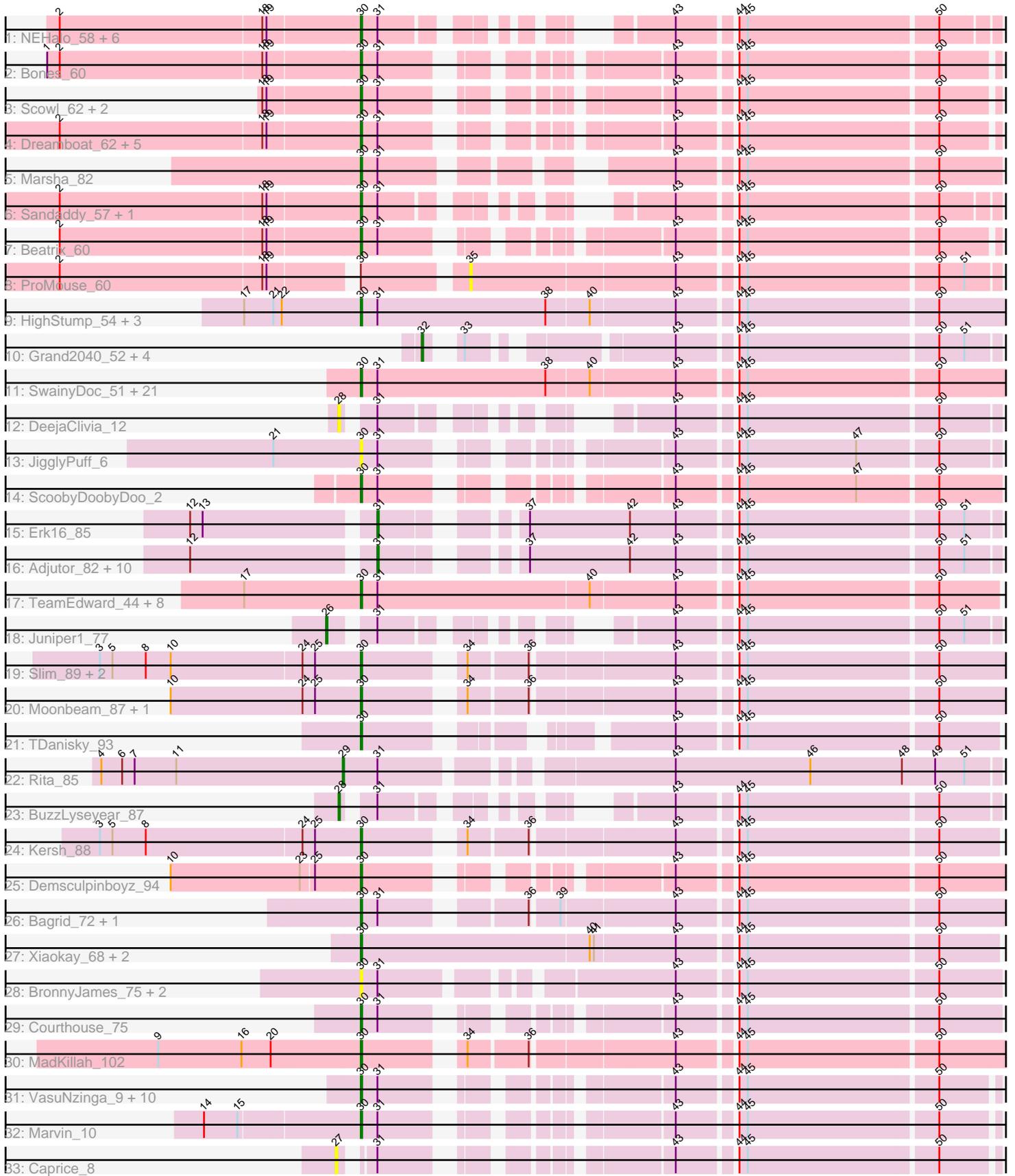


Pham 282094



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 282094 Report

This analysis was run 02/23/26 on database version 636.

Pham number 282094 has 111 members, 22 are drafts.

Phages represented in each track:

- Track 1 : NEHalo\_58, AFIS\_57, Blackflame\_57, SpikeBT\_59, GageAP\_62, Pollywog\_86, Makemake\_63
- Track 2 : Bones\_60
- Track 3 : Scowl\_62, StrongArm\_59, Bexan\_58
- Track 4 : Dreamboat\_62, Cueyllyss\_61, Ohno789\_61, Graduation\_65, PherrisBueller\_60, Jasper\_61
- Track 5 : Marsha\_82
- Track 6 : Sandaddy\_57, Sorpresa\_58
- Track 7 : Beatrix\_60
- Track 8 : ProMouse\_60
- Track 9 : HighStump\_54, Iridessa\_53, Longacauda\_53, Legolas\_54
- Track 10 : Grand2040\_52, LeiMonet\_54, Cosmolli16\_53, Giraffe\_53, Maru\_52
- Track 11 : SwainyDoc\_51, DaddyDaniels\_54, Chentzyk\_51, Rita1961\_51, Kronus\_50, Childish\_52, MmasiCarm\_51, Obutu\_51, Soile\_53, Phayeta\_52, Mortcellus\_50, Brilliant\_54, Kahve\_52, Casbah\_50, Ben11\_50, Gervas\_51, HenryJackson\_52, Marlia\_51, Craff\_55, Mulaychimus\_51, TinyTerror\_51, SlippinJimmy\_52
- Track 12 : DeejaClivia\_12
- Track 13 : JigglyPuff\_6
- Track 14 : ScoobyDoobyDoo\_2
- Track 15 : Erk16\_85
- Track 16 : Adjutor\_82, PLOT\_85, Visconti\_85, Thoth\_84, WaldoWhy\_85, Butterscotch\_82, Mopey\_86, Giuseppe\_86, Chill\_85, Prager\_84, Penelope2018\_84
- Track 17 : TeamEdward\_44, StormChicken\_44, Nala\_43, MPhalcon\_42, MISSy\_42, Becksu\_43, Rimmer\_43, Buck\_43, Youngblood\_44
- Track 18 : Juniper1\_77
- Track 19 : Slim\_89, Emmaloid\_89, Sabbb\_88
- Track 20 : Moonbeam\_87, Rialto\_90
- Track 21 : TDanisky\_93
- Track 22 : Rita\_85
- Track 23 : BuzzLyseyear\_87
- Track 24 : Kersh\_88
- Track 25 : Demsculpinboyz\_94
- Track 26 : Bagrid\_72, EricMillard\_72
- Track 27 : Xiaokay\_68, Thibault\_65, Constella\_64
- Track 28 : BronnyJames\_75, Nibley\_68, Shaboozey\_74
- Track 29 : Courthouse\_75

- Track 30 : MadKillah\_102
- Track 31 : VasuNzinga\_9, Latretium\_78, MrPhizzler\_54, BoogieWoogie\_53, RedRaider77\_10, DolOn\_56, Rimu\_53, Fringe\_56, Lumine\_53, Khan1\_53, Gwilliam\_53
- Track 32 : Marvin\_10
- Track 33 : Caprice\_8

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

The start number called the most often in the published annotations is 30, it was called in 70 of the 89 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AFIS\_57, Bagrid\_72, Beatrix\_60, Becksu\_43, Ben11\_50, Bexan\_58, Blackflame\_57, Bones\_60, BoogieWoogie\_53, Brilliant\_54, BronnyJames\_75, Buck\_43, Casbah\_50, Chentzyk\_51, Childish\_52, Constella\_64, Courthouse\_75, Craff\_55, Cueylyss\_61, DaddyDaniels\_54, Demsculpinboyz\_94, DolOn\_56, Dreamboat\_62, Emmaloid\_89, EricMillard\_72, Fringe\_56, GageAP\_62, Gervas\_51, Graduation\_65, Gwilliam\_53, HenryJackson\_52, HighStump\_54, Iridessa\_53, Jasper\_61, JigglyPuff\_6, Kahve\_52, Kersh\_88, Khan1\_53, Kronus\_50, Latretium\_78, Legolas\_54, Longacauda\_53, Lumine\_53, MISSy\_42, MPhalcon\_42, MadKillah\_102, Makemake\_63, Marlia\_51, Marsha\_82, Marvin\_10, MmasiCarm\_51, Moonbeam\_87, Mortcellus\_50, MrPhizzler\_54, Mulaychimus\_51, NEHalo\_58, Nala\_43, Nibley\_68, Obutu\_51, Ohno789\_61, Phayeta\_52, PherrisBueller\_60, Pollywog\_86, RedRaider77\_10, Rialto\_90, Rimmer\_43, Rimu\_53, Rita1961\_51, Sabbb\_88, Sandaddy\_57, ScoobyDoobyDoo\_2, Scowl\_62, Shaboozey\_74, Slim\_89, SlippinJimmy\_52, Soile\_53, Sorpresa\_58, SpikeBT\_59, StormChicken\_44, StrongArm\_59, SwainyDoc\_51, TDanisky\_93, TeamEdward\_44, Thibault\_65, TinyTerror\_51, VasuNzinga\_9, Xiaokay\_68, Youngblood\_44,

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

- ProMouse\_60,

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

- Adjutor\_82, Butterscotch\_82, BuzzLyseyear\_87, Caprice\_8, Chill\_85, Cosmolli16\_53, DeejaClivia\_12, Erk16\_85, Giraffe\_53, Giuseppe\_86, Grand2040\_52, Juniper1\_77, LeiMonet\_54, Maru\_52, Mopey\_86, PLot\_85, Penelope2018\_84, Prager\_84, Rita\_85, Thoth\_84, Visconti\_85, WaldoWhy\_85,

**Summary by start number:**

Start 26:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Juniper1\_77 (F1),

Start 27:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- No Manual Annotations of this start.

- Called 100.0% of time when present
- Phage (with cluster) where this start called: Caprice\_8 (S),

#### Start 28:

- Found in 2 of 111 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BuzzLyseyear\_87 (F1), DeejaClivia\_12 (C1),

#### Start 29:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Rita\_85 (F1),

#### Start 30:

- Found in 89 of 111 ( 80.2% ) of genes in pham
- Manual Annotations of this start: 70 of 89
- Called 98.9% of time when present
- Phage (with cluster) where this start called: AFIS\_57 (A1), Bagrid\_72 (J), Beatrix\_60 (A1), Becksu\_43 (E), Ben11\_50 (B3), Bexan\_58 (A1), Blackflame\_57 (A1), Bones\_60 (A1), BoogieWoogie\_53 (B1), Brilliant\_54 (B1), BronnyJames\_75 (J), Buck\_43 (E), Casbah\_50 (B3), Chentzyk\_51 (B3), Childish\_52 (B1), Constella\_64 (J), Courthouse\_75 (J), Craff\_55 (B1), Cueylyss\_61 (A1), DaddyDaniels\_54 (B1), Demsculpinboyz\_94 (F2), DolOn\_56 (B1), Dreamboat\_62 (A1), Emmaloid\_89 (F1), EricMillard\_72 (J), Fringe\_56 (B1), GageAP\_62 (A1), Gervas\_51 (B3), Graduation\_65 (A1), Gwilliam\_53 (B1), HenryJackson\_52 (B1), HighStump\_54 (B1), Iridessa\_53 (B1), Jasper\_61 (A1), JigglyPuff\_6 (C1), Kahve\_52 (B1), Kersh\_88 (F1), Khan1\_53 (B1), Kronus\_50 (B3), Latretium\_78 (F1), Legolas\_54 (B1), Longacauda\_53 (B1), Lumine\_53 (B1), MISSy\_42 (E), MPhalcon\_42 (E), MadKillah\_102 (O), Makemake\_63 (A1), Marlia\_51 (B3), Marsha\_82 (A1), Marvin\_10 (S), MmasiCarm\_51 (B3), Moonbeam\_87 (F1), Mortcellus\_50 (B3), MrPhizzler\_54 (B1), Mulaychimus\_51 (B3), NEHalo\_58 (A1), Nala\_43 (E), Nibley\_68 (J), Obutu\_51 (B3), Ohno789\_61 (A1), Phayeta\_52 (B3), PherrisBueller\_60 (A1), Pollywog\_86 (F1), RedRaider77\_10 (S), Rialto\_90 (F1), Rimmer\_43 (E), Rimu\_53 (B1), Rita1961\_51 (B3), Sabbb\_88 (F1), Sandaddy\_57 (A1), ScoobyDoobyDoo\_2 (C2), Scowl\_62 (A1), Shaboozey\_74 (J), Slim\_89 (F1), SlippinJimmy\_52 (B3), Soile\_53 (B1), Sorpresa\_58 (A1), SpikeBT\_59 (A1), StormChicken\_44 (E), StrongArm\_59 (A1), SwainyDoc\_51 (B3), TDanisky\_93 (F1), TeamEdward\_44 (E), Thibault\_65 (J), TinyTerror\_51 (B3), VasuNzinga\_9 (S), Xiaokay\_68 (J), Youngblood\_44 (E),

#### Start 31:

- Found in 93 of 111 ( 83.8% ) of genes in pham
- Manual Annotations of this start: 12 of 89
- Called 12.9% of time when present
- Phage (with cluster) where this start called: Adjutor\_82 (D1), Butterscotch\_82 (D1), Chill\_85 (D1), Erk16\_85 (D1), Giuseppe\_86 (D1), Mopey\_86 (D1), PLOT\_85 (D1), Penelope2018\_84 (D1), Prager\_84 (D1), Thoth\_84 (D1), Visconti\_85 (D1), WaldoWhy\_85 (D1),

#### Start 32:

- Found in 5 of 111 ( 4.5% ) of genes in pham

- Manual Annotations of this start: 4 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cosmolli16\_53 (B1), Giraffe\_53 (B1), Grand2040\_52 (B1), LeiMonet\_54 (B1), Maru\_52 (B1),

Start 35:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ProMouse\_60 (A1),

### **Summary by clusters:**

There are 12 clusters represented in this pham: F1, F2, E, J, O, A1, S, B1, B3, C2, C1, D1,

Info for manual annotations of cluster A1:

- Start number 30 was manually annotated 18 times for cluster A1.

Info for manual annotations of cluster B1:

- Start number 30 was manually annotated 16 times for cluster B1.
- Start number 32 was manually annotated 4 times for cluster B1.

Info for manual annotations of cluster B3:

- Start number 30 was manually annotated 11 times for cluster B3.

Info for manual annotations of cluster C2:

- Start number 30 was manually annotated 1 time for cluster C2.

Info for manual annotations of cluster D1:

- Start number 31 was manually annotated 12 times for cluster D1.

Info for manual annotations of cluster E:

- Start number 30 was manually annotated 6 times for cluster E.

Info for manual annotations of cluster F1:

- Start number 26 was manually annotated 1 time for cluster F1.
- Start number 28 was manually annotated 1 time for cluster F1.
- Start number 29 was manually annotated 1 time for cluster F1.
- Start number 30 was manually annotated 9 times for cluster F1.

Info for manual annotations of cluster F2:

- Start number 30 was manually annotated 1 time for cluster F2.

Info for manual annotations of cluster J:

- Start number 30 was manually annotated 4 times for cluster J.

Info for manual annotations of cluster O:

- Start number 30 was manually annotated 1 time for cluster O.

Info for manual annotations of cluster S:

- Start number 30 was manually annotated 3 times for cluster S.

**Gene Information:**

Gene: AFIS\_57 Start: 39716, Stop: 39357, Start Num: 30

Candidate Starts for AFIS\_57:

(2, 39917), (18, 39773), (19, 39770), (Start: 30 @39716 has 70 MA's), (Start: 31 @39704 has 12 MA's), (43, 39569), (44, 39533), (45, 39527), (50, 39395),

Gene: Adjutor\_82 Start: 59655, Stop: 60050, Start Num: 31

Candidate Starts for Adjutor\_82:

(12, 59532), (Start: 31 @59655 has 12 MA's), (37, 59730), (42, 59802), (43, 59835), (44, 59871), (45, 59877), (50, 60009), (51, 60027),

Gene: Bagrid\_72 Start: 50124, Stop: 49711, Start Num: 30

Candidate Starts for Bagrid\_72:

(Start: 30 @50124 has 70 MA's), (Start: 31 @50112 has 12 MA's), (36, 50028), (39, 50010), (43, 49932), (44, 49896), (45, 49890), (50, 49758),

Gene: Beatrix\_60 Start: 41870, Stop: 41490, Start Num: 30

Candidate Starts for Beatrix\_60:

(2, 42071), (18, 41927), (19, 41924), (Start: 30 @41870 has 70 MA's), (Start: 31 @41858 has 12 MA's), (43, 41702), (44, 41666), (45, 41660), (50, 41528),

Gene: Becksu\_43 Start: 35704, Stop: 35261, Start Num: 30

Candidate Starts for Becksu\_43:

(17, 35776), (Start: 30 @35704 has 70 MA's), (Start: 31 @35692 has 12 MA's), (40, 35542), (43, 35482), (44, 35446), (45, 35440), (50, 35308),

Gene: Ben11\_50 Start: 45429, Stop: 44986, Start Num: 30

Candidate Starts for Ben11\_50:

(Start: 30 @45429 has 70 MA's), (Start: 31 @45417 has 12 MA's), (38, 45297), (40, 45267), (43, 45207), (44, 45171), (45, 45165), (50, 45033),

Gene: Bexan\_58 Start: 41649, Stop: 41269, Start Num: 30

Candidate Starts for Bexan\_58:

(18, 41706), (19, 41703), (Start: 30 @41649 has 70 MA's), (Start: 31 @41637 has 12 MA's), (43, 41481), (44, 41445), (45, 41439), (50, 41307),

Gene: Blackflame\_57 Start: 40484, Stop: 40125, Start Num: 30

Candidate Starts for Blackflame\_57:

(2, 40685), (18, 40541), (19, 40538), (Start: 30 @40484 has 70 MA's), (Start: 31 @40472 has 12 MA's), (43, 40337), (44, 40301), (45, 40295), (50, 40163),

Gene: Bones\_60 Start: 41965, Stop: 41585, Start Num: 30

Candidate Starts for Bones\_60:

(1, 42175), (2, 42166), (18, 42022), (19, 42019), (Start: 30 @41965 has 70 MA's), (Start: 31 @41953 has 12 MA's), (43, 41797), (44, 41761), (45, 41755), (50, 41623),

Gene: BoogieWoogie\_53 Start: 47371, Stop: 46982, Start Num: 30

Candidate Starts for BoogieWoogie\_53:

(Start: 30 @47371 has 70 MA's), (Start: 31 @47359 has 12 MA's), (43, 47203), (44, 47167), (45, 47161), (50, 47029),

Gene: Brilliant\_54 Start: 47338, Stop: 46895, Start Num: 30

Candidate Starts for Brilliant\_54:

(Start: 30 @47338 has 70 MA's), (Start: 31 @47326 has 12 MA's), (38, 47206), (40, 47176), (43, 47116), (44, 47080), (45, 47074), (50, 46942),

Gene: BronnyJames\_75 Start: 47278, Stop: 46868, Start Num: 30

Candidate Starts for BronnyJames\_75:

(Start: 30 @47278 has 70 MA's), (Start: 31 @47266 has 12 MA's), (43, 47086), (44, 47050), (45, 47044), (50, 46912),

Gene: Buck\_43 Start: 35755, Stop: 35318, Start Num: 30

Candidate Starts for Buck\_43:

(17, 35827), (Start: 30 @35755 has 70 MA's), (Start: 31 @35743 has 12 MA's), (40, 35593), (43, 35533), (44, 35497), (45, 35491), (50, 35359),

Gene: Butterscotch\_82 Start: 59706, Stop: 60101, Start Num: 31

Candidate Starts for Butterscotch\_82:

(12, 59583), (Start: 31 @59706 has 12 MA's), (37, 59781), (42, 59853), (43, 59886), (44, 59922), (45, 59928), (50, 60060), (51, 60078),

Gene: BuzzLyseyear\_87 Start: 51492, Stop: 51857, Start Num: 28

Candidate Starts for BuzzLyseyear\_87:

(Start: 28 @51492 has 1 MA's), (Start: 31 @51507 has 12 MA's), (43, 51642), (44, 51678), (45, 51684), (50, 51816),

Gene: Caprice\_8 Start: 2539, Stop: 2922, Start Num: 27

Candidate Starts for Caprice\_8:

(27, 2539), (Start: 31 @2554 has 12 MA's), (43, 2710), (44, 2746), (45, 2752), (50, 2884),

Gene: Casbah\_50 Start: 45459, Stop: 45016, Start Num: 30

Candidate Starts for Casbah\_50:

(Start: 30 @45459 has 70 MA's), (Start: 31 @45447 has 12 MA's), (38, 45327), (40, 45297), (43, 45237), (44, 45201), (45, 45195), (50, 45063),

Gene: Chentzyk\_51 Start: 45971, Stop: 45528, Start Num: 30

Candidate Starts for Chentzyk\_51:

(Start: 30 @45971 has 70 MA's), (Start: 31 @45959 has 12 MA's), (38, 45839), (40, 45809), (43, 45749), (44, 45713), (45, 45707), (50, 45575),

Gene: Childish\_52 Start: 47365, Stop: 46922, Start Num: 30

Candidate Starts for Childish\_52:

(Start: 30 @47365 has 70 MA's), (Start: 31 @47353 has 12 MA's), (38, 47233), (40, 47203), (43, 47143), (44, 47107), (45, 47101), (50, 46969),

Gene: Chill\_85 Start: 59683, Stop: 60078, Start Num: 31

Candidate Starts for Chill\_85:

(12, 59560), (Start: 31 @59683 has 12 MA's), (37, 59758), (42, 59830), (43, 59863), (44, 59899), (45, 59905), (50, 60037), (51, 60055),

Gene: Constella\_64 Start: 46367, Stop: 45930, Start Num: 30

Candidate Starts for Constella\_64:

(Start: 30 @46367 has 70 MA's), (40, 46205), (41, 46202), (43, 46145), (44, 46109), (45, 46103), (50, 45971),

Gene: Cosmolli16\_53 Start: 47545, Stop: 47198, Start Num: 32

Candidate Starts for Cosmolli16\_53:

(Start: 32 @47545 has 4 MA's), (33, 47533), (43, 47413), (44, 47377), (45, 47371), (50, 47239), (51, 47221),

Gene: Courthouse\_75 Start: 48166, Stop: 47780, Start Num: 30

Candidate Starts for Courthouse\_75:

(Start: 30 @48166 has 70 MA's), (Start: 31 @48154 has 12 MA's), (43, 47998), (44, 47962), (45, 47956), (50, 47824),

Gene: Craff\_55 Start: 47790, Stop: 47347, Start Num: 30

Candidate Starts for Craff\_55:

(Start: 30 @47790 has 70 MA's), (Start: 31 @47778 has 12 MA's), (38, 47658), (40, 47628), (43, 47568), (44, 47532), (45, 47526), (50, 47394),

Gene: Cueylyss\_61 Start: 42165, Stop: 41785, Start Num: 30

Candidate Starts for Cueylyss\_61:

(2, 42366), (18, 42222), (19, 42219), (Start: 30 @42165 has 70 MA's), (Start: 31 @42153 has 12 MA's), (43, 41997), (44, 41961), (45, 41955), (50, 41823),

Gene: DaddyDaniels\_54 Start: 47322, Stop: 46879, Start Num: 30

Candidate Starts for DaddyDaniels\_54:

(Start: 30 @47322 has 70 MA's), (Start: 31 @47310 has 12 MA's), (38, 47190), (40, 47160), (43, 47100), (44, 47064), (45, 47058), (50, 46926),

Gene: DeejaClivia\_12 Start: 3961, Stop: 4326, Start Num: 28

Candidate Starts for DeejaClivia\_12:

(Start: 28 @3961 has 1 MA's), (Start: 31 @3976 has 12 MA's), (43, 4111), (44, 4147), (45, 4153), (50, 4285),

Gene: Demsculpinboyz\_94 Start: 48157, Stop: 48546, Start Num: 30

Candidate Starts for Demsculpinboyz\_94:

(10, 48034), (23, 48127), (25, 48136), (Start: 30 @48157 has 70 MA's), (43, 48325), (44, 48361), (45, 48367), (50, 48499),

Gene: DolOn\_56 Start: 48048, Stop: 47668, Start Num: 30

Candidate Starts for DolOn\_56:

(Start: 30 @48048 has 70 MA's), (Start: 31 @48036 has 12 MA's), (43, 47880), (44, 47844), (45, 47838), (50, 47706),

Gene: Dreamboat\_62 Start: 40065, Stop: 39685, Start Num: 30

Candidate Starts for Dreamboat\_62:

(2, 40266), (18, 40122), (19, 40119), (Start: 30 @40065 has 70 MA's), (Start: 31 @40053 has 12 MA's), (43, 39897), (44, 39861), (45, 39855), (50, 39723),

Gene: Emmaloid\_89 Start: 50002, Stop: 50415, Start Num: 30

Candidate Starts for Emmaloid\_89:

(3, 49828), (5, 49837), (8, 49861), (10, 49879), (24, 49972), (25, 49981), (Start: 30 @50002 has 70 MA's), (34, 50059), (36, 50098), (43, 50194), (44, 50230), (45, 50236), (50, 50368),

Gene: EricMillard\_72 Start: 50977, Stop: 50564, Start Num: 30

Candidate Starts for EricMillard\_72:

(Start: 30 @50977 has 70 MA's), (Start: 31 @50965 has 12 MA's), (36, 50881), (39, 50863), (43, 50785), (44, 50749), (45, 50743), (50, 50611),

Gene: Erk16\_85 Start: 60039, Stop: 60434, Start Num: 31

Candidate Starts for Erk16\_85:

(12, 59916), (13, 59925), (Start: 31 @60039 has 12 MA's), (37, 60114), (42, 60186), (43, 60219), (44, 60255), (45, 60261), (50, 60393), (51, 60411),

Gene: Fringe\_56 Start: 48267, Stop: 47878, Start Num: 30

Candidate Starts for Fringe\_56:

(Start: 30 @48267 has 70 MA's), (Start: 31 @48255 has 12 MA's), (43, 48099), (44, 48063), (45, 48057), (50, 47925),

Gene: GageAP\_62 Start: 41383, Stop: 41024, Start Num: 30

Candidate Starts for GageAP\_62:

(2, 41584), (18, 41440), (19, 41437), (Start: 30 @41383 has 70 MA's), (Start: 31 @41371 has 12 MA's), (43, 41236), (44, 41200), (45, 41194), (50, 41062),

Gene: Gervas\_51 Start: 45588, Stop: 45145, Start Num: 30

Candidate Starts for Gervas\_51:

(Start: 30 @45588 has 70 MA's), (Start: 31 @45576 has 12 MA's), (38, 45456), (40, 45426), (43, 45366), (44, 45330), (45, 45324), (50, 45192),

Gene: Giraffe\_53 Start: 47326, Stop: 46979, Start Num: 32

Candidate Starts for Giraffe\_53:

(Start: 32 @47326 has 4 MA's), (33, 47314), (43, 47194), (44, 47158), (45, 47152), (50, 47020), (51, 47002),

Gene: Giuseppe\_86 Start: 59752, Stop: 60147, Start Num: 31

Candidate Starts for Giuseppe\_86:

(12, 59629), (Start: 31 @59752 has 12 MA's), (37, 59827), (42, 59899), (43, 59932), (44, 59968), (45, 59974), (50, 60106), (51, 60124),

Gene: Graduation\_65 Start: 42237, Stop: 41857, Start Num: 30

Candidate Starts for Graduation\_65:

(2, 42438), (18, 42294), (19, 42291), (Start: 30 @42237 has 70 MA's), (Start: 31 @42225 has 12 MA's), (43, 42069), (44, 42033), (45, 42027), (50, 41895),

Gene: Grand2040\_52 Start: 47320, Stop: 46973, Start Num: 32

Candidate Starts for Grand2040\_52:

(Start: 32 @47320 has 4 MA's), (33, 47308), (43, 47188), (44, 47152), (45, 47146), (50, 47014), (51, 46996),

Gene: Gwilliam\_53 Start: 47683, Stop: 47303, Start Num: 30

Candidate Starts for Gwilliam\_53:

(Start: 30 @47683 has 70 MA's), (Start: 31 @47671 has 12 MA's), (43, 47515), (44, 47479), (45, 47473), (50, 47341),

Gene: HenryJackson\_52 Start: 47354, Stop: 46911, Start Num: 30

Candidate Starts for HenryJackson\_52:

(Start: 30 @47354 has 70 MA's), (Start: 31 @47342 has 12 MA's), (38, 47222), (40, 47192), (43, 47132), (44, 47096), (45, 47090), (50, 46958),

Gene: HighStump\_54 Start: 47890, Stop: 47447, Start Num: 30

Candidate Starts for HighStump\_54:

(17, 47962), (21, 47941), (22, 47935), (Start: 30 @47890 has 70 MA's), (Start: 31 @47878 has 12 MA's), (38, 47758), (40, 47728), (43, 47668), (44, 47632), (45, 47626), (50, 47494),

Gene: Iridessa\_53 Start: 47334, Stop: 46891, Start Num: 30

Candidate Starts for Iridessa\_53:

(17, 47406), (21, 47385), (22, 47379), (Start: 30 @47334 has 70 MA's), (Start: 31 @47322 has 12 MA's), (38, 47202), (40, 47172), (43, 47112), (44, 47076), (45, 47070), (50, 46938),

Gene: Jasper\_61 Start: 39951, Stop: 39571, Start Num: 30

Candidate Starts for Jasper\_61:

(2, 40152), (18, 40008), (19, 40005), (Start: 30 @39951 has 70 MA's), (Start: 31 @39939 has 12 MA's), (43, 39783), (44, 39747), (45, 39741), (50, 39609),

Gene: JigglyPuff\_6 Start: 1982, Stop: 2365, Start Num: 30

Candidate Starts for JigglyPuff\_6:

(21, 1931), (Start: 30 @1982 has 70 MA's), (Start: 31 @1994 has 12 MA's), (43, 2150), (44, 2186), (45, 2192), (47, 2270), (50, 2324),

Gene: Juniper1\_77 Start: 47775, Stop: 48149, Start Num: 26

Candidate Starts for Juniper1\_77:

(Start: 26 @47775 has 1 MA's), (Start: 31 @47799 has 12 MA's), (43, 47934), (44, 47970), (45, 47976), (50, 48108), (51, 48126),

Gene: Kahve\_52 Start: 47351, Stop: 46908, Start Num: 30

Candidate Starts for Kahve\_52:

(Start: 30 @47351 has 70 MA's), (Start: 31 @47339 has 12 MA's), (38, 47219), (40, 47189), (43, 47129), (44, 47093), (45, 47087), (50, 46955),

Gene: Kersh\_88 Start: 52115, Stop: 52522, Start Num: 30

Candidate Starts for Kersh\_88:

(3, 51941), (5, 51950), (8, 51974), (24, 52085), (25, 52094), (Start: 30 @52115 has 70 MA's), (34, 52172), (36, 52211), (43, 52307), (44, 52343), (45, 52349), (50, 52481),

Gene: Khan1\_53 Start: 47307, Stop: 46918, Start Num: 30

Candidate Starts for Khan1\_53:

(Start: 30 @47307 has 70 MA's), (Start: 31 @47295 has 12 MA's), (43, 47139), (44, 47103), (45, 47097), (50, 46965),

Gene: Kronus\_50 Start: 46191, Stop: 45748, Start Num: 30

Candidate Starts for Kronus\_50:

(Start: 30 @46191 has 70 MA's), (Start: 31 @46179 has 12 MA's), (38, 46059), (40, 46029), (43, 45969), (44, 45933), (45, 45927), (50, 45795),

Gene: Latretium\_78 Start: 47174, Stop: 47560, Start Num: 30

Candidate Starts for Latretium\_78:

(Start: 30 @47174 has 70 MA's), (Start: 31 @47186 has 12 MA's), (43, 47342), (44, 47378), (45, 47384), (50, 47516),

Gene: Legolas\_54 Start: 47787, Stop: 47344, Start Num: 30  
Candidate Starts for Legolas\_54:  
(17, 47859), (21, 47838), (22, 47832), (Start: 30 @47787 has 70 MA's), (Start: 31 @47775 has 12 MA's), (38, 47655), (40, 47625), (43, 47565), (44, 47529), (45, 47523), (50, 47391),

Gene: LeiMonet\_54 Start: 47306, Stop: 46959, Start Num: 32  
Candidate Starts for LeiMonet\_54:  
(Start: 32 @47306 has 4 MA's), (33, 47294), (43, 47174), (44, 47138), (45, 47132), (50, 47000), (51, 46982),

Gene: Longacauda\_53 Start: 47750, Stop: 47307, Start Num: 30  
Candidate Starts for Longacauda\_53:  
(17, 47822), (21, 47801), (22, 47795), (Start: 30 @47750 has 70 MA's), (Start: 31 @47738 has 12 MA's), (38, 47618), (40, 47588), (43, 47528), (44, 47492), (45, 47486), (50, 47354),

Gene: Lumine\_53 Start: 47538, Stop: 47155, Start Num: 30  
Candidate Starts for Lumine\_53:  
(Start: 30 @47538 has 70 MA's), (Start: 31 @47526 has 12 MA's), (43, 47370), (44, 47334), (45, 47328), (50, 47196),

Gene: MISSy\_42 Start: 35034, Stop: 34591, Start Num: 30  
Candidate Starts for MISSy\_42:  
(17, 35106), (Start: 30 @35034 has 70 MA's), (Start: 31 @35022 has 12 MA's), (40, 34872), (43, 34812), (44, 34776), (45, 34770), (50, 34638),

Gene: MPhalcon\_42 Start: 35027, Stop: 34584, Start Num: 30  
Candidate Starts for MPhalcon\_42:  
(17, 35099), (Start: 30 @35027 has 70 MA's), (Start: 31 @35015 has 12 MA's), (40, 34865), (43, 34805), (44, 34769), (45, 34763), (50, 34631),

Gene: MadKillah\_102 Start: 61818, Stop: 61405, Start Num: 30  
Candidate Starts for MadKillah\_102:  
(9, 61950), (16, 61890), (20, 61869), (Start: 30 @61818 has 70 MA's), (34, 61761), (36, 61722), (43, 61626), (44, 61590), (45, 61584), (50, 61452),

Gene: Makemake\_63 Start: 42339, Stop: 41959, Start Num: 30  
Candidate Starts for Makemake\_63:  
(2, 42540), (18, 42396), (19, 42393), (Start: 30 @42339 has 70 MA's), (Start: 31 @42327 has 12 MA's), (43, 42171), (44, 42135), (45, 42129), (50, 41997),

Gene: Marlia\_51 Start: 45592, Stop: 45149, Start Num: 30  
Candidate Starts for Marlia\_51:  
(Start: 30 @45592 has 70 MA's), (Start: 31 @45580 has 12 MA's), (38, 45460), (40, 45430), (43, 45370), (44, 45334), (45, 45328), (50, 45196),

Gene: Marsha\_82 Start: 50494, Stop: 50108, Start Num: 30  
Candidate Starts for Marsha\_82:  
(Start: 30 @50494 has 70 MA's), (Start: 31 @50482 has 12 MA's), (43, 50326), (44, 50290), (45, 50284), (50, 50152),

Gene: Maru\_52 Start: 47257, Stop: 46910, Start Num: 32  
Candidate Starts for Maru\_52:

(Start: 32 @47257 has 4 MA's), (33, 47245), (43, 47125), (44, 47089), (45, 47083), (50, 46951), (51, 46933),

Gene: Marvin\_10 Start: 3597, Stop: 3977, Start Num: 30

Candidate Starts for Marvin\_10:

(14, 3501), (15, 3525), (Start: 30 @3597 has 70 MA's), (Start: 31 @3609 has 12 MA's), (43, 3765), (44, 3801), (45, 3807), (50, 3939),

Gene: MmasiCarm\_51 Start: 45638, Stop: 45195, Start Num: 30

Candidate Starts for MmasiCarm\_51:

(Start: 30 @45638 has 70 MA's), (Start: 31 @45626 has 12 MA's), (38, 45506), (40, 45476), (43, 45416), (44, 45380), (45, 45374), (50, 45242),

Gene: Moonbeam\_87 Start: 50558, Stop: 50971, Start Num: 30

Candidate Starts for Moonbeam\_87:

(10, 50435), (24, 50528), (25, 50537), (Start: 30 @50558 has 70 MA's), (34, 50615), (36, 50654), (43, 50750), (44, 50786), (45, 50792), (50, 50924),

Gene: Mopey\_86 Start: 59779, Stop: 60174, Start Num: 31

Candidate Starts for Mopey\_86:

(12, 59656), (Start: 31 @59779 has 12 MA's), (37, 59854), (42, 59926), (43, 59959), (44, 59995), (45, 60001), (50, 60133), (51, 60151),

Gene: Mortcellus\_50 Start: 46245, Stop: 45802, Start Num: 30

Candidate Starts for Mortcellus\_50:

(Start: 30 @46245 has 70 MA's), (Start: 31 @46233 has 12 MA's), (38, 46113), (40, 46083), (43, 46023), (44, 45987), (45, 45981), (50, 45849),

Gene: MrPhizzler\_54 Start: 47284, Stop: 46895, Start Num: 30

Candidate Starts for MrPhizzler\_54:

(Start: 30 @47284 has 70 MA's), (Start: 31 @47272 has 12 MA's), (43, 47116), (44, 47080), (45, 47074), (50, 46942),

Gene: Mulaychimus\_51 Start: 45574, Stop: 45131, Start Num: 30

Candidate Starts for Mulaychimus\_51:

(Start: 30 @45574 has 70 MA's), (Start: 31 @45562 has 12 MA's), (38, 45442), (40, 45412), (43, 45352), (44, 45316), (45, 45310), (50, 45178),

Gene: NEHalo\_58 Start: 40784, Stop: 40425, Start Num: 30

Candidate Starts for NEHalo\_58:

(2, 40985), (18, 40841), (19, 40838), (Start: 30 @40784 has 70 MA's), (Start: 31 @40772 has 12 MA's), (43, 40637), (44, 40601), (45, 40595), (50, 40463),

Gene: Nala\_43 Start: 35539, Stop: 35096, Start Num: 30

Candidate Starts for Nala\_43:

(17, 35611), (Start: 30 @35539 has 70 MA's), (Start: 31 @35527 has 12 MA's), (40, 35377), (43, 35317), (44, 35281), (45, 35275), (50, 35143),

Gene: Nibley\_68 Start: 46367, Stop: 45957, Start Num: 30

Candidate Starts for Nibley\_68:

(Start: 30 @46367 has 70 MA's), (Start: 31 @46355 has 12 MA's), (43, 46175), (44, 46139), (45, 46133), (50, 46001),

Gene: Obutu\_51 Start: 45593, Stop: 45150, Start Num: 30

Candidate Starts for Obutu\_51:

(Start: 30 @45593 has 70 MA's), (Start: 31 @45581 has 12 MA's), (38, 45461), (40, 45431), (43, 45371), (44, 45335), (45, 45329), (50, 45197),

Gene: Ohno789\_61 Start: 41528, Stop: 41148, Start Num: 30

Candidate Starts for Ohno789\_61:

(2, 41729), (18, 41585), (19, 41582), (Start: 30 @41528 has 70 MA's), (Start: 31 @41516 has 12 MA's), (43, 41360), (44, 41324), (45, 41318), (50, 41186),

Gene: PLOT\_85 Start: 59930, Stop: 60325, Start Num: 31

Candidate Starts for PLOT\_85:

(12, 59807), (Start: 31 @59930 has 12 MA's), (37, 60005), (42, 60077), (43, 60110), (44, 60146), (45, 60152), (50, 60284), (51, 60302),

Gene: Penelope2018\_84 Start: 59705, Stop: 60100, Start Num: 31

Candidate Starts for Penelope2018\_84:

(12, 59582), (Start: 31 @59705 has 12 MA's), (37, 59780), (42, 59852), (43, 59885), (44, 59921), (45, 59927), (50, 60059), (51, 60077),

Gene: Phayeta\_52 Start: 45475, Stop: 45032, Start Num: 30

Candidate Starts for Phayeta\_52:

(Start: 30 @45475 has 70 MA's), (Start: 31 @45463 has 12 MA's), (38, 45343), (40, 45313), (43, 45253), (44, 45217), (45, 45211), (50, 45079),

Gene: PherrisBueller\_60 Start: 39602, Stop: 39222, Start Num: 30

Candidate Starts for PherrisBueller\_60:

(2, 39803), (18, 39659), (19, 39656), (Start: 30 @39602 has 70 MA's), (Start: 31 @39590 has 12 MA's), (43, 39434), (44, 39398), (45, 39392), (50, 39260),

Gene: Pollywog\_86 Start: 51074, Stop: 51427, Start Num: 30

Candidate Starts for Pollywog\_86:

(2, 50873), (18, 51017), (19, 51020), (Start: 30 @51074 has 70 MA's), (Start: 31 @51086 has 12 MA's), (43, 51206), (44, 51242), (45, 51248), (50, 51380),

Gene: Prager\_84 Start: 59610, Stop: 60005, Start Num: 31

Candidate Starts for Prager\_84:

(12, 59487), (Start: 31 @59610 has 12 MA's), (37, 59685), (42, 59757), (43, 59790), (44, 59826), (45, 59832), (50, 59964), (51, 59982),

Gene: ProMouse\_60 Start: 41014, Stop: 40655, Start Num: 35

Candidate Starts for ProMouse\_60:

(2, 41281), (18, 41137), (19, 41134), (Start: 30 @41080 has 70 MA's), (35, 41014), (43, 40870), (44, 40834), (45, 40828), (50, 40696), (51, 40678),

Gene: RedRaider77\_10 Start: 3149, Stop: 3538, Start Num: 30

Candidate Starts for RedRaider77\_10:

(Start: 30 @3149 has 70 MA's), (Start: 31 @3161 has 12 MA's), (43, 3317), (44, 3353), (45, 3359), (50, 3491),

Gene: Rialto\_90 Start: 50654, Stop: 51067, Start Num: 30

Candidate Starts for Rialto\_90:

(10, 50531), (24, 50624), (25, 50633), (Start: 30 @50654 has 70 MA's), (34, 50711), (36, 50750), (43, 50846), (44, 50882), (45, 50888), (50, 51020),

Gene: Rimmer\_43 Start: 35365, Stop: 34928, Start Num: 30

Candidate Starts for Rimmer\_43:

(17, 35437), (Start: 30 @35365 has 70 MA's), (Start: 31 @35353 has 12 MA's), (40, 35203), (43, 35143), (44, 35107), (45, 35101), (50, 34969),

Gene: Rimu\_53 Start: 47304, Stop: 46915, Start Num: 30

Candidate Starts for Rimu\_53:

(Start: 30 @47304 has 70 MA's), (Start: 31 @47292 has 12 MA's), (43, 47136), (44, 47100), (45, 47094), (50, 46962),

Gene: Rita\_85 Start: 50514, Stop: 50948, Start Num: 29

Candidate Starts for Rita\_85:

(4, 50340), (6, 50355), (7, 50364), (11, 50394), (Start: 29 @50514 has 1 MA's), (Start: 31 @50538 has 12 MA's), (43, 50718), (46, 50814), (48, 50880), (49, 50904), (51, 50925),

Gene: Rita1961\_51 Start: 45594, Stop: 45151, Start Num: 30

Candidate Starts for Rita1961\_51:

(Start: 30 @45594 has 70 MA's), (Start: 31 @45582 has 12 MA's), (38, 45462), (40, 45432), (43, 45372), (44, 45336), (45, 45330), (50, 45198),

Gene: Sabbb\_88 Start: 48209, Stop: 48622, Start Num: 30

Candidate Starts for Sabbb\_88:

(3, 48035), (5, 48044), (8, 48068), (10, 48086), (24, 48179), (25, 48188), (Start: 30 @48209 has 70 MA's), (34, 48266), (36, 48305), (43, 48401), (44, 48437), (45, 48443), (50, 48575),

Gene: Sandaddy\_57 Start: 40445, Stop: 40086, Start Num: 30

Candidate Starts for Sandaddy\_57:

(2, 40646), (18, 40502), (19, 40499), (Start: 30 @40445 has 70 MA's), (Start: 31 @40433 has 12 MA's), (43, 40298), (44, 40262), (45, 40256), (50, 40124),

Gene: ScoobyDoobyDoo\_2 Start: 227, Stop: 613, Start Num: 30

Candidate Starts for ScoobyDoobyDoo\_2:

(Start: 30 @227 has 70 MA's), (Start: 31 @239 has 12 MA's), (43, 395), (44, 431), (45, 437), (47, 515), (50, 569),

Gene: Scowl\_62 Start: 40833, Stop: 40453, Start Num: 30

Candidate Starts for Scowl\_62:

(18, 40890), (19, 40887), (Start: 30 @40833 has 70 MA's), (Start: 31 @40821 has 12 MA's), (43, 40665), (44, 40629), (45, 40623), (50, 40491),

Gene: Shaboozey\_74 Start: 47299, Stop: 46889, Start Num: 30

Candidate Starts for Shaboozey\_74:

(Start: 30 @47299 has 70 MA's), (Start: 31 @47287 has 12 MA's), (43, 47107), (44, 47071), (45, 47065), (50, 46933),

Gene: Slim\_89 Start: 49993, Stop: 50406, Start Num: 30

Candidate Starts for Slim\_89:

(3, 49819), (5, 49828), (8, 49852), (10, 49870), (24, 49963), (25, 49972), (Start: 30 @49993 has 70 MA's), (34, 50050), (36, 50089), (43, 50185), (44, 50221), (45, 50227), (50, 50359),

Gene: SlippinJimmy\_52 Start: 46376, Stop: 45933, Start Num: 30  
Candidate Starts for SlippinJimmy\_52:  
(Start: 30 @46376 has 70 MA's), (Start: 31 @46364 has 12 MA's), (38, 46244), (40, 46214), (43, 46154), (44, 46118), (45, 46112), (50, 45980),

Gene: Soile\_53 Start: 47351, Stop: 46908, Start Num: 30  
Candidate Starts for Soile\_53:  
(Start: 30 @47351 has 70 MA's), (Start: 31 @47339 has 12 MA's), (38, 47219), (40, 47189), (43, 47129), (44, 47093), (45, 47087), (50, 46955),

Gene: Sorpresa\_58 Start: 40447, Stop: 40088, Start Num: 30  
Candidate Starts for Sorpresa\_58:  
(2, 40648), (18, 40504), (19, 40501), (Start: 30 @40447 has 70 MA's), (Start: 31 @40435 has 12 MA's), (43, 40300), (44, 40264), (45, 40258), (50, 40126),

Gene: SpikeBT\_59 Start: 40641, Stop: 40282, Start Num: 30  
Candidate Starts for SpikeBT\_59:  
(2, 40842), (18, 40698), (19, 40695), (Start: 30 @40641 has 70 MA's), (Start: 31 @40629 has 12 MA's), (43, 40494), (44, 40458), (45, 40452), (50, 40320),

Gene: StormChicken\_44 Start: 35973, Stop: 35536, Start Num: 30  
Candidate Starts for StormChicken\_44:  
(17, 36045), (Start: 30 @35973 has 70 MA's), (Start: 31 @35961 has 12 MA's), (40, 35811), (43, 35751), (44, 35715), (45, 35709), (50, 35577),

Gene: StrongArm\_59 Start: 41777, Stop: 41397, Start Num: 30  
Candidate Starts for StrongArm\_59:  
(18, 41834), (19, 41831), (Start: 30 @41777 has 70 MA's), (Start: 31 @41765 has 12 MA's), (43, 41609), (44, 41573), (45, 41567), (50, 41435),

Gene: SwainyDoc\_51 Start: 45606, Stop: 45163, Start Num: 30  
Candidate Starts for SwainyDoc\_51:  
(Start: 30 @45606 has 70 MA's), (Start: 31 @45594 has 12 MA's), (38, 45474), (40, 45444), (43, 45384), (44, 45348), (45, 45342), (50, 45210),

Gene: TDanisky\_93 Start: 48927, Stop: 49307, Start Num: 30  
Candidate Starts for TDanisky\_93:  
(Start: 30 @48927 has 70 MA's), (43, 49092), (44, 49128), (45, 49134), (50, 49266),

Gene: TeamEdward\_44 Start: 35970, Stop: 35533, Start Num: 30  
Candidate Starts for TeamEdward\_44:  
(17, 36042), (Start: 30 @35970 has 70 MA's), (Start: 31 @35958 has 12 MA's), (40, 35808), (43, 35748), (44, 35712), (45, 35706), (50, 35574),

Gene: Thibault\_65 Start: 47312, Stop: 46869, Start Num: 30  
Candidate Starts for Thibault\_65:  
(Start: 30 @47312 has 70 MA's), (40, 47150), (41, 47147), (43, 47090), (44, 47054), (45, 47048), (50, 46916),

Gene: Thoth\_84 Start: 59759, Stop: 60154, Start Num: 31  
Candidate Starts for Thoth\_84:  
(12, 59636), (Start: 31 @59759 has 12 MA's), (37, 59834), (42, 59906), (43, 59939), (44, 59975), (45, 59981), (50, 60113), (51, 60131),

Gene: TinyTerror\_51 Start: 45641, Stop: 45198, Start Num: 30

Candidate Starts for TinyTerror\_51:

(Start: 30 @45641 has 70 MA's), (Start: 31 @45629 has 12 MA's), (38, 45509), (40, 45479), (43, 45419), (44, 45383), (45, 45377), (50, 45245),

Gene: VasuNzinga\_9 Start: 2804, Stop: 3184, Start Num: 30

Candidate Starts for VasuNzinga\_9:

(Start: 30 @2804 has 70 MA's), (Start: 31 @2816 has 12 MA's), (43, 2972), (44, 3008), (45, 3014), (50, 3146),

Gene: Visconti\_85 Start: 59720, Stop: 60115, Start Num: 31

Candidate Starts for Visconti\_85:

(12, 59597), (Start: 31 @59720 has 12 MA's), (37, 59795), (42, 59867), (43, 59900), (44, 59936), (45, 59942), (50, 60074), (51, 60092),

Gene: WaldoWhy\_85 Start: 59683, Stop: 60078, Start Num: 31

Candidate Starts for WaldoWhy\_85:

(12, 59560), (Start: 31 @59683 has 12 MA's), (37, 59758), (42, 59830), (43, 59863), (44, 59899), (45, 59905), (50, 60037), (51, 60055),

Gene: Xiaokay\_68 Start: 48228, Stop: 47791, Start Num: 30

Candidate Starts for Xiaokay\_68:

(Start: 30 @48228 has 70 MA's), (40, 48066), (41, 48063), (43, 48006), (44, 47970), (45, 47964), (50, 47832),

Gene: Youngblood\_44 Start: 35976, Stop: 35539, Start Num: 30

Candidate Starts for Youngblood\_44:

(17, 36048), (Start: 30 @35976 has 70 MA's), (Start: 31 @35964 has 12 MA's), (40, 35814), (43, 35754), (44, 35718), (45, 35712), (50, 35580),