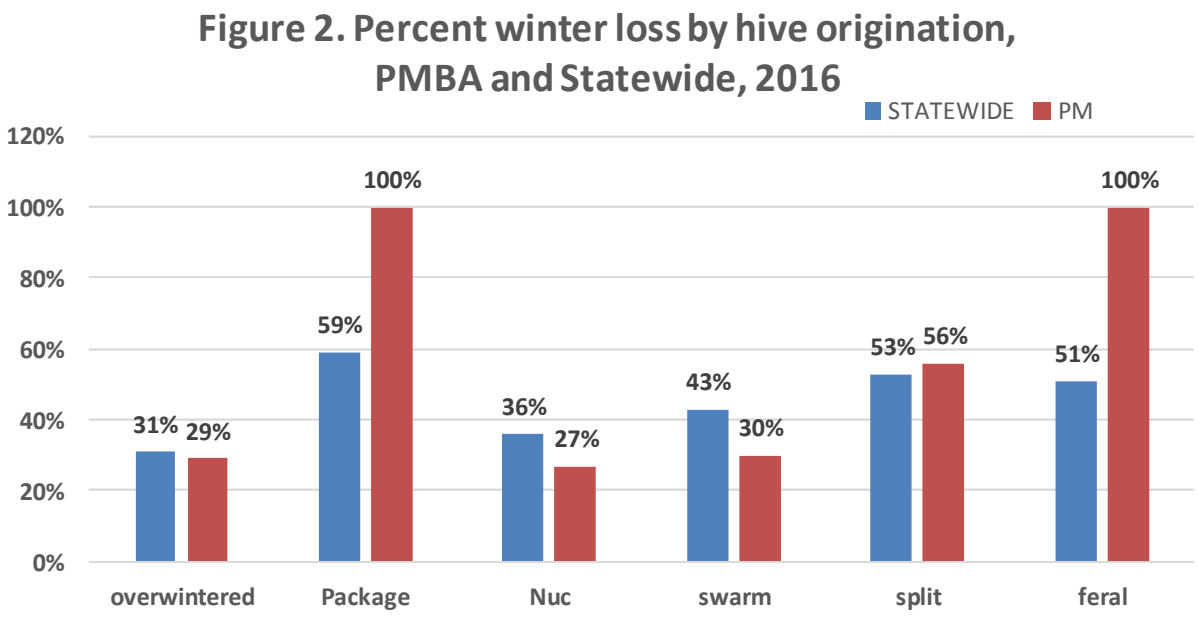
At the April meeting members were directed to a web-based survey document in our continuing effort to define overwintering success. This was the 8th year of such survey activity. I received 249 responses from Oregon (OR) backyarders, an additional 52 from Washington beekeepers keeping anywhere from 1 to 43 colonies; Portland Metro (PM) members sent in 23 surveys, three more than last year's survey. PM colony number in this year's survey was 144, almost double of last year.

Overwintering losses of PM respondents was 17 colonies = 42%, 2 percentage point high than the statewide loss of 40% (database of 249 OR backyarders.) Percent losses, determined for 6 hive types, is shown in Figure 1 comparing PM with the statewide backyarders. PM member respondents started winter with 109 Langstroth 10-frame and 24 Langstroth 8-frame hives (ZZ% of total), 6 5-frame nucs and 1 Top bar hive, which survived winter and 4 Warré hives, of which three survived. Loss of Langstroth hives (15%) was ½ that of statewide beekeepers, the single nuc did not survive and 5 of the 6 Top bar hives were lost.

**Figure 1. Percent loss comparison PM with statewide backyarder losses, 2016**




The survey also asked for hive loss by hive origination. Thirty of 42 overwintered PM colonies were alive in the spring (29% loss rate), two percentage points different from statewide. PM respondents reported loss of all seven installed packages and both of the feral transfers. Nuc, swarm and split losses were similar to other OR beekeepers, see Figure 2.




Losses this past winter for PM beekeepers , based on the 25 survey respondents, were double the losses last but 20 percentage points lower compared to the terribly elevated losses of the previous winter (62%) (see [www.pnwhoneybeesurvey.com](http://www.pnwhoneybeesurvey.com) for last year's report) for PM beekeepers and statewide (last year 48% statewide).

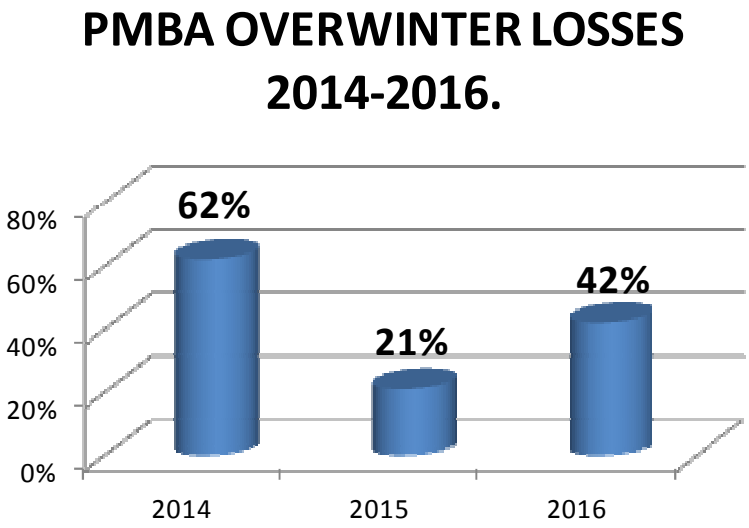
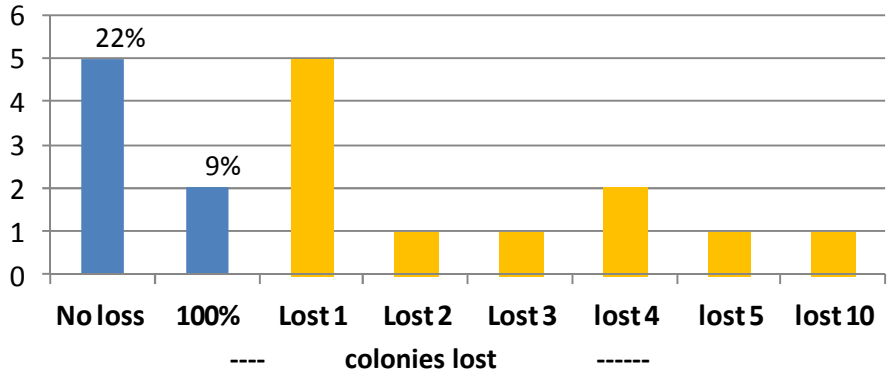



**Figure 3**

Not everyone had loss. Five individuals (22%) reported total winter survival; two individuals lost 100% of their colonies. Five individuals lost 1 colony with heaviest loss of 10 colonies. Data is shown graphically below in Figure 3. Seventy-two percent indicated acceptable overwinter loss as zero or 5-15%.

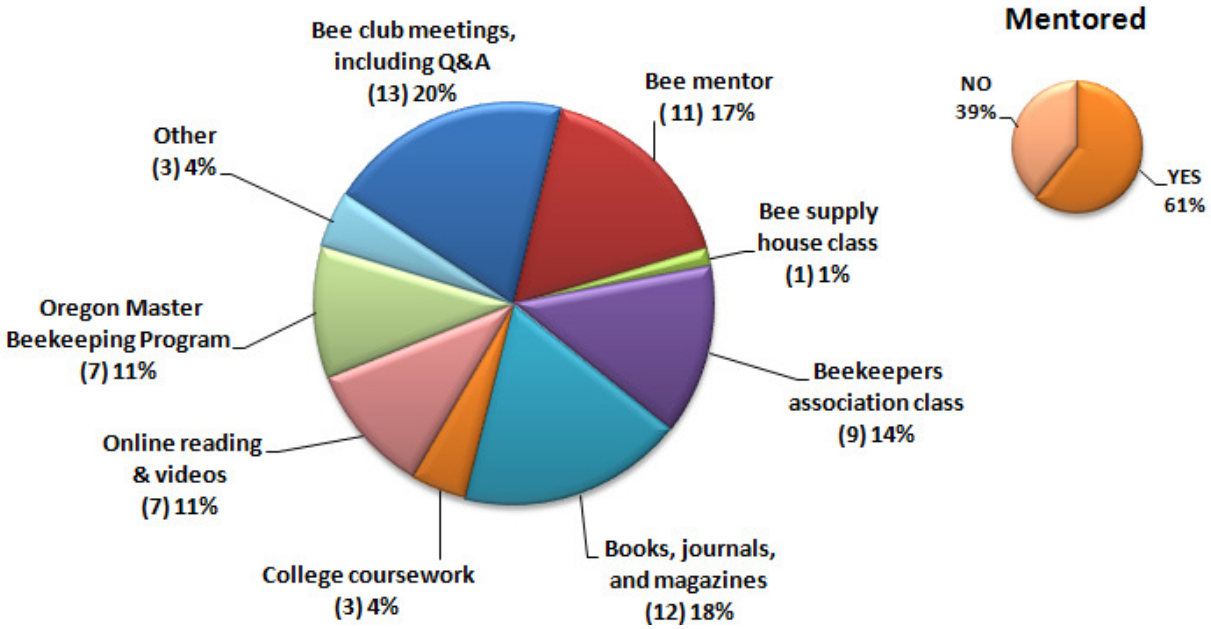
**Figure 4. 2016 PM individual loss, hive ownership**




Two PM respondents had 1 colony, 4 had 2 and 3 colonies each (43% had 1, 2 or 3 colonies), while four individuals had 8 or more colonies (17%); the largest number was 25. All individuals had but a single apiary, one moved colonies 100 yards to consolidate. All individuals had two or more years of beekeeping experience; 9 had 2 or 3 years (39%) and 4 had 8 or more years experience with 19 years the greatest.

When asked to indicate where the majority of their beekeeping education was received, thirteen PM respondents listed Bee club meetings followed by Books, magazines and Bee Mentor/OR Master Beekeeper program. Fourteen (61%) respondents said they had a mentor available as they were learning beekeeping; statewide 65% said they had a mentor.

**Figure 5 PMBA Greatest Value of Beekeeping Educational Experiences**

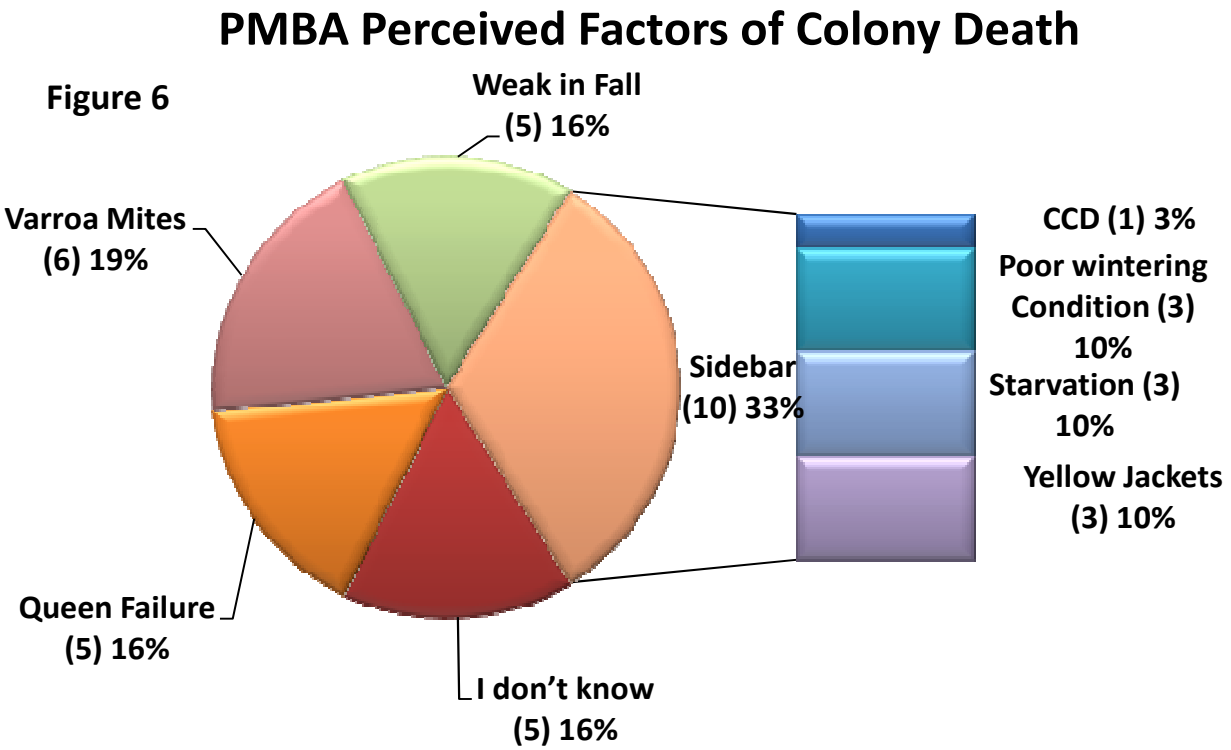


We asked for individuals that had colony loss to estimate what the reason might have been. Multiple responses were permitted. The 3 1 responses by PM beekeepers were varied as expected. Six individuals said losses were due to varroa mites, five each said weak in fall, queen failure or I don't know. Starvation and Poor wintering conditions were listed by 3 individuals, see Figure 5.

When asked for an acceptable loss level 12 individuals said 5, 10 or 15%. 9 chose 20 or 25%. One individual said 50% and another said 100%.

There is no easy way to verify reason(s) for colony loss, nor a consensus of an acceptable level. Colonies in the same apiary may die for different reasons. **Doing the forensics is the first step in seeking to solve a heavy loss problem. More attention to colony strength and possibility of winter starvation will help reduce some of the losses. Control of varroa mites will also help toward loss reduction**.

**Why do colonies die?** There appears to be no single reason for loss and a good deal of variance in opinion as to what might be an acceptable loss level. We are dealing with living animals which are constantly exposed to many different challenges, both in the natural environment and the beekeeper's apiary. Major factors in colony loss are thought to be mites, pesticides, declining nutritional adequacy/forage and diseases, especially viruses and Nosema.



Management, especially learning proper bee care in the first years of beekeeping, remains a factor in losses. What effects our changing environment of things such as global warming, contrails, electromagnetic forces, including human disruption of it, human alteration to the bee's natural environment and other factors, play in colony losses are not at all clear.

Langstroth a hundred and sixty years ago wrote about the importance of taking losses in fall management, saying if the beekeeper neglects such attention to his/her colonies 45% loss levels may occur, depending upon winter weather conditions. It can be argued that losses of 30, 40, 50% or more might be "normal." Older, more experienced beekeepers recall when loss levels were 15% or less. Larger-scale beekeepers have issues with replacing losses about 15% while smaller-scale backyard beekeepers either replace their losses or simply give up after losing their colony(ies). Honey production fluctuates each year but once again seems to be declining on average. Stress of movement of colonies to pollination rentals and finding suitable "clean" forage sites for both larger and smaller scale beekeepers is a challenge. Numbers of U.S. bee colonies have declined since the 1940s, returning to numbers of 100 years ago, while worldwide numbers of bee colonies are steadily increasing.

**There is no simple answer to explain the levels of current losses nor is it possible to demonstrate that they are necessarily excessive for all the issues facing honey bees in the current environment. Varroa mites and the virus they transmit are considered a major factor, but by no means the only reason, colonies are not as healthy as they should be.**

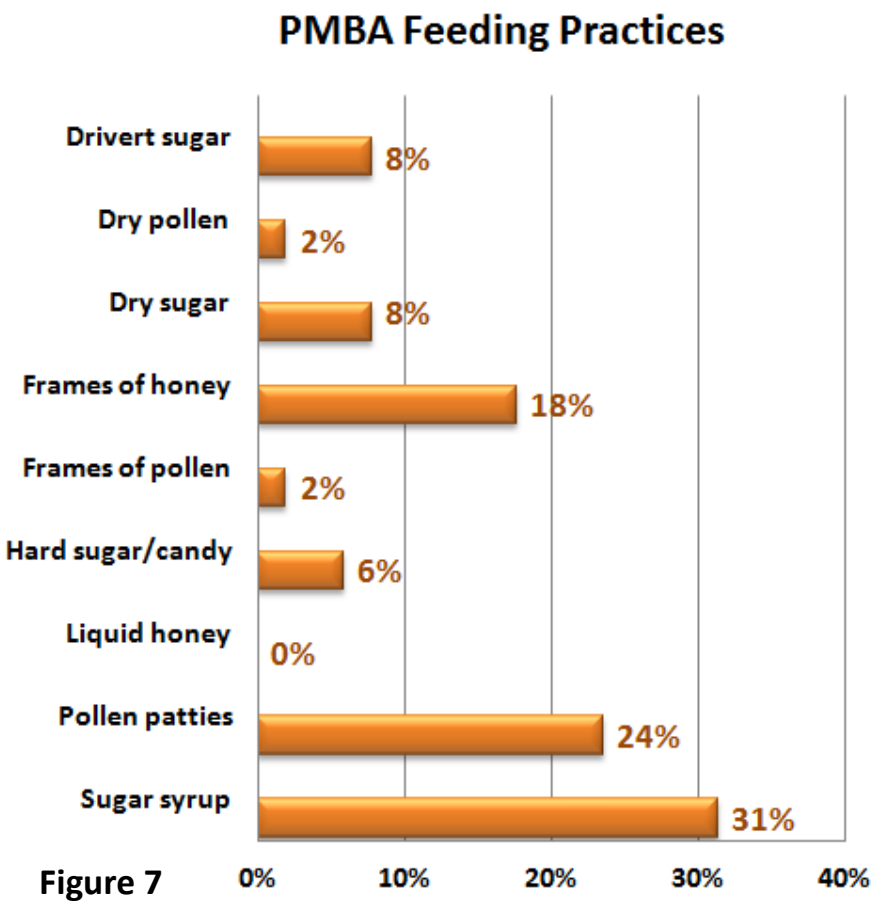



**Figure 7**

## General hive practices

We asked in the survey for information about some managements practiced by respondents. Multiple responses were encouraged.

**Feeding:** There is general consensus that feeding bees' carbohydrate/protein can be useful. The choices of PM beekeepers are shown in

Figure 7. Two individuals (9% of total) did not do any of the options offered. Sugar syrup (16 individuals) followed by pollen patties (12 individuals) and frames of honey were the most common managements, similar to other OR beekeepers. Feeding dry sugar, drivert, fondant and hard sugar candy were done by 3 or 4 individuals each. No one material has been shown to be the most advantageous; feeding hard candy, dry sugar or fondant is preferred during the rainy months so as not to add additional moisture stress to colonies.

**WINTERING PRACTICES**: Seven PM individuals (30%) did NOT do any of the Wintering practices. Most popular selected choices in Figure 8 were use of ventilation/quilt box/lid insulation (12 individuals – 39%) and a rain shelter (7 individuals) as was case last year. Wind/weather protection (listed under "other" in 2014-15) was next most common along with upper entrance (5 individuals each). The other selection was to refrain from inspecting hives below 60 degrees. The wintering selections demonstrate that PM beekeepers are taking extra measures to help colonies survive winter conditions. What we will do with data is compare loss rate with these practices to determine if there is a trend or if one or a few of these reduce winter loss rate. PM and OR beekeeper responses were very similar (see website for OR state beekeeper responses).

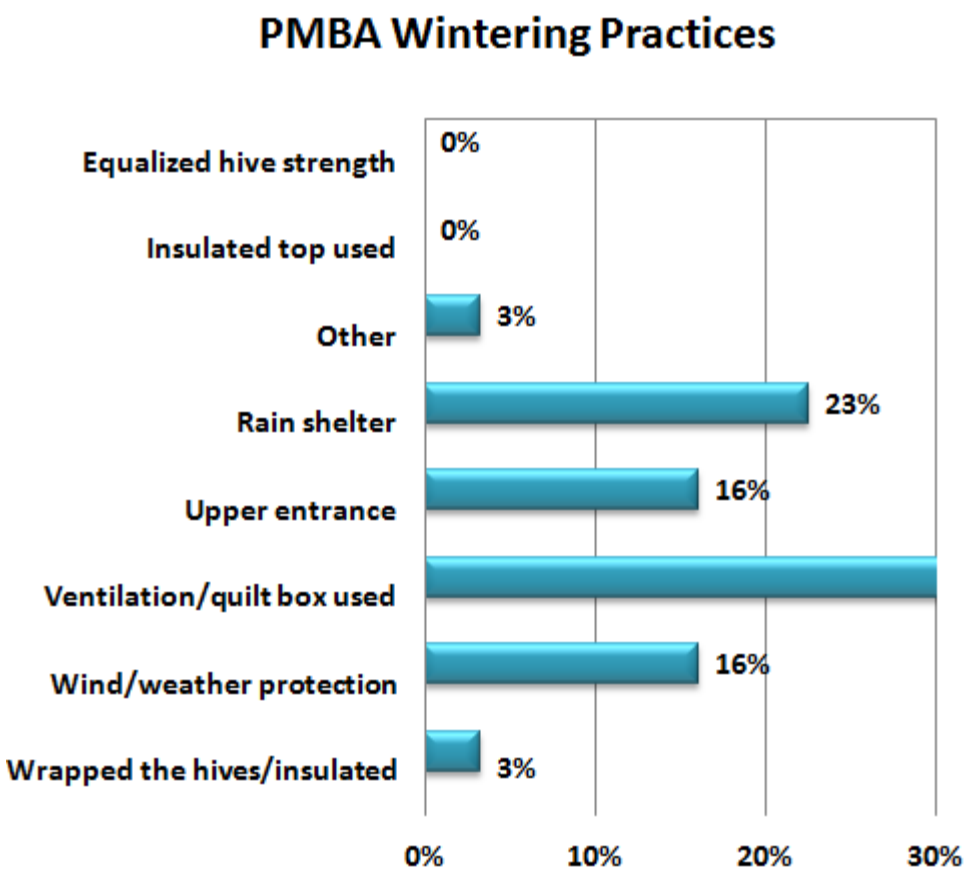



**Figure 8**

**SANITATION PRACTICES**: It is critical that we practice some basic sanitation in our bee care. We probably do too little to help insure healthy bees. Twenty seven percent said they did not practice any of the 8 offered alternatives. The most common selection was minimal hive intervention (10 individuals). Less intervention means less opportunity to compromise sanitation of a hive; needless inspections or manipulations can only interfere with what the bees are doing to stay healthy. As caring bee stewards we should believe we can do our inspections without necessarily compromising bee colony health.

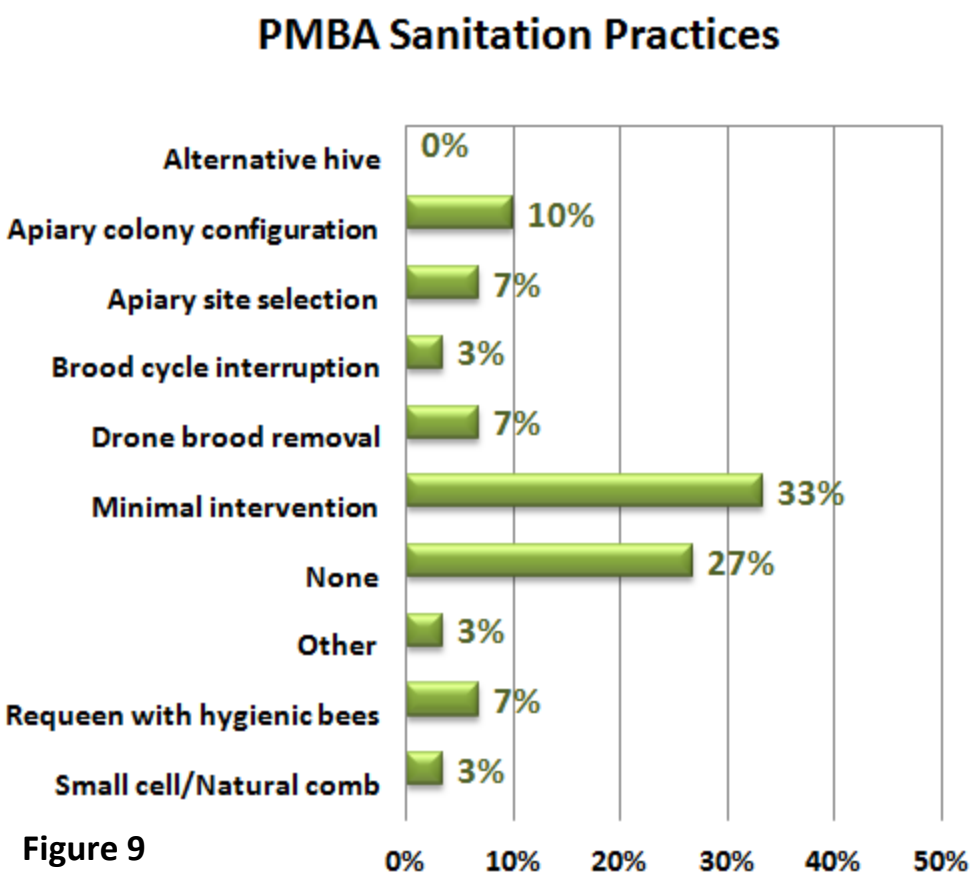



**Figure 9**

Apiary colony configuration (10%) and apiary site selection were next most popular selections. Site selection, both of apiary and colony configuration within the apiary, although less commonly utilized by PM beekeepers, are important sanitation choices because providing colonies with a distinctive "addresses" has been shown to reduce drifting of adult bees and help to reduce incidence of disease and mites.

Small cell/natural brood comb, along with requeening with hygienic bees are proactive approaches, for better mite population control. Along with drone brood removal and brood cycle interruption, all are difficult to do and highly interventive but have been demonstrated to be workable alternatives to chemicals in mite control. NOTE: Some of the choices are not sanitation but rather mite control options – the question and options needs to be modified

**Screen bottom boards**: In our national BIP surveys, fully 95% of respondents indicate they have modified colony bottom boards and now use a screen bottom board. In the survey we asked what percentage of hives had screen bottom boards and whether they were blocked during the winter. Statewide 21% said they did not use screened bottoms; for PM members only 4 individuals said they did not use them. Statewide 66% used them on all their hives while 57% of Portland Metro beekeepers using Screen bottom boards on all their hives. The majority statewide (51%) and in PM (52%) left them open over the winter period (never response). 18% statewide and 22% in PM closed them during the winter. There is no good science on whether open or closed bottoms make a difference in overwintering but some beekeepers "feel" bees do better with them closed overwinter. An open bottom, at least part of the year, can assist the bees in keeping their hive cleaner.

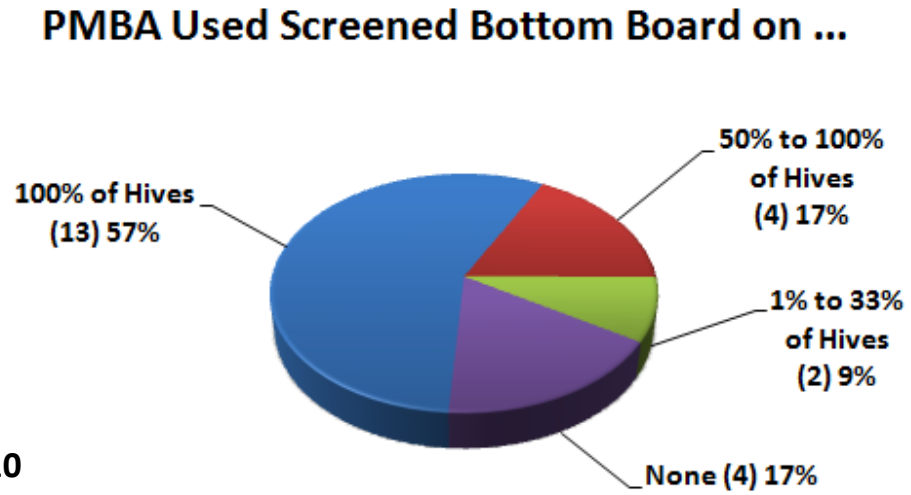
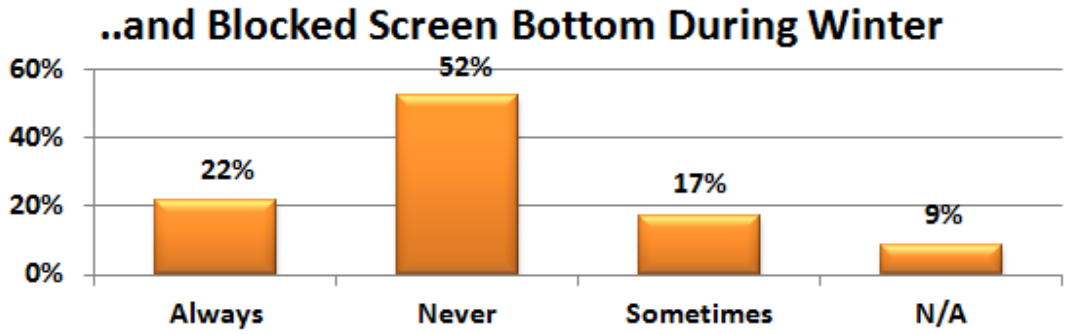


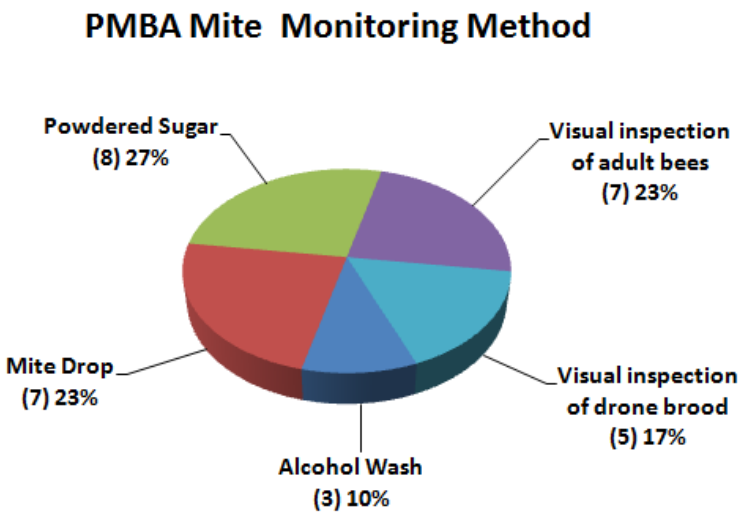

**Figure 10**



## Mite monitoring/sampling and control management

We asked percentage of hives monitored for mites, whether sampling was pre- or post-treatment or both and, of the 5 possible mite sampling methods, what method was used and when it was employed. In order of popularity of use, mite drop/sticky boards (8 individuals) was selected by one more individual than powdered sugar shaking. Alcohol wash was the least employed.

**Figure11**




Seven individuals said they did not monitor for mites while 10 monitored 100% of their hives. More monitored both pre and post treatment than only once

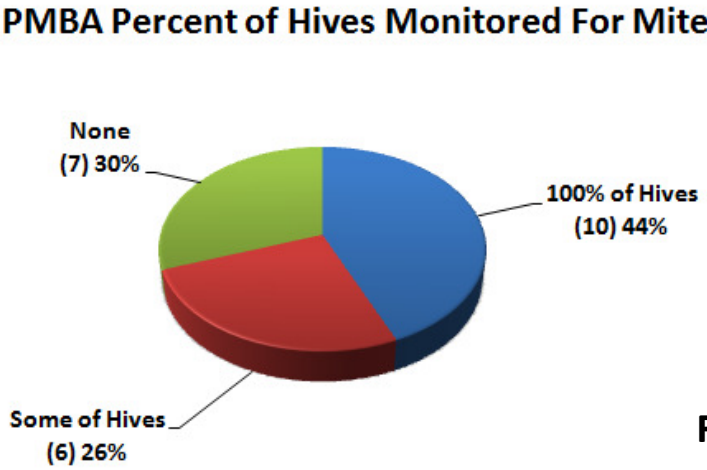
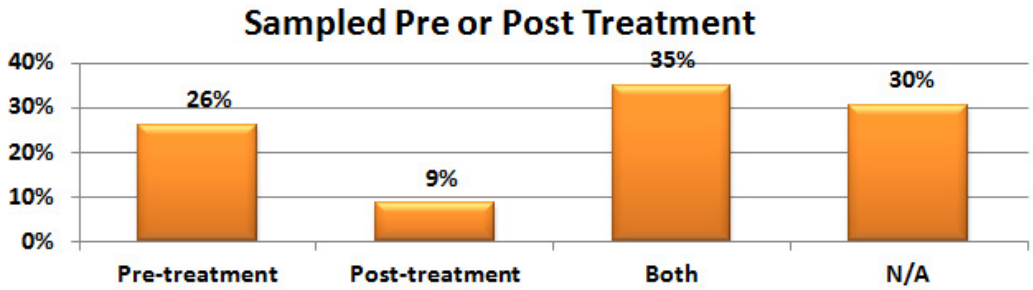



**Figure 12**



## Use of medications and control treatments

The survey asked about chemical and non-chemical mite treatments and also about use of chemicals for mite control. Seven PM individuals (30%) said they did NOT employ a mite control which was 13 percentage points lower than OR beekeepers.

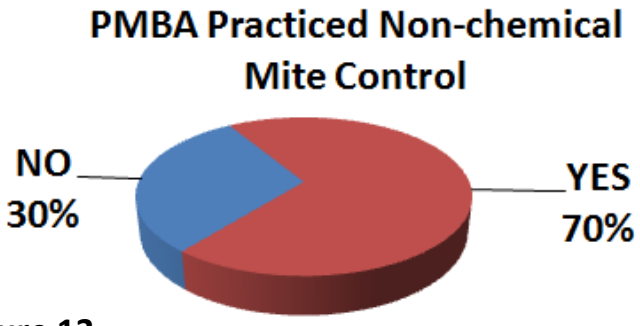
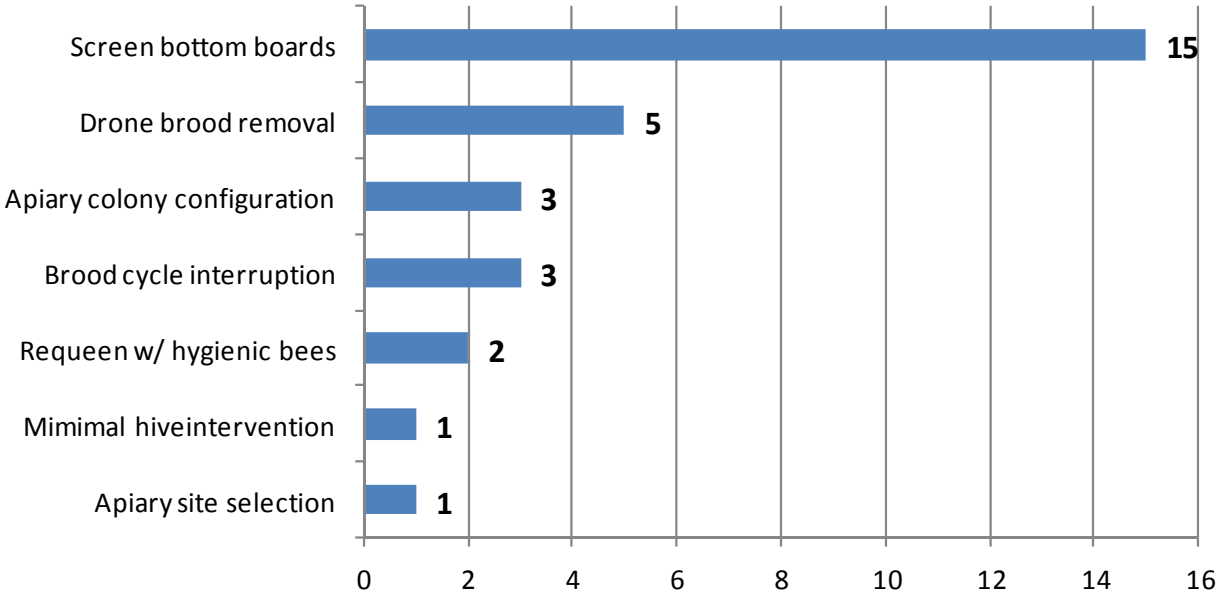



**Figure 13**

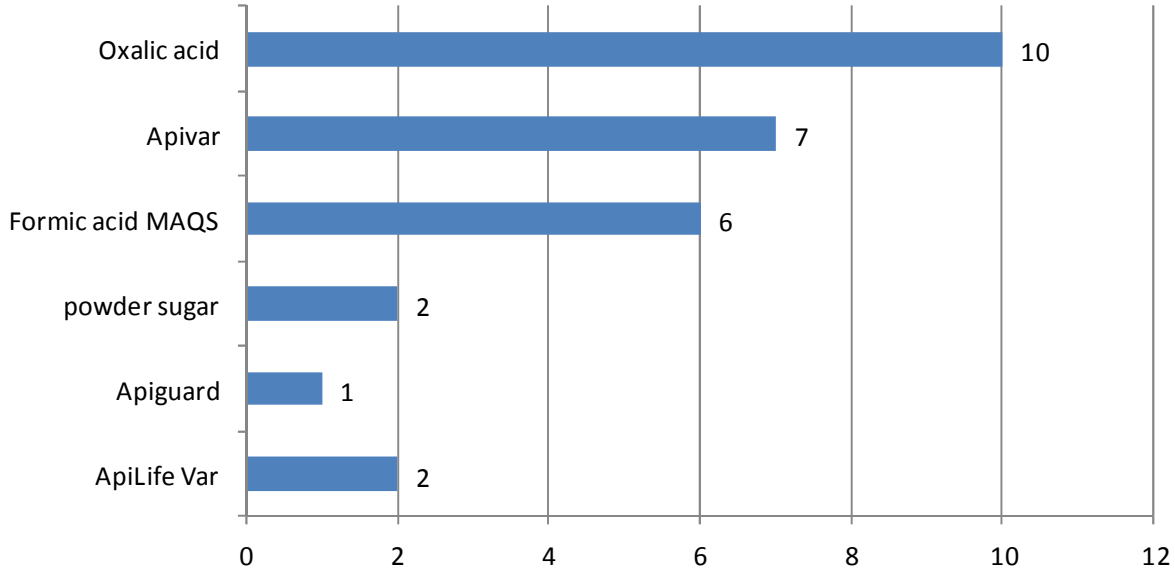
**Non-Chemical control**: Of 10 non-chemical alternatives offered on the survey, seven respondents indicated they did not use any of the choices. For the respondents who checked at least one choice (more than one selection was permitted), use of screened bottom board was by far the most commonly listed technique (15 PM respondents). The next most common selection was drone brood removal. An equal number of PM members (chose apiary colony configuration and brood cycle interruption. the highly interventive and difficult managements of drone brood removal and brood interruption, the most successful mite population reduction managements, were collectively used by eight individuals. Both are labor intensive and require some experience to do successfully. They work well only under limited circumstances Requeening with hygienic bees was done by 2 individuals with one person doing minimal hive intervention and apiary site selection. **Timing of use of these manipulations needs to be completed in time for the bees to properly prepare for winter and insure successful mite reduction.** See Figure 14.

## Figure 14. PM Alternative mite controls



**Chemical control:** For chemical control there were 215 statewide responses, 27 by PM members. Seven individuals said they did NOT use a chemical control. Oxalic acid (10 individuals) was the most popular choice followed by Apivar and Formic acid (MAQS). These selections were very different form the total OR selections – Formic acid, Apivar, Apiguard and Oxylic were the most common in that order. Powder sugar was used by two individuals with the two essential oils used by one individual each.

## Figure 15. PM Chemical mite controls




Six individuals of 144 that responded statewide (4%) indicated they treated with Terramycin for foulbrood disease, one was a PM beekeeper. Thirty individuals (21%) indicated use of Fumigillin for Nosema disease control, 3 in PM.

**What works?** Alternative of drone brood removal is a non-chemical treatment that works in most colonies during spring buildup. You can buy a drone foundation frame or put a shallow frame into a standard brood box and have bees construct drone cells below the shallow bottom bar. The colony doesn't need that many drones so you harvest them in capped stage to discard with their mites. This technique only works during spring buildup.

Breaking the brood cycle, with requeening, especially if hygienic queen stock or local selected stock is used to requeen or replace removed queens, can also keep mite numbers at manageable levels in most bee colonies. Both are a lot of work and new beekeepers should not seek to use such techniques until they have a better understanding of bee colony life cycles and queen event behaviors in colonies.

There is a wide array of chemical treatments available to treat varroa mites and are often the best choices when colony mite populations are high as they can be very effective. Materials that can be used include acids such as formic acid (Mite-Away Quick Strips, or MAQS – especially the ½ dose treatment) and Oxalic or the Hopquard II product when there is little or no brood present, essential oils Apiguard or ApiLife-Var, under narrow temperature conditions and the highly effective synthetic miticide, Apivar (amitraz). All have possible serious negative effects to the beekeeper applicator and they can contaminate the beeswax and honey of the hive. Only use of MAQS is permitted when supers are on colonies. There may be significant queen or brood losses with many of the chemicals and post treatment sampling is recommended to insure the control has worked as expected. It is important to follow label directions. Consult Tools for Varroa Management from Honey Bee Health Coalition, available for free download from OSBA website or www.honeybeehealthcoalition.org/varroa

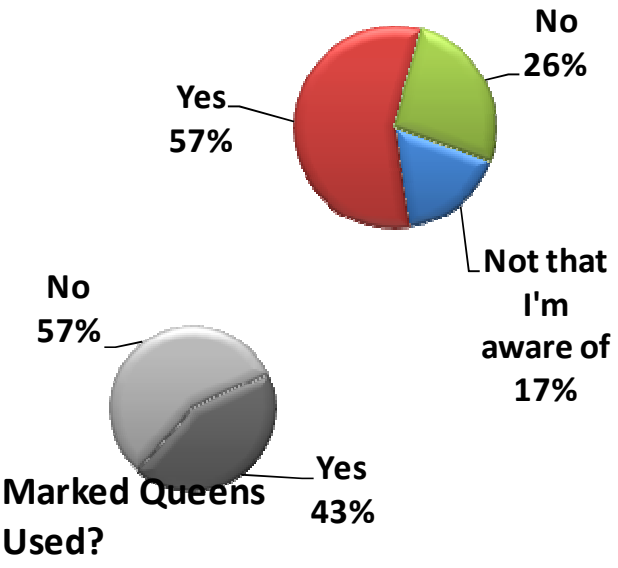
### Queens, Queens, Queens

We hear lots of issues related to queen "problems". On the survey we asked what percentage of loss could be attributed to queen problems. Eleven individuals said none and seven said "I don't know", three said 30-50% and 2 indicated 75-100%.

Queen events can be a significant factor contributing to a colony not performing as expected. We asked "Did you or did your hive requeen, in any form during the year". Thirty one percent of OR beekeepers said no; 26% of PM members said no. Responses were very similar to previous year with slightly fewer saying no (36%) and slightly more saying yes (45% responded yes last year).

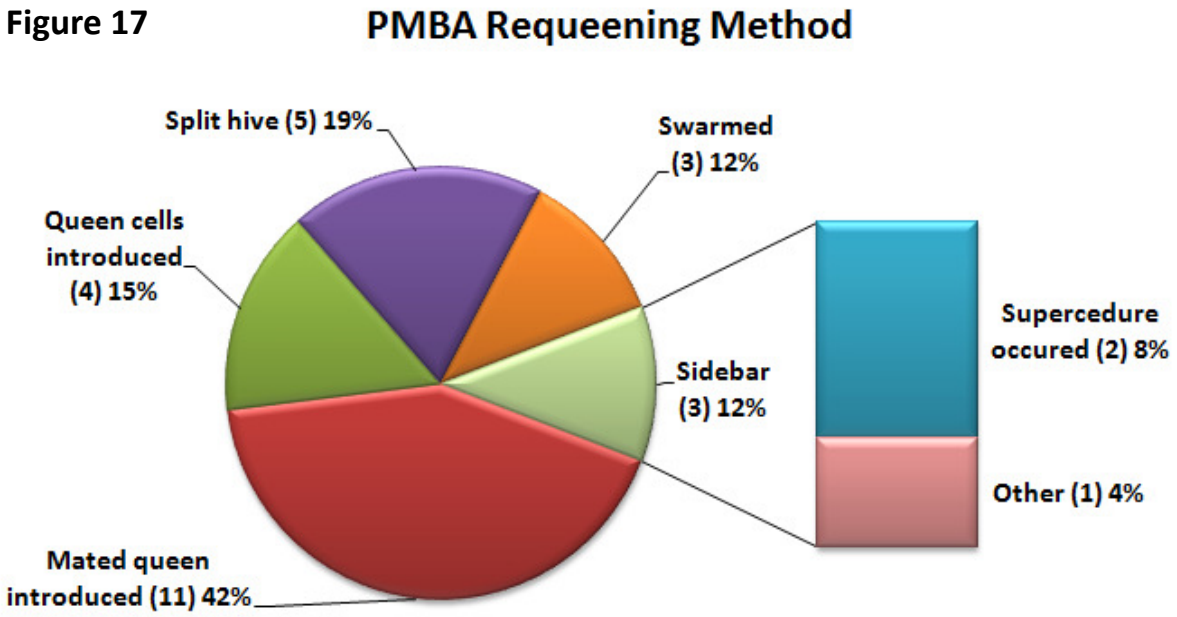
We asked if queens were marked. Four TVBA individuals said yes. It would be difficult to be able to say yes or no if a hive requeened, with absence of queen marking, unless requeening was done by the beekeeper.

**Figure 16. PM hives requeened in any form during the 2015/16 season?**




Responding to the question "How did bees/you requeen" 15 PM beekeepers indicated requeening by the bees via swarming and supersedure. Mated queen introduction was done by 6 individuals; One each split and introduced a queen cell.

**Figure 17**




Fifty one individuals indicated they reared 150 local queens via splitting/grafting or other method; in PM 9 individuals reared 23 queens with 17 surviving. For OR beekeepers, three-fifths of locally reared queens survived winter. See Figure 18.

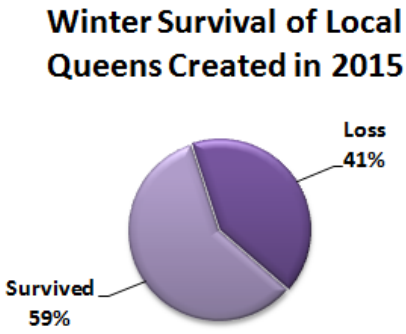



**Figure 18**

We also asked about product production. Seventeen TVA beekeepers produced 1,643 pounds of honey (97 pound per individual average) and 9 indicated some beeswax and one said propolis was also harvested**.**

**Closing comments:** As indicated we will further analyze the loss by managements (feeding/wintering practices/sanitation) as well as losses relative to use of control techniques/chemicals utilized. Some of this information is additionally available on the BeeInformed website (www.beeinformed.org) and individuals are encouraged to examine that data base as well.

**Thank You to all PM members who participated. I**f you find any of this information of value please consider adding your voice to the survey in a subsequent season. To get a notification when next years survey is available please place ***"REMINDER"*** in the subject line of an email sent to info@pnwhoneybeesurvey.com and join us in discussion on the blog.

Dewey Caron and Jenai Fitzpatrick, July 2016