





Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 202804 Report

This analysis was run 01/18/25 on database version 583.

Pham number 202804 has 111 members, 34 are drafts.

Phages represented in each track:

- Track 1 : Brynnie\_12
- Track 2 : Vulpecula\_12, Jamun\_12, Chickaboom\_11
- Track 3 : Eesa\_12
- Track 4 : Pelletreau\_13, Gravel\_13, Toad24\_13, Westrich\_13, Orcanus\_12, KendraB23\_13
- Track 5 : Abidatro\_12
- Track 6 : Ruchi\_12
- Track 7 : Basilisk\_12
- Track 8 : TaylorSipht\_12
- Track 9 : Galaxy\_12
- Track 10 : LittleTokyo\_12
- Track 11 : Melons\_13, Bibble12\_13, Amelia\_13, Polka\_12, Cote\_13, Bedetta\_13, Lunar\_13, Daob\_13, Coral\_12, Colusalem\_12, Kepler\_12, HannahPhantana\_13, Jerole\_13
- Track 12 : Kuleana\_12
- Track 13 : Antrice\_12
- Track 14 : Zhuangyuan\_14
- Track 15 : Juno112\_11, HamCheese\_11, Glotell\_11, PhluffyCoco\_11, KHumphrey\_11, AmiCi24\_11, Atlantica\_11, RedFox\_11, Camara\_11
- Track 16 : Renna12\_12
- Track 17 : StuartMinion\_11
- Track 18 : Andrew\_12
- Track 19 : Leona\_11, Rattail\_11
- Track 20 : Doucette\_12, B22\_12
- Track 21 : E6\_13
- Track 22 : G4\_12
- Track 23 : PFR2\_09, PFR1\_09
- Track 24 : BotCity\_12, Leroy\_12, Horus\_12, ShawBrad\_12, Frickyeah\_12, BENTherdunthat\_12, Asapag\_12
- Track 25 : Malisha\_12
- Track 26 : Lutum\_12, Kenna\_12
- Track 27 : Whitney\_12, Getalong\_12
- Track 28 : CheeseTouch\_12, Budski\_12, Phabuloso\_12, LitninMcQueen\_12, Kamaru\_12, Holliday\_12
- Track 29 : Periwinkle\_12
- Track 30 : Spooky\_12
- Track 31 : Squiddly\_13, Phistory\_12

- Track 32 : Jabbawokkie\_14, Soul22\_13, Avani\_13, Yoshi\_13, Che9d\_13, Demsculpinboyz\_13, Blarby\_14, Zapner\_14
- Track 33 : BrayBeast\_11
- Track 34 : Kumotta\_12
- Track 35 : Sarge\_11
- Track 36 : MargaretKali\_12
- Track 37 : Pigu\_11
- Track 38 : Shoya\_10
- Track 39 : Alatato\_10
- Track 40 : Scotia\_13, NoSwimming\_13
- Track 41 : PrairieDogTown\_18, EvenBluerMoon\_14
- Track 42 : Aoka\_12
- Track 43 : JanetJ\_12
- Track 44 : CocoCinnamon\_15
- Track 45 : Maja\_11
- Track 46 : AnnabelLee\_13
- Track 47 : Audell\_16
- Track 48 : Gaia\_9, Nebkiss\_9
- Track 49 : AuntGwenStacy\_18
- Track 50 : Bipper\_18, Cracklewink\_18
- Track 51 : Hilltopfarm\_18, Typha\_18
- Track 52 : Spartoi\_10
- Track 53 : LilSpotty\_11
- Track 54 : Sleepyhead\_12
- Track 55 : DS6A\_15

***Summary of Final Annotations (See graph section above for start numbers):***

The start number called the most often in the published annotations is 13, it was called in 29 of the 77 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Abidatro\_12, Amelia\_13, AmiCi24\_11, Andrew\_12, Atlantica\_11, AuntGwenStacy\_18, Basilisk\_12, Bedetta\_13, Bible12\_13, Brynnie\_12, Camara\_11, Chickaboom\_11, Colusalem\_12, Coral\_12, Cote\_13, Daob\_13, Eesa\_12, Galaxy\_12, Glotell\_11, Gravel\_13, HamCheese\_11, HannahPhantana\_13, Jamun\_12, Jerole\_13, Juno112\_11, KHumphrey\_11, KendraB23\_13, Kepler\_12, Kuleana\_12, Leona\_11, LittleTokyo\_12, Lunar\_13, Melons\_13, Orcanus\_12, Pelletreau\_13, PhluffyCoco\_11, Polka\_12, Rattail\_11, RedFox\_11, Renna12\_12, Ruchi\_12, StuartMinion\_11, TaylorSipht\_12, Toad24\_13, Vulpecula\_12, Westrich\_13,

Genes that have the "Most Annotated" start but do not call it:

- Antrice\_12, Bipper\_18, Cracklewink\_18, Hilltopfarm\_18, Typha\_18, Zhuangyuan\_14,

Genes that do not have the "Most Annotated" start:

- Alatato\_10, AnnabelLee\_13, Aoka\_12, Asapag\_12, Audell\_16, Avani\_13, B22\_12, BENtherdunthat\_12, Blarby\_14, BotCity\_12, BrayBeast\_11, Budski\_12, Che9d\_13, CheeseTouch\_12, CocoCinnamon\_15, DS6A\_15, Demsculpinboyz\_13, Doucette\_12, E6\_13, EvenBluerMoon\_14, Frickyeah\_12, G4\_12, Gaia\_9, Getalong\_12,

Holliday\_12, Horus\_12, Jabbawokkie\_14, JanetJ\_12, Kamaru\_12, Kenna\_12, Kumotta\_12, Leroy\_12, LilSpotty\_11, LitninMcQueen\_12, Lutum\_12, Maja\_11, Malisha\_12, MargaretKali\_12, Nebkiss\_9, NoSwimming\_13, PFR1\_09, PFR2\_09, Periwinkle\_12, Phabuloso\_12, Phistory\_12, Pigu\_11, PrairieDogTown\_18, Sarge\_11, Scotia\_13, ShawBrad\_12, Shoya\_10, Sleepyhead\_12, Soul22\_13, Spartoi\_10, Spooky\_12, Squiddly\_13, Whitney\_12, Yoshi\_13, Zapner\_14,

### Summary by start number:

#### Start 8:

- Found in 11 of 111 ( 9.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 9.1% of time when present
- Phage (with cluster) where this start called: Antrice\_12 (AS2),

#### Start 10:

- Found in 2 of 111 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Zhuangyuan\_14 (AS2),

#### Start 11:

- Found in 8 of 111 ( 7.2% ) of genes in pham
- Manual Annotations of this start: 7 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Avani\_13 (F2), Blarby\_14 (F), Che9d\_13 (F2), Demsculpinboyz\_13 (F2), Jabbawokkie\_14 (F2), Soul22\_13 (F2), Yoshi\_13 (F2), Zapner\_14 (F2),

#### Start 12:

- Found in 5 of 111 ( 4.5% ) of genes in pham
- Manual Annotations of this start: 4 of 77
- Called 80.0% of time when present
- Phage (with cluster) where this start called: Bipper\_18 (Y), Cracklewink\_18 (Y), Hilltopfarm\_18 (Y), Typha\_18 (Y),

#### Start 13:

- Found in 52 of 111 ( 46.8% ) of genes in pham
- Manual Annotations of this start: 29 of 77
- Called 88.5% of time when present
- Phage (with cluster) where this start called: Abidatro\_12 (AS1), Amelia\_13 (AS2), AmiCi24\_11 (AS3), Andrew\_12 (AS3), Atlantica\_11 (AS3), AuntGwenStacy\_18 (Y), Basilisk\_12 (AS1), Bedetta\_13 (AS2), Bibble12\_13 (AS2), Brynnie\_12 (AS1), Camara\_11 (AS3), Chickaboom\_11 (AS1), Colusalem\_12 (AS2), Coral\_12 (AS2), Cote\_13 (AS2), Daob\_13 (AS2), Eesa\_12 (AS1), Galaxy\_12 (AS1), Glotell\_11 (AS3), Gravel\_13 (AS1), HamCheese\_11 (AS3), HannahPhantana\_13 (AS2), Jamun\_12 (AS1), Jerole\_13 (AS2), Juno112\_11 (AS3), KHumphrey\_11 (AS3), KendraB23\_13 (AS1), Kepler\_12 (AS2), Kuleana\_12 (AS2), Leona\_11 (AS3), LittleTokyo\_12 (AS2), Lunar\_13 (AS2), Melons\_13 (AS2), Orcanus\_12 (AS1), Pelletreau\_13 (AS1), PhluffyCoco\_11 (AS3), Polka\_12 (AS2), Rattail\_11 (AS3), RedFox\_11 (AS3), Renna12\_12 (AS3), Ruchi\_12 (AS1), StuartMinion\_11 (AS3), TaylorSipht\_12 (AS1), Toad24\_13 (AS1), Vulpecula\_12 (AS1), Westrich\_13 (AS1),

#### Start 15:

- Found in 25 of 111 ( 22.5% ) of genes in pham
- Manual Annotations of this start: 20 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AnnabelLee\_13 (FR), Asapag\_12 (DN1), Audell\_16 (FR), BENtherdunthat\_12 (DN1), BotCity\_12 (DN), Budski\_12 (DN), CheeseTouch\_12 (DN1), Frickyeah\_12 (DN1), Getalong\_12 (DN1), Holliday\_12 (DN1), Horus\_12 (DN1), Kamaru\_12 (DN1), Kenna\_12 (DN1), Leroy\_12 (DN1), LitninMcQueen\_12 (DN1), Lutum\_12 (DN1), Malisha\_12 (DN), Periwinkle\_12 (DN1), Phabuloso\_12 (DN1), Phistory\_12 (DN1), ShawBrad\_12 (DN1), Spartoi\_10 (singleton), Spooky\_12 (DN2), Squiddly\_13 (DN2), Whitney\_12 (DN1),

#### Start 17:

- Found in 15 of 111 ( 13.5% ) of genes in pham
- Manual Annotations of this start: 8 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alatato\_10 (FB), Aoka\_12 (FO), BrayBeast\_11 (FB), CocoCinnamon\_15 (FO), EvenBluerMoon\_14 (FO), JanetJ\_12 (FO), Kumotta\_12 (FB), Maja\_11 (FO), MargaretKali\_12 (FB), NoSwimming\_13 (FO), Pigu\_11 (FB), PrairieDogTown\_18 (FO), Sarge\_11 (FB), Scotia\_13 (FO), Shoya\_10 (FB),

#### Start 18:

- Found in 2 of 111 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: PFR1\_09 (BX), PFR2\_09 (BX),

#### Start 20:

- Found in 8 of 111 ( 7.2% ) of genes in pham
- Manual Annotations of this start: 8 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: B22\_12 (BW), DS6A\_15 (singleton), Doucette\_12 (BW), E6\_13 (BW), G4\_12 (BW), Gaia\_9 (X), LilSpotty\_11 (singleton), Nebkiss\_9 (X),

#### Start 21:

- Found in 8 of 111 ( 7.2% ) of genes in pham
- Manual Annotations of this start: 1 of 77
- Called 12.5% of time when present
- Phage (with cluster) where this start called: Sleepyhead\_12 (singleton),

### Summary by clusters:

There are 16 clusters represented in this pham: AS3, AS2, F2, F, FR, AS1, FB, BW, DN1, DN2, Y, X, singleton, BX, DN, FO,

#### Info for manual annotations of cluster AS1:

- Start number 13 was manually annotated 11 times for cluster AS1.

#### Info for manual annotations of cluster AS2:

- Start number 13 was manually annotated 11 times for cluster AS2.

Info for manual annotations of cluster AS3:

- Start number 13 was manually annotated 7 times for cluster AS3.

Info for manual annotations of cluster BW:

- Start number 20 was manually annotated 4 times for cluster BW.

Info for manual annotations of cluster DN:

- Start number 15 was manually annotated 2 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 15 was manually annotated 15 times for cluster DN1.

Info for manual annotations of cluster DN2:

- Start number 15 was manually annotated 2 times for cluster DN2.

Info for manual annotations of cluster F2:

- Start number 11 was manually annotated 7 times for cluster F2.

Info for manual annotations of cluster FB:

- Start number 17 was manually annotated 5 times for cluster FB.

Info for manual annotations of cluster FO:

- Start number 17 was manually annotated 3 times for cluster FO.

Info for manual annotations of cluster X:

- Start number 20 was manually annotated 2 times for cluster X.

Info for manual annotations of cluster Y:

- Start number 12 was manually annotated 4 times for cluster Y.

### ***Gene Information:***

Gene: Abidatro\_12 Start: 8321, Stop: 8764, Start Num: 13

Candidate Starts for Abidatro\_12:

(Start: 13 @8321 has 29 MA's), (Start: 21 @8363 has 1 MA's), (35, 8417), (50, 8471), (52, 8474), (58, 8507), (85, 8606), (90, 8633), (95, 8657), (98, 8663), (103, 8672),

Gene: Alatato\_10 Start: 7192, Stop: 7572, Start Num: 17

Candidate Starts for Alatato\_10:

(Start: 17 @7192 has 8 MA's), (34, 7252), (42, 7270), (64, 7357), (66, 7363), (89, 7459), (91, 7465), (110, 7534),

Gene: Amelia\_13 Start: 8497, Stop: 8940, Start Num: 13

Candidate Starts for Amelia\_13:

(Start: 13 @8497 has 29 MA's), (31, 8587), (35, 8593), (50, 8647), (52, 8650), (60, 8689), (90, 8809), (95, 8833), (114, 8905), (115, 8911),

Gene: AmiCi24\_11 Start: 7902, Stop: 8342, Start Num: 13

Candidate Starts for AmiCi24\_11:

(Start: 13 @7902 has 29 MA's), (22, 7953), (52, 8055), (53, 8058), (60, 8094), (62, 8100), (66, 8115), (85, 8187), (90, 8214), (114, 8313), (115, 8319), (117, 8331),

Gene: Andrew\_12 Start: 8281, Stop: 8724, Start Num: 13

Candidate Starts for Andrew\_12:

(Start: 13 @8281 has 29 MA's), (22, 8332), (31, 8371), (37, 8380), (50, 8431), (52, 8434), (53, 8437), (60, 8473), (62, 8479), (90, 8593), (94, 8608), (114, 8692), (115, 8698), (117, 8710),

Gene: AnnabelLee\_13 Start: 7727, Stop: 8119, Start Num: 15

Candidate Starts for AnnabelLee\_13:

(Start: 15 @7727 has 20 MA's), (45, 7826), (46, 7829), (58, 7880), (59, 7883), (85, 7970), (86, 7973), (113, 8087), (118, 8111),

Gene: Antrice\_12 Start: 8225, Stop: 8680, Start Num: 8

Candidate Starts for Antrice\_12:

(8, 8225), (Start: 13 @8237 has 29 MA's), (53, 8393), (66, 8450), (80, 8507), (81, 8510), (95, 8573), (98, 8579), (106, 8612), (114, 8648), (117, 8666),

Gene: Aoka\_12 Start: 8710, Stop: 9090, Start Num: 17

Candidate Starts for Aoka\_12:

(Start: 17 @8710 has 8 MA's), (75, 8923), (78, 8935), (95, 9007), (104, 9022),

Gene: Asapag\_12 Start: 7041, Stop: 7451, Start Num: 15

Candidate Starts for Asapag\_12:

(2, 6912), (4, 6957), (5, 6963), (6, 6969), (7, 6987), (Start: 15 @7041 has 20 MA's), (22, 7068), (36, 7113), (38, 7119), (49, 7173), (59, 7212), (61, 7218), (68, 7239), (81, 7290), (85, 7302),

Gene: Atlantica\_11 Start: 7902, Stop: 8342, Start Num: 13

Candidate Starts for Atlantica\_11:

(Start: 13 @7902 has 29 MA's), (22, 7953), (52, 8055), (53, 8058), (60, 8094), (62, 8100), (66, 8115), (85, 8187), (90, 8214), (114, 8313), (115, 8319), (117, 8331),

Gene: Audell\_16 Start: 11067, Stop: 11459, Start Num: 15

Candidate Starts for Audell\_16:

(Start: 15 @11067 has 20 MA's), (30, 11130), (59, 11223), (70, 11253), (83, 11307), (85, 11310), (86, 11313), (93, 11349), (118, 11451),

Gene: AuntGwenStacy\_18 Start: 11997, Stop: 12434, Start Num: 13

Candidate Starts for AuntGwenStacy\_18:

(Start: 12 @11994 has 4 MA's), (Start: 13 @11997 has 29 MA's), (28, 12075), (30, 12084), (32, 12090), (35, 12096), (56, 12174), (74, 12240), (85, 12276), (105, 12351), (112, 12390),

Gene: Avani\_13 Start: 7213, Stop: 7617, Start Num: 11

Candidate Starts for Avani\_13:

(Start: 11 @7213 has 7 MA's), (16, 7246), (33, 7306), (51, 7372), (84, 7492), (87, 7504), (102, 7540), (108, 7570),

Gene: B22\_12 Start: 7687, Stop: 8055, Start Num: 20

Candidate Starts for B22\_12:

(1, 7486), (Start: 20 @7687 has 8 MA's), (36, 7744), (50, 7795), (79, 7906), (81, 7912), (85, 7924),

Gene: BENtherdunthat\_12 Start: 7041, Stop: 7451, Start Num: 15



Candidate Starts for BENtherdunthat\_12:

(2, 6912), (4, 6957), (5, 6963), (6, 6969), (7, 6987), (Start: 15 @7041 has 20 MA's), (22, 7068), (36, 7113), (38, 7119), (49, 7173), (59, 7212), (61, 7218), (68, 7239), (81, 7290), (85, 7302),

Gene: Basilisk\_12 Start: 8645, Stop: 9088, Start Num: 13

Candidate Starts for Basilisk\_12:

(3, 8570), (Start: 13 @8645 has 29 MA's), (Start: 21 @8687 has 1 MA's), (24, 8705), (35, 8741), (50, 8795), (52, 8798), (60, 8837), (73, 8891), (85, 8930), (90, 8957), (95, 8981), (98, 8987),

Gene: Bedetta\_13 Start: 8497, Stop: 8940, Start Num: 13

Candidate Starts for Bedetta\_13:

(Start: 13 @8497 has 29 MA's), (31, 8587), (35, 8593), (50, 8647), (52, 8650), (60, 8689), (90, 8809), (95, 8833), (114, 8905), (115, 8911),

Gene: Bible12\_13 Start: 8500, Stop: 8943, Start Num: 13

Candidate Starts for Bible12\_13:

(Start: 13 @8500 has 29 MA's), (31, 8590), (35, 8596), (50, 8650), (52, 8653), (60, 8692), (90, 8812), (95, 8836), (114, 8908), (115, 8914),

Gene: Bipper\_18 Start: 12080, Stop: 12517, Start Num: 12

Candidate Starts for Bipper\_18:

(Start: 12 @12080 has 4 MA's), (Start: 13 @12083 has 29 MA's), (25, 12146), (28, 12158), (30, 12167), (35, 12179), (53, 12239), (66, 12296), (74, 12323), (76, 12332), (86, 12362), (101, 12419), (107, 12449), (112, 12473),

Gene: Blarby\_14 Start: 7737, Stop: 8141, Start Num: 11

Candidate Starts for Blarby\_14:

(Start: 11 @7737 has 7 MA's), (16, 7770), (33, 7830), (51, 7896), (84, 8016), (87, 8028), (102, 8064), (108, 8094),

Gene: BotCity\_12 Start: 7039, Stop: 7449, Start Num: 15

Candidate Starts for BotCity\_12:

(2, 6910), (4, 6955), (5, 6961), (6, 6967), (7, 6985), (Start: 15 @7039 has 20 MA's), (22, 7066), (36, 7111), (38, 7117), (49, 7171), (59, 7210), (61, 7216), (68, 7237), (81, 7288), (85, 7300),

Gene: BrayBeast\_11 Start: 7602, Stop: 7979, Start Num: 17

Candidate Starts for BrayBeast\_11:

(Start: 17 @7602 has 8 MA's), (34, 7659), (53, 7716), (58, 7743), (64, 7764), (66, 7770), (91, 7872), (104, 7908), (110, 7941),

Gene: Brynnie\_12 Start: 8457, Stop: 8900, Start Num: 13

Candidate Starts for Brynnie\_12:

(Start: 13 @8457 has 29 MA's), (Start: 21 @8499 has 1 MA's), (35, 8553), (50, 8607), (52, 8610), (60, 8649), (73, 8703), (85, 8742), (90, 8769), (95, 8793), (98, 8799),

Gene: Budski\_12 Start: 7046, Stop: 7438, Start Num: 15

Candidate Starts for Budski\_12:

(2, 6917), (4, 6962), (5, 6968), (6, 6974), (7, 6992), (9, 7010), (Start: 15 @7046 has 20 MA's), (22, 7073), (36, 7118), (38, 7124), (42, 7136), (49, 7160), (59, 7199), (61, 7205), (66, 7220), (68, 7226), (81, 7277), (85, 7289), (99, 7343),

Gene: Camara\_11 Start: 7903, Stop: 8343, Start Num: 13

Candidate Starts for Camara\_11:

(Start: 13 @7903 has 29 MA's), (22, 7954), (52, 8056), (53, 8059), (60, 8095), (62, 8101), (66, 8116), (85, 8188), (90, 8215), (114, 8314), (115, 8320), (117, 8332),

Gene: Che9d\_13 Start: 7222, Stop: 7626, Start Num: 11

Candidate Starts for Che9d\_13:

(Start: 11 @7222 has 7 MA's), (16, 7255), (33, 7315), (51, 7381), (84, 7501), (87, 7513), (102, 7549), (108, 7579),

Gene: CheeseTouch\_12 Start: 7046, Stop: 7438, Start Num: 15

Candidate Starts for CheeseTouch\_12:

(2, 6917), (4, 6962), (5, 6968), (6, 6974), (7, 6992), (9, 7010), (Start: 15 @7046 has 20 MA's), (22, 7073), (36, 7118), (38, 7124), (42, 7136), (49, 7160), (59, 7199), (61, 7205), (66, 7220), (68, 7226), (81, 7277), (85, 7289), (99, 7343),

Gene: Chickaboom\_11 Start: 8002, Stop: 8445, Start Num: 13

Candidate Starts for Chickaboom\_11:

(Start: 13 @8002 has 29 MA's), (Start: 21 @8044 has 1 MA's), (24, 8062), (35, 8098), (50, 8152), (52, 8155), (60, 8194), (73, 8248), (85, 8287), (90, 8314), (95, 8338), (98, 8344),

Gene: CocoCinnamon\_15 Start: 8936, Stop: 9316, Start Num: 17

Candidate Starts for CocoCinnamon\_15:

(Start: 17 @8936 has 8 MA's), (64, 9101), (66, 9107), (89, 9203), (91, 9209), (104, 9245), (110, 9278),

Gene: Colusalem\_12 Start: 8336, Stop: 8779, Start Num: 13

Candidate Starts for Colusalem\_12:

(Start: 13 @8336 has 29 MA's), (31, 8426), (35, 8432), (50, 8486), (52, 8489), (60, 8528), (90, 8648), (95, 8672), (114, 8744), (115, 8750),

Gene: Coral\_12 Start: 8336, Stop: 8779, Start Num: 13

Candidate Starts for Coral\_12:

(Start: 13 @8336 has 29 MA's), (31, 8426), (35, 8432), (50, 8486), (52, 8489), (60, 8528), (90, 8648), (95, 8672), (114, 8744), (115, 8750),

Gene: Cote\_13 Start: 8497, Stop: 8940, Start Num: 13

Candidate Starts for Cote\_13:

(Start: 13 @8497 has 29 MA's), (31, 8587), (35, 8593), (50, 8647), (52, 8650), (60, 8689), (90, 8809), (95, 8833), (114, 8905), (115, 8911),

Gene: Cracklewink\_18 Start: 12080, Stop: 12517, Start Num: 12

Candidate Starts for Cracklewink\_18:

(Start: 12 @12080 has 4 MA's), (Start: 13 @12083 has 29 MA's), (25, 12146), (28, 12158), (30, 12167), (35, 12179), (53, 12239), (66, 12296), (74, 12323), (76, 12332), (86, 12362), (101, 12419), (107, 12449), (112, 12473),

Gene: DS6A\_15 Start: 10364, Stop: 10735, Start Num: 20

Candidate Starts for DS6A\_15:

(Start: 20 @10364 has 8 MA's), (38, 10427), (42, 10439), (50, 10466), (61, 10511), (67, 10532), (81, 10586), (86, 10601), (93, 10628), (97, 10643), (105, 10664), (109, 10688),

Gene: Daob\_13 Start: 8500, Stop: 8943, Start Num: 13

Candidate Starts for Daob\_13:

(Start: 13 @8500 has 29 MA's), (31, 8590), (35, 8596), (50, 8650), (52, 8653), (60, 8692), (90, 8812), (95, 8836), (114, 8908), (115, 8914),

Gene: Demsculpinboyz\_13 Start: 7213, Stop: 7617, Start Num: 11  
Candidate Starts for Demsculpinboyz\_13:  
(Start: 11 @7213 has 7 MA's), (16, 7246), (33, 7306), (51, 7372), (84, 7492), (87, 7504), (102, 7540),  
(108, 7570),

Gene: Doucette\_12 Start: 7747, Stop: 8115, Start Num: 20  
Candidate Starts for Doucette\_12:  
(1, 7546), (Start: 20 @7747 has 8 MA's), (36, 7804), (50, 7855), (79, 7966), (81, 7972), (85, 7984),

Gene: E6\_13 Start: 7798, Stop: 8166, Start Num: 20  
Candidate Starts for E6\_13:  
(1, 7597), (Start: 20 @7798 has 8 MA's), (36, 7855), (50, 7906), (79, 8017), (81, 8023), (85, 8035), (88,  
8056),

Gene: Eesa\_12 Start: 8495, Stop: 8935, Start Num: 13  
Candidate Starts for Eesa\_12:  
(8, 8483), (Start: 13 @8495 has 29 MA's), (31, 8585), (35, 8591), (46, 8627), (50, 8645), (52, 8648),  
(60, 8687), (85, 8780), (90, 8807), (95, 8831), (106, 8867), (114, 8903),

Gene: EvenBluerMoon\_14 Start: 8744, Stop: 9133, Start Num: 17  
Candidate Starts for EvenBluerMoon\_14:  
(Start: 17 @8744 has 8 MA's), (58, 8891), (75, 8957), (78, 8969),

Gene: Frickyeah\_12 Start: 7041, Stop: 7451, Start Num: 15  
Candidate Starts for Frickyeah\_12:  
(2, 6912), (4, 6957), (5, 6963), (6, 6969), (7, 6987), (Start: 15 @7041 has 20 MA's), (22, 7068), (36,  
7113), (38, 7119), (49, 7173), (59, 7212), (61, 7218), (68, 7239), (81, 7290), (85, 7302),

Gene: G4\_12 Start: 7735, Stop: 8103, Start Num: 20  
Candidate Starts for G4\_12:  
(1, 7534), (Start: 20 @7735 has 8 MA's), (36, 7792), (79, 7954), (81, 7960), (85, 7972), (89, 7996),

Gene: Gaia\_9 Start: 7642, Stop: 8013, Start Num: 20  
Candidate Starts for Gaia\_9:  
(Start: 20 @7642 has 8 MA's), (48, 7738), (54, 7759), (59, 7786), (60, 7789), (61, 7792), (66, 7807),  
(81, 7864), (85, 7876), (96, 7921), (111, 7981), (113, 7987), (115, 7993),

Gene: Galaxy\_12 Start: 8328, Stop: 8771, Start Num: 13  
Candidate Starts for Galaxy\_12:  
(Start: 13 @8328 has 29 MA's), (35, 8424), (50, 8478), (52, 8481), (58, 8514), (85, 8613), (90, 8640),  
(95, 8664), (98, 8670), (103, 8679),

Gene: Getalong\_12 Start: 7041, Stop: 7433, Start Num: 15  
Candidate Starts for Getalong\_12:  
(2, 6912), (4, 6957), (5, 6963), (6, 6969), (7, 6987), (Start: 15 @7041 has 20 MA's), (22, 7068), (33,  
7107), (36, 7113), (38, 7119), (42, 7131), (49, 7155), (59, 7194), (61, 7200), (65, 7212), (68, 7221), (81,  
7272), (85, 7284),

Gene: Glotell\_11 Start: 7902, Stop: 8342, Start Num: 13  
Candidate Starts for Glotell\_11:  
(Start: 13 @7902 has 29 MA's), (22, 7953), (52, 8055), (53, 8058), (60, 8094), (62, 8100), (66, 8115),  
(85, 8187), (90, 8214), (114, 8313), (115, 8319), (117, 8331),

Gene: Gravel\_13 Start: 8491, Stop: 8931, Start Num: 13

Candidate Starts for Gravel\_13:

(8, 8479), (Start: 13 @8491 has 29 MA's), (31, 8581), (46, 8623), (50, 8641), (52, 8644), (60, 8683), (85, 8776), (90, 8803), (95, 8827), (106, 8863), (114, 8899),

Gene: HamCheese\_11 Start: 7902, Stop: 8342, Start Num: 13

Candidate Starts for HamCheese\_11:

(Start: 13 @7902 has 29 MA's), (22, 7953), (52, 8055), (53, 8058), (60, 8094), (62, 8100), (66, 8115), (85, 8187), (90, 8214), (114, 8313), (115, 8319), (117, 8331),

Gene: HannahPhantana\_13 Start: 8500, Stop: 8943, Start Num: 13

Candidate Starts for HannahPhantana\_13:

(Start: 13 @8500 has 29 MA's), (31, 8590), (35, 8596), (50, 8650), (52, 8653), (60, 8692), (90, 8812), (95, 8836), (114, 8908), (115, 8914),

Gene: Hilltopfarm\_18 Start: 12024, Stop: 12464, Start Num: 12

Candidate Starts for Hilltopfarm\_18:

(Start: 12 @12024 has 4 MA's), (Start: 13 @12027 has 29 MA's), (28, 12105), (30, 12114), (32, 12120), (35, 12126), (56, 12204), (74, 12270), (85, 12306), (105, 12381), (112, 12420),

Gene: Holliday\_12 Start: 7046, Stop: 7438, Start Num: 15

Candidate Starts for Holliday\_12:

(2, 6917), (4, 6962), (5, 6968), (6, 6974), (7, 6992), (9, 7010), (Start: 15 @7046 has 20 MA's), (22, 7073), (36, 7118), (38, 7124), (42, 7136), (49, 7160), (59, 7199), (61, 7205), (66, 7220), (68, 7226), (81, 7277), (85, 7289), (99, 7343),

Gene: Horus\_12 Start: 7041, Stop: 7451, Start Num: 15

Candidate Starts for Horus\_12:

(2, 6912), (4, 6957), (5, 6963), (6, 6969), (7, 6987), (Start: 15 @7041 has 20 MA's), (22, 7068), (36, 7113), (38, 7119), (49, 7173), (59, 7212), (61, 7218), (68, 7239), (81, 7290), (85, 7302),

Gene: Jabbawokkie\_14 Start: 7736, Stop: 8140, Start Num: 11

Candidate Starts for Jabbawokkie\_14:

(Start: 11 @7736 has 7 MA's), (16, 7769), (33, 7829), (51, 7895), (84, 8015), (87, 8027), (102, 8063), (108, 8093),

Gene: Jamun\_12 Start: 8669, Stop: 9112, Start Num: 13

Candidate Starts for Jamun\_12:

(Start: 13 @8669 has 29 MA's), (Start: 21 @8711 has 1 MA's), (24, 8729), (35, 8765), (50, 8819), (52, 8822), (60, 8861), (73, 8915), (85, 8954), (90, 8981), (95, 9005), (98, 9011),

Gene: JanetJ\_12 Start: 8526, Stop: 8915, Start Num: 17

Candidate Starts for JanetJ\_12:

(Start: 17 @8526 has 8 MA's), (64, 8694), (75, 8739), (78, 8751), (95, 8823), (110, 8871),

Gene: Jerole\_13 Start: 8497, Stop: 8940, Start Num: 13

Candidate Starts for Jerole\_13:

(Start: 13 @8497 has 29 MA's), (31, 8587), (35, 8593), (50, 8647), (52, 8650), (60, 8689), (90, 8809), (95, 8833), (114, 8905), (115, 8911),

Gene: Juno112\_11 Start: 7903, Stop: 8343, Start Num: 13

Candidate Starts for Juno112\_11:

(Start: 13 @7903 has 29 MA's), (22, 7954), (52, 8056), (53, 8059), (60, 8095), (62, 8101), (66, 8116), (85, 8188), (90, 8215), (114, 8314), (115, 8320), (117, 8332),

Gene: KHumphrey\_11 Start: 7902, Stop: 8342, Start Num: 13

Candidate Starts for KHumphrey\_11:

(Start: 13 @7902 has 29 MA's), (22, 7953), (52, 8055), (53, 8058), (60, 8094), (62, 8100), (66, 8115), (85, 8187), (90, 8214), (114, 8313), (115, 8319), (117, 8331),

Gene: Kamaru\_12 Start: 7046, Stop: 7438, Start Num: 15

Candidate Starts for Kamaru\_12:

(2, 6917), (4, 6962), (5, 6968), (6, 6974), (7, 6992), (9, 7010), (Start: 15 @7046 has 20 MA's), (22, 7073), (36, 7118), (38, 7124), (42, 7136), (49, 7160), (59, 7199), (61, 7205), (66, 7220), (68, 7226), (81, 7277), (85, 7289), (99, 7343),

Gene: KendraB23\_13 Start: 8492, Stop: 8932, Start Num: 13

Candidate Starts for KendraB23\_13:

(8, 8480), (Start: 13 @8492 has 29 MA's), (31, 8582), (46, 8624), (50, 8642), (52, 8645), (60, 8684), (85, 8777), (90, 8804), (95, 8828), (106, 8864), (114, 8900),

Gene: Kenna\_12 Start: 7041, Stop: 7451, Start Num: 15

Candidate Starts for Kenna\_12:

(2, 6912), (4, 6957), (5, 6963), (6, 6969), (7, 6987), (9, 7005), (Start: 15 @7041 has 20 MA's), (22, 7068), (36, 7113), (38, 7119), (49, 7173), (59, 7212), (61, 7218), (68, 7239), (81, 7290), (85, 7302),

Gene: Kepler\_12 Start: 8335, Stop: 8778, Start Num: 13

Candidate Starts for Kepler\_12:

(Start: 13 @8335 has 29 MA's), (31, 8425), (35, 8431), (50, 8485), (52, 8488), (60, 8527), (90, 8647), (95, 8671), (114, 8743), (115, 8749),

Gene: Kuleana\_12 Start: 8295, Stop: 8735, Start Num: 13

Candidate Starts for Kuleana\_12:

(Start: 13 @8295 has 29 MA's), (31, 8385), (35, 8391), (40, 8403), (52, 8448), (60, 8487), (66, 8508), (83, 8577), (85, 8580), (90, 8607), (92, 8616), (95, 8631), (114, 8703), (115, 8709),

Gene: Kumotta\_12 Start: 8443, Stop: 8820, Start Num: 17

Candidate Starts for Kumotta\_12:

(Start: 17 @8443 has 8 MA's), (58, 8584), (64, 8605), (66, 8611), (75, 8650), (89, 8707), (91, 8713), (104, 8749), (110, 8782),

Gene: Leona\_11 Start: 7953, Stop: 8393, Start Num: 13

Candidate Starts for Leona\_11:

(Start: 13 @7953 has 29 MA's), (52, 8106), (53, 8109), (60, 8145), (62, 8151), (66, 8166), (85, 8238), (90, 8265), (114, 8364), (115, 8370), (117, 8382),

Gene: Leroy\_12 Start: 7042, Stop: 7452, Start Num: 15

Candidate Starts for Leroy\_12:

(2, 6913), (4, 6958), (5, 6964), (6, 6970), (7, 6988), (Start: 15 @7042 has 20 MA's), (22, 7069), (36, 7114), (38, 7120), (49, 7174), (59, 7213), (61, 7219), (68, 7240), (81, 7291), (85, 7303),

Gene: LilSpotty\_11 Start: 7105, Stop: 7479, Start Num: 20

Candidate Starts for LilSpotty\_11:

(19, 7102), (Start: 20 @7105 has 8 MA's), (54, 7219), (55, 7222), (81, 7330), (85, 7342), (86, 7345), (96, 7384), (116, 7459),

Gene: LitninMcQueen\_12 Start: 7046, Stop: 7438, Start Num: 15

Candidate Starts for LitninMcQueen\_12:

(2, 6917), (4, 6962), (5, 6968), (6, 6974), (7, 6992), (9, 7010), (Start: 15 @7046 has 20 MA's), (22, 7073), (36, 7118), (38, 7124), (42, 7136), (49, 7160), (59, 7199), (61, 7205), (66, 7220), (68, 7226), (81, 7277), (85, 7289), (99, 7343),

Gene: LittleTokyo\_12 Start: 8235, Stop: 8678, Start Num: 13

Candidate Starts for LittleTokyo\_12:

(8, 8223), (10, 8226), (Start: 13 @8235 has 29 MA's), (66, 8448), (77, 8496), (80, 8505), (81, 8508), (85, 8520), (95, 8571), (100, 8580), (114, 8646), (117, 8664),

Gene: Lunar\_13 Start: 8497, Stop: 8940, Start Num: 13

Candidate Starts for Lunar\_13:

(Start: 13 @8497 has 29 MA's), (31, 8587), (35, 8593), (50, 8647), (52, 8650), (60, 8689), (90, 8809), (95, 8833), (114, 8905), (115, 8911),

Gene: Lutum\_12 Start: 7041, Stop: 7451, Start Num: 15

Candidate Starts for Lutum\_12:

(2, 6912), (4, 6957), (5, 6963), (6, 6969), (7, 6987), (9, 7005), (Start: 15 @7041 has 20 MA's), (22, 7068), (36, 7113), (38, 7119), (49, 7173), (59, 7212), (61, 7218), (68, 7239), (81, 7290), (85, 7302),

Gene: Maja\_11 Start: 8064, Stop: 8444, Start Num: 17

Candidate Starts for Maja\_11:

(Start: 17 @8064 has 8 MA's), (29, 8112), (42, 8142), (58, 8208), (64, 8229), (66, 8235), (91, 8337), (104, 8373), (110, 8406),

Gene: Malisha\_12 Start: 8091, Stop: 8501, Start Num: 15

Candidate Starts for Malisha\_12:

(4, 8007), (5, 8013), (Start: 15 @8091 has 20 MA's), (38, 8169), (42, 8181), (49, 8223), (59, 8262), (61, 8268), (66, 8283), (68, 8289), (77, 8328), (85, 8352), (99, 8406),

Gene: MargaretKali\_12 Start: 8078, Stop: 8455, Start Num: 17

Candidate Starts for MargaretKali\_12:

(Start: 17 @8078 has 8 MA's), (34, 8135), (58, 8219), (64, 8240), (66, 8246), (75, 8285), (89, 8342), (91, 8348), (104, 8384), (110, 8417),

Gene: Melons\_13 Start: 8497, Stop: 8940, Start Num: 13

Candidate Starts for Melons\_13:

(Start: 13 @8497 has 29 MA's), (31, 8587), (35, 8593), (50, 8647), (52, 8650), (60, 8689), (90, 8809), (95, 8833), (114, 8905), (115, 8911),

Gene: Nebkiss\_9 Start: 7643, Stop: 8014, Start Num: 20

Candidate Starts for Nebkiss\_9:

(Start: 20 @7643 has 8 MA's), (48, 7739), (54, 7760), (59, 7787), (60, 7790), (61, 7793), (66, 7808), (81, 7865), (85, 7877), (96, 7922), (111, 7982), (113, 7988), (115, 7994),

Gene: NoSwimming\_13 Start: 9693, Stop: 10082, Start Num: 17

Candidate Starts for NoSwimming\_13:

(Start: 17 @9693 has 8 MA's), (25, 9726), (64, 9861), (71, 9879), (95, 9990), (104, 10005),

Gene: Orcanus\_12 Start: 8285, Stop: 8725, Start Num: 13

Candidate Starts for Orcanus\_12:

(8, 8273), (Start: 13 @8285 has 29 MA's), (31, 8375), (46, 8417), (50, 8435), (52, 8438), (60, 8477), (85, 8570), (90, 8597), (95, 8621), (106, 8657), (114, 8693),

Gene: PFR1\_09 Start: 7693, Stop: 8106, Start Num: 18

Candidate Starts for PFR1\_09:

(18, 7693), (23, 7720), (26, 7732), (27, 7735), (39, 7771), (43, 7783), (47, 7810), (52, 7825), (57, 7849), (59, 7861), (66, 7882), (78, 7933), (87, 7963), (94, 7996),

Gene: PFR2\_09 Start: 7693, Stop: 8106, Start Num: 18

Candidate Starts for PFR2\_09:

(18, 7693), (23, 7720), (26, 7732), (27, 7735), (39, 7771), (43, 7783), (47, 7810), (52, 7825), (57, 7849), (59, 7861), (66, 7882), (78, 7933), (87, 7963), (94, 7996),

Gene: Pelletreau\_13 Start: 8491, Stop: 8931, Start Num: 13

Candidate Starts for Pelletreau\_13:

(8, 8479), (Start: 13 @8491 has 29 MA's), (31, 8581), (46, 8623), (50, 8641), (52, 8644), (60, 8683), (85, 8776), (90, 8803), (95, 8827), (106, 8863), (114, 8899),

Gene: Periwinkle\_12 Start: 7041, Stop: 7433, Start Num: 15

Candidate Starts for Periwinkle\_12:

(2, 6912), (4, 6957), (5, 6963), (6, 6969), (Start: 15 @7041 has 20 MA's), (22, 7068), (33, 7107), (36, 7113), (38, 7119), (42, 7131), (49, 7155), (59, 7194), (61, 7200), (65, 7212), (68, 7221), (81, 7272), (85, 7284),

Gene: Phabuloso\_12 Start: 7046, Stop: 7438, Start Num: 15

Candidate Starts for Phabuloso\_12:

(2, 6917), (4, 6962), (5, 6968), (6, 6974), (7, 6992), (9, 7010), (Start: 15 @7046 has 20 MA's), (22, 7073), (36, 7118), (38, 7124), (42, 7136), (49, 7160), (59, 7199), (61, 7205), (66, 7220), (68, 7226), (81, 7277), (85, 7289), (99, 7343),

Gene: Phistory\_12 Start: 7030, Stop: 7422, Start Num: 15

Candidate Starts for Phistory\_12:

(2, 6901), (4, 6946), (5, 6952), (6, 6958), (7, 6976), (9, 6994), (Start: 15 @7030 has 20 MA's), (22, 7057), (36, 7102), (38, 7108), (42, 7120), (49, 7144), (61, 7189), (66, 7204), (68, 7210), (81, 7261), (85, 7273),

Gene: PhluffyCoco\_11 Start: 7902, Stop: 8342, Start Num: 13

Candidate Starts for PhluffyCoco\_11:

(Start: 13 @7902 has 29 MA's), (22, 7953), (52, 8055), (53, 8058), (60, 8094), (62, 8100), (66, 8115), (85, 8187), (90, 8214), (114, 8313), (115, 8319), (117, 8331),

Gene: Pigu\_11 Start: 7154, Stop: 7531, Start Num: 17

Candidate Starts for Pigu\_11:

(Start: 17 @7154 has 8 MA's), (34, 7211), (42, 7229), (58, 7295), (64, 7316), (66, 7322), (91, 7424), (104, 7460), (110, 7493),

Gene: Polka\_12 Start: 8336, Stop: 8779, Start Num: 13

Candidate Starts for Polka\_12:

(Start: 13 @8336 has 29 MA's), (31, 8426), (35, 8432), (50, 8486), (52, 8489), (60, 8528), (90, 8648), (95, 8672), (114, 8744), (115, 8750),

Gene: PrairieDogTown\_18 Start: 8746, Stop: 9135, Start Num: 17

Candidate Starts for PrairieDogTown\_18:

(Start: 17 @8746 has 8 MA's), (58, 8893), (75, 8959), (78, 8971),

Gene: Rattail\_11 Start: 7953, Stop: 8393, Start Num: 13

Candidate Starts for Rattail\_11:

(Start: 13 @7953 has 29 MA's), (52, 8106), (53, 8109), (60, 8145), (62, 8151), (66, 8166), (85, 8238), (90, 8265), (114, 8364), (115, 8370), (117, 8382),

Gene: RedFox\_11 Start: 7902, Stop: 8342, Start Num: 13

Candidate Starts for RedFox\_11:

(Start: 13 @7902 has 29 MA's), (22, 7953), (52, 8055), (53, 8058), (60, 8094), (62, 8100), (66, 8115), (85, 8187), (90, 8214), (114, 8313), (115, 8319), (117, 8331),

Gene: Renna12\_12 Start: 8102, Stop: 8545, Start Num: 13

Candidate Starts for Renna12\_12:

(Start: 13 @8102 has 29 MA's), (52, 8255), (53, 8258), (60, 8294), (62, 8300), (85, 8387), (90, 8414), (95, 8438), (115, 8519), (117, 8531),

Gene: Ruchi\_12 Start: 8591, Stop: 9034, Start Num: 13

Candidate Starts for Ruchi\_12:

(Start: 13 @8591 has 29 MA's), (Start: 21 @8633 has 1 MA's), (24, 8651), (35, 8687), (50, 8741), (52, 8744), (60, 8783), (73, 8837), (85, 8876), (90, 8903), (95, 8927), (98, 8933),

Gene: Sarge\_11 Start: 7513, Stop: 7890, Start Num: 17

Candidate Starts for Sarge\_11:

(Start: 17 @7513 has 8 MA's), (53, 7627), (58, 7654), (64, 7675), (89, 7777), (91, 7783), (104, 7819), (110, 7852),

Gene: Scotia\_13 Start: 9699, Stop: 10088, Start Num: 17

Candidate Starts for Scotia\_13:

(Start: 17 @9699 has 8 MA's), (25, 9732), (64, 9867), (71, 9885), (95, 9996), (104, 10011),

Gene: ShawBrad\_12 Start: 7046, Stop: 7456, Start Num: 15

Candidate Starts for ShawBrad\_12:

(2, 6917), (4, 6962), (5, 6968), (6, 6974), (7, 6992), (Start: 15 @7046 has 20 MA's), (22, 7073), (36, 7118), (38, 7124), (49, 7178), (59, 7217), (61, 7223), (68, 7244), (81, 7295), (85, 7307),

Gene: Shoya\_10 Start: 7149, Stop: 7526, Start Num: 17

Candidate Starts for Shoya\_10:

(Start: 17 @7149 has 8 MA's), (53, 7263), (58, 7290), (64, 7311), (91, 7419), (104, 7455), (110, 7488),

Gene: Sleepyhead\_12 Start: 7869, Stop: 8279, Start Num: 21

Candidate Starts for Sleepyhead\_12:

(14, 7833), (Start: 21 @7869 has 1 MA's), (44, 7962), (53, 8004), (66, 8061), (69, 8070), (72, 8082), (81, 8124),

Gene: Soul22\_13 Start: 7212, Stop: 7616, Start Num: 11

Candidate Starts for Soul22\_13:

(Start: 11 @7212 has 7 MA's), (16, 7245), (33, 7305), (51, 7371), (84, 7491), (87, 7503), (102, 7539), (108, 7569),

Gene: Spartoi\_10 Start: 6599, Stop: 7030, Start Num: 15

Candidate Starts for Spartoi\_10:

(Start: 15 @6599 has 20 MA's), (24, 6635), (34, 6668), (36, 6674), (41, 6689), (63, 6785),



Gene: Spooky\_12 Start: 7039, Stop: 7449, Start Num: 15

Candidate Starts for Spooky\_12:

(4, 6955), (5, 6961), (6, 6967), (Start: 15 @7039 has 20 MA's), (36, 7111), (38, 7117), (42, 7129), (49, 7171), (59, 7210), (61, 7216), (68, 7237), (77, 7276), (85, 7300), (99, 7354),

Gene: Squiddly\_13 Start: 7726, Stop: 8118, Start Num: 15

Candidate Starts for Squiddly\_13:

(2, 7597), (4, 7642), (5, 7648), (6, 7654), (7, 7672), (9, 7690), (Start: 15 @7726 has 20 MA's), (22, 7753), (36, 7798), (38, 7804), (42, 7816), (49, 7840), (61, 7885), (66, 7900), (68, 7906), (81, 7957), (85, 7969),

Gene: StuartMinion\_11 Start: 7928, Stop: 8371, Start Num: 13

Candidate Starts for StuartMinion\_11:

(8, 7916), (Start: 13 @7928 has 29 MA's), (40, 8036), (53, 8084), (60, 8120), (62, 8126), (85, 8213), (90, 8240), (114, 8339), (115, 8345), (117, 8357),

Gene: TaylorSipht\_12 Start: 8370, Stop: 8810, Start Num: 13

Candidate Starts for TaylorSipht\_12:

(Start: 13 @8370 has 29 MA's), (19, 8406), (37, 8469), (52, 8523), (53, 8526), (60, 8562), (78, 8634), (82, 8646), (90, 8682), (95, 8706), (106, 8742), (114, 8778),

Gene: Toad24\_13 Start: 8492, Stop: 8932, Start Num: 13

Candidate Starts for Toad24\_13:

(8, 8480), (Start: 13 @8492 has 29 MA's), (31, 8582), (46, 8624), (50, 8642), (52, 8645), (60, 8684), (85, 8777), (90, 8804), (95, 8828), (106, 8864), (114, 8900),

Gene: Typha\_18 Start: 11994, Stop: 12434, Start Num: 12

Candidate Starts for Typha\_18:

(Start: 12 @11994 has 4 MA's), (Start: 13 @11997 has 29 MA's), (28, 12075), (30, 12084), (32, 12090), (35, 12096), (56, 12174), (74, 12240), (85, 12276), (105, 12351), (112, 12390),

Gene: Vulpecula\_12 Start: 8667, Stop: 9110, Start Num: 13

Candidate Starts for Vulpecula\_12:

(Start: 13 @8667 has 29 MA's), (Start: 21 @8709 has 1 MA's), (24, 8727), (35, 8763), (50, 8817), (52, 8820), (60, 8859), (73, 8913), (85, 8952), (90, 8979), (95, 9003), (98, 9009),

Gene: Westrich\_13 Start: 8480, Stop: 8920, Start Num: 13

Candidate Starts for Westrich\_13:

(8, 8468), (Start: 13 @8480 has 29 MA's), (31, 8570), (46, 8612), (50, 8630), (52, 8633), (60, 8672), (85, 8765), (90, 8792), (95, 8816), (106, 8852), (114, 8888),

Gene: Whitney\_12 Start: 7041, Stop: 7433, Start Num: 15

Candidate Starts for Whitney\_12:

(2, 6912), (4, 6957), (5, 6963), (6, 6969), (7, 6987), (Start: 15 @7041 has 20 MA's), (22, 7068), (33, 7107), (36, 7113), (38, 7119), (42, 7131), (49, 7155), (59, 7194), (61, 7200), (65, 7212), (68, 7221), (81, 7272), (85, 7284),

Gene: Yoshi\_13 Start: 7212, Stop: 7616, Start Num: 11

Candidate Starts for Yoshi\_13:

(Start: 11 @7212 has 7 MA's), (16, 7245), (33, 7305), (51, 7371), (84, 7491), (87, 7503), (102, 7539), (108, 7569),

Gene: Zapner\_14 Start: 7737, Stop: 8141, Start Num: 11

Candidate Starts for Zapner\_14:

(Start: 11 @7737 has 7 MA's), (16, 7770), (33, 7830), (51, 7896), (84, 8016), (87, 8028), (102, 8064), (108, 8094),

Gene: Zhuangyuan\_14 Start: 8650, Stop: 9102, Start Num: 10

Candidate Starts for Zhuangyuan\_14:

(8, 8647), (10, 8650), (Start: 13 @8659 has 29 MA's), (22, 8710), (37, 8758), (80, 8929), (81, 8932), (95, 8995), (100, 9004), (106, 9034), (117, 9088),