

Appendix 3.4.1 USFS Management Indicator Species (MIS)

Source: White River National Forest (11/2008)

Aquatic MIS

Two aquatic management indicator species were selected to monitor water quality (aquatic macroinvertebrate communities) and habitat quality and availability (common trout) in streams and rivers across the Forest. A sampling design was developed to select stratified random samples from across various types of management and livestock grazing types across the Forest. Level of management was based on the Forest Plan Management Area Prescriptions.

Management Area Prescriptions were divided into 4 groups – all 1's and 2's were combined (called "MA-1" in the table below), 3's and 4's were combined ("MA-3"), 5's were combined ("MA-5"), and 7's and 8's were combined ("MA-7"). Since livestock is largely independent of Management Area Prescription and can have significant effects to aquatic resources, the type of livestock grazing was also considered and each of the four categories of Management Area Prescriptions were divided into cattle grazing, sheep grazing, and no grazing to form 12 categories. Since very few areas fell into the Management Area Prescription category with 7's and 8's, all grazing types were combined into one category, reducing the total number of categories to 10 (e.g., "MA-1 Cattle" or "MA-1 C" in the tables below). Both common trout and aquatic macroinvertebrate communities were sampled from each site.

Five watersheds were randomly selected from each of the 10 management categories, with one site from each of the 10 management categories sampled each year over 5 years starting in 2003 with the rotation starting again in 2008. As such, in general sites have each been sampled once to establish a baseline, but no repeat sampling has occurred. There are a few exceptions where a site was dropped for a variety of reasons (i.e., there were no fish present at the site, the stream or river was too large or swift to be safely and effectively sampled with our equipment, or grazing had been discontinued at a site selected to monitor grazing). Most of the sites which were dropped for any of the above reasons have been replaced and baseline sampling has occurred, but there are a few exceptions. In addition, some sites have had macroinvertebrates sampled more than once. This is the case where these sites were needed to serve as Reference Sites for other projects across the Forest and therefore tend to be sites within Wilderness areas.

A report is prepared for each site each year it is sampled. These reports are maintained on the White River National Forest server and are available on request. Macroinvertebrate data is maintained in a WRNF database and maintained by Brian Healy, East Zone fisheries biologist. Fish sampling data is reported to the Colorado Division of Wildlife and maintained in the ADAMAS database in addition to being maintained in stream files on the Forest.

MIS 1: What is the potential habitat capability for each management indicator species?

The reason communities were selected for aquatic MIS was to be able to apply the aquatic MIS to all flowing waters across the Forest. As such, they cover everything from fishless perennial and ephemeral streams to large rivers and the habitat capability for each stream or river is unique based on many natural factors, such as stream size, parent geology in the watershed, elevation, topography or gradient, presence of barriers, etc. Therefore this question is virtually impossible to provide a meaningful answer and not applicable to aquatic MIS.

MIS 2: What is the current habitat suitability for each management indicator species?

To address this question, it is necessary to understand the current impacts to aquatic systems. Because aquatic MIS cover all flowing waters across the Forest, the answer to this question is necessarily broad. The best answer lies in the Forest-wide anthropogenic effects analysis conducted by the Regional Office as part of the Forest-wide aquatic assessment. Site specific information is available through Stream Health assessments, which determine if the stream

health condition is robust or has been degraded. In general, how these assessment link to population levels and habitat suitability has not been assessed.

MIS 3: *What are the long-term population trends for each management indicator species and the relationships between long-term population trends and the effects of management activities on habitats on NFS lands?*

As stated above, long-term population trends are not available yet since for most sites only the baseline information is available and repeat sampling will begin in 2008. At each site, a detailed physical survey is conducted as well as complete fish and macroinvertebrate data. A limited presentation of some of the key information collected is presented in the table on the next 2 pages.

Additional data collected at each site, but not presented here includes:

A complete **physical stream survey** with each habitat feature quantified and summary data including:

- The types of habitat units present (plunge pools, lateral scour pools, riffles, cascades, etc)
- A size distribution of the particles of the stream bed
- The condition of the banks (whether undercut or unstable)
- The wetted and bankfull widths
- Maximum, tail crest, and residual pool depths
- Average depth (across all habitat types)
- Shade
- Size and quantity of large wood in the channel
- Limited water temperature data

In addition to the density of each taxon present, **macroinvertebrate** metrics calculated include:

Total Density (N/m ²)	No. Plecoptera taxa	% Tolerant Organisms	% Scrapers	No. Diptera taxa
Diversity (d)	No. Trichoptera taxa	% Dominant Taxon	% Predators	No. Chironomidae taxa
Total Number of Taxa	% EPT	HBI	% Shredders	% Diptera
No. EPT taxa	% Ephemeroptera	BCI	No. Clinger taxa	% Chironomidae
No. Ephemeroptera taxa	No. Intolerant taxa	% Filterers	% Clingers	% Tribe Tanytarsini

Fish information collected includes the species and length of each individual captured, population estimates of each species encountered of fish at least one year old, and a combined population estimate for all trout species at the site. Information is also presented visually in a histogram.

Vegetative conditions are noted and photographed.

Aquatic MIS sampling partial results.

Site	Mgmt area	date	grad.	alk.	elevation	width	% fines	res.pool depth	#EPT	sed. sens.	Trout	other sp
Big Fish Creek	MA1-C	08/29/03	2.5	92	8800	8.0	12	na	23	9	81	sculpin
*Campbell Creek	MA1-C	08/30/05	8.5	na	8799	1.8	31.6	0.14	14	4	none	none
Capitol Creek	MA1-C	08/18/06	1.6	150	9075	6.6	8.2	0.35	18	5	54	none
Ripple Creek	MA1-C	08/12/04	2.4	104	8920	3.4	9	0.32	21	7	45	none
*Ute Creek	MA1-C	08/22/07	2.4	--	8973	--	--	--	16	6	none	none
Avalanche Creek	MA1-no	09/03/03	3	102	8748	10.1	11.8	0.2	18	8	31	sculpin
*Black Creek	MA1-no	08/09/07	--	--	9062	--	--	--	13	6	na	na
East Maroon Creek	MA1-no	08/16/06	0.9	80	9399	7.2	3.9	0.48	16	6	79	none
Snowmass Creek	MA1-no	09/08/04	2	85	8874	6.7	6.3	0.66	17	6	79	none
Upper Fryingpan	MA1-no	08/18/05	2	44	10058				19	8	76	none
East Fork Crystal River	MA1-S	08/26/04	2.9	154	10511	4.4	6.1	0.19	18	6	1	none
Meadow Creek	MA1-S	09/26/05	7.6	76	8533	4	10.7	0.24	24	10	40	sculpin
North Fork Piney River	MA1-S	09/12/06	5	160	8030	3.6	10.6	0.26	24	11	45	sculpin
Piney River	MA1-S	09/11/03	4	32	9759	6.2	4	0.57	21	7	24	none
South Fork White River	MA1-S	8/14,15/07	0.9	76	9117	10.7	3.2	na	18	5	75	none
*Beaver Creek	MA3-C	08/04/04	2.5	130	9606	1.9	68.3	0.2	7	1	9	none
*Cache Creek	MA3-C	08/09/06	7	380	9869	2.5	10.8	0.34	14	4	none	none
Cottonwood Creek	MA3-C	09/02/03	4.7	200	7950	1.1	37	0.12	17	6	3	none
East Brush Creek	MA3-C	08/31/05	3.6	90	9423	4.1	6.4	0.27	20	8	52	none
Gypsum Creek	MA3-C	8/15,16/07	5.7	120	8602	3.7	25.5	0.22	16	8	31	none
Snell Creek	MA3-C	08/21/07	6.2	144	8386	4.3	3.4	0.31	22	8	14	sculpin
Chapman Gulch	MA3-no	08/27/07	0.8	60	8596	4.5	13.4	0.45	25	8	60	sculpin
Crystal Creek	MA3-no	09/08/03	8.4	na	10513	2.3	21.7	0.28	21	8	5	none
Express Creek	MA3-no	07/15/04	na	53	10773	1.5	19	0.45	9	1	4	none
McCullough Gulch	MA3-no	08/07/07	2.9	32	11329	4.2	8.7	0.42	13	3	none	none

South Fork Fryingpan	MA3-no	08/17/05	3	68	9488	8.0			11	5	128	none
Buck Creek	MA3-S	09/09/03	3	174	9960	2.5	4	0.24	16	6	77	none
Deep Creek (Eagle RD)	MA3-S	08/29/06	3	128	10597	3.6	4.8	0.25	20	6	136	sucker
East Fork Fawn Creek	MA3-S	08/20/07	7.4	320	7842	2.7	13.3	0.31	19	8	104	none
Milk Creek	MA3-S	08/15/05	3	164	8048	3.5	15.9	0.17	11	3	5	none
Morapos Creek	MA3-S	08/10/04	2.7	236	8150	2.5	15.3	0.28	20	3	36	sculpin dace
Cattle Creek	MA5-C	08/10/06	3	200	8562	3.7	25.9	0.35	19	8	75	sculpin
Derby Creek	MA5-C	09/29/05	2	156	7875	6.7	9.8	0.4	19	5	31	none
East Elk Creek	MA5-C	08/02/05	3.4	120	6450	7.5	6.7	0.21	19	6	28	sculpin
East Miller Creek	MA5-C	08/26/03	1	140	7198	4.7	22.5	0.29	10	5	14	sculpin
*Fourmile Creek	MA5-C	09/01/04	1.7	250	9040	2.4	45.7	0.2	na	na	none	sculpin
Middle Thompson Creek	MA5-C	08/29/07	na	168	7410	na	7.8	na	21	8	40	sculpin
Bennett Gulch	MA5-no	09/04/03	4.97	43	9908	1.5	22.2	0.14	20	7	26	none
*Miller Creek	MA5-no	08/03/06	4	80	8580	1.6	6.9	0.22	9	4	none	none
Miners Creek	MA5-no	08/06/07	3.7	20	9462	3.4	17.4	0.22	20	8	54	none
North Barton Gulch	MA5-no	07/22/04	5.1	44	10000	1.1	30.7	0.21	16	8	2	none
South Fork Swan	MA5-no	08/17/05	6.1	60	10020	2.4	6.1	0.17	21	8	23	none
West Grouse Creek	MA5-no	08/01/07	7.5	44	9397	3.2	10.4	0.22	17	7	47	none
Deep Creek (Rifle RD)	MA5-S	08/18/04	3.3	168	8905	2.2	22.5	0.17	12	4	45	none
East Canyon Creek	MA5-S	9/4, 10/2/03	2.4	174	9976	2.5	12.8	0.29	15	5	14	none
Resolution Creek	MA5-S	08/15/06	3.6	180	9595	2.8	20.3	0.24	21	9	42	none
Three Forks Creek	MA5-S	08/02/07	2	232	7581	3.9	na	0.48	7	1	29	none
Turkey Creek	MA5-S	09/01/05	5.8	200	9196	4.6	8.7	0.19	22	9	26	none
Castle Creek	MA7	08/28/07	1.5	188	8828	7.4	2.4	0.24	20	7	34	sculpin
Keystone	MA7	08/08/06	4.8	68	9992	3.0	7.8	0.27	18	8	40	none

Gulch												
Two Elk Creek	MA7	08/05/04	7.6	170	9220	3.2	26	0.32	17	6	28	none
West Tenmile Creek	MA7	08/23/05	2.5	112	9997	5.9	3.2	0.16	15	6	71	sculpin

*these sites have or will be replaced and will not be continued. In some cases, physical data was not collected at these sites.

Table column definitions:

Mgmt area: code for which management area this site represents MA is the level of activity, C = cattle grazing, "no" = no livestock grazing, and "S" = sheep grazing.

Date = date sampled

grad. = reach gradient

alk. = total alkalinity in ppm

elevation = elevation at bottom of the reach

width = average wetted width of sampled reach

% fines = % of particles less than 6mm from Wolman pebble count

res.pool depth = average residual pool depth

#EPT = the number of Ephemeroptera, Plecoptera, and Trichoptera taxa collected during macroinvertebrate sampling

sed.sens. = A WRNF specific metric of sediment sensitive macroinvertebrate taxa collected

Trout = population of trout captured in the sampled reach based on a multiple pass depletion estimate (excludes young-of-year)

Other sp. = other species of fish also present

The table below displays two key macroinvertebrate metrics from the eight sites which were sampled more than once. These sites were not randomly selected for repeat sampling (therefore they are not representative) and were usually chosen to provide “reference” site data for analysis for various projects across the Forest. Although there is not sufficient data to determine trends, in general sites seemed to support a more diverse community in later sampling.

Site (management code)	metric	2003	2004	2005	2006	2007
Avalanche Creek (MA1 – no grazing)	# EPT	18		21		
	sed.sens.	8		9		
Big Fish Creek (MA1 – cattle grazing)	# EPT	23			26	18
	sed.sens.	9			9	5
East Maroon Creek (MA1 – no grazing)	# EPT				16	17
	sed.sens.				6	7
McCullough Gulch (MA3 – no grazing)	# EPT	11				13
	sed.sens.	2				3
Piney River (MA1 – sheep grazing)	# EPT		21	17		
	sed.sens.		7	6		
Ripple Creek (MA1 – cattle grazing)	# EPT		21		26	21
	sed.sens.		7		10	9
Snowmass Creek (MA1 – no grazing)	# EPT		17			23
	sed.sens.		6			7
Two Elk Creek (MA7)	# EPT		17	23		
	sed.sens.		6	9		

MIS 4: *Are the selected management indicator species and their response to management activities in habitats on local National Forest System lands adequately representing management effects on other species in the associated response guilds and is the species membership identified for each response guild reasonably accurate and complete?*

Communities were selected as aquatic MIS in order to assure that the response guilds were represented.

T&E 1: To what extent are NFS lands and their management contributing to the recovery and viability of T&E Species?

T&E 2: To what extent are NFS lands and their management contributing to the viability of recently delisted species?

T&E 3: Are actions identified in national recovery plans for threatened and endangered species being implemented where opportunities exist on national grasslands and forests?

T&E 4: Are actions identified in national recovery plans for threatened and endangered species being implemented where opportunities exist on national grasslands and forests?

Viability 1: To what extent are National Forest System Lands and their management contributing to the viability of sensitive plant and animal species and species of viability concern?

Colorado River cutthroat trout (CRCT) is a sensitive species as well as a species of viability concern on the White River National Forest. A recent range-wide status assessment determined that this subspecies has been extirpated from over 80% of its historical range. Many remaining populations are hybridized with rainbow trout and other subspecies of cutthroat trout.

Genetic information on populations on the WRNF was largely lacking. It is critical to understand the genetic composition of our populations. If a population is greater than 90% pure, it is considered a "Conservation Population" according to the Colorado River Cutthroat Trout Conservation Team. Populations with no apparent hybridization would be appropriate for reintroduction into new waters. **Over the past 5 years, the WRNF and the Colorado Division of Wildlife have made significant progress on determining the genetic status of unknown populations, tripling the number of populations tested** (or awaiting results). Genetic testing is quite expensive and costs about \$2000 for each population, therefore funding limits the amount of genetic testing we can accomplish. Funding for genetic testing has come from WRNF appropriated program dollars, the CDOW, and from a grant obtained through Trout Unlimited.

There are approximately 99 waters on the WRNF with CRCT. Forty-six of those populations were classified by the CDOW as "conservation populations" although most had not been tested genetically. Before 2003, only 11 of these populations had been tested. Since that time, nine more populations have been tested and samples have been collected from 3 additional populations and we are awaiting the results. Twenty-three conservation populations still have no genetic testing.

Of the 53 populations not considered conservation populations, only two had been tested in the past. The reason is that conservation populations were considered a higher priority for the limited funding available for genetic testing. In the past 5 years, fifteen additional populations have been tested and another 4 have had samples collected and we are awaiting the results. Of the 15 populations tested, seven qualify as "conservation populations" and will be added to that list. In addition, one previously unknown population was discovered during random MIS sampling and that population was determined to be completely pure, with no signs of introgression making this population an appropriate source for reintroduction efforts in the watershed.

Information on genetic testing as well as additional survey information collected on CRCT populations is maintained in a GIS based database maintained by the Colorado River cutthroat trout conservation team, a tri-state multi-agency team to which the Forest Service is a signatory member. Additional information in the database includes: population density estimates, location and significance of barriers, population distribution, etc. Specific genetic results are maintained electronically and in paper form in the WRNF Supervisor's office by the Forest Fisheries Biologist.

Boreal toad is another aquatic species with focused monitoring. This monitoring is conducted in partnership with the Colorado Division of Wildlife and the Colorado Natural Heritage Program. Eighteen sites have been or are currently monitored on or near the WRNF in Eagle, Pitkin, and Summit counties. Fourteen of the 18 sites have been tested for chytrid fungus and four have tested positive (East Vail, Conundrum Creek, Campground Lift ponds, and Peru Creek). Inactive beaver ponds are an important habitat type for boreal toads. Therefore, boreal toad breeding in beaver complexes can be difficult to monitor as the toads move their breeding sites to accommodate the changing conditions in the complex. The boreal toad recovery team defines a "population" as "one or more breeding localities which are located within a common second or third order drainage, and separated by no more than five miles." A summary of the monitoring by county is presented below.

There are three populations (four sites) being monitored in Eagle County. All sites have been tested for chytrid fungus and the East Vail site has tested positive. One of the sites appears to be declining. No breeding has been detected at the **Holy Cross City** site during the last four years. Recreation use (hiking and jeeping) was noted as very high adjacent to the breeding pond. It is unknown if this use has contributed to the apparent decline. **East Lake Creek** site appears to be stable, however monitoring is limited due to the remote location. Despite testing positive for chytrid fungus, the **East Vail** site appears to be staying strong with abundant one year old and juvenile toads recorded at the site. It is possible that because the East Vail site is at a lower elevation, the habitat is less harsh and the toads are better able to survive with chytrid present.

Limited data has been collected at **Strawberry Lakes** due to difficult access and there may be more reproduction than recorded. There is no apparent trend at the Strawberry Lakes site. (All site condition information from Tina Jackson, CDOW, personal communication).

The table below summarizes some of the information available for boreal toad monitoring for sites on or near the White River National Forest in Eagle County. The first column under each site is the number of males, females, and egg masses detected during surveys (yearlings and juveniles were also counted, but are not presented here). Testing for chytrid fungus ("BD") was conducted at each site at least once. The result is presented (negative = "neg" and positive = "pos" with the total number of samples tested in parentheses). (Data provided by Tina Jackson, Colorado Division of Wildlife)

Year	EA01 – Holy Cross City		EA02 – East Lake Creek		EA03 – East Vail		EA04 – Strawberry Lakes	
	M/F/egg	BD test	M/F/egg	BD test	M/F/egg	BD test	M/F/egg	BD test
1996	1/1/1		1/1/1					
1997	1/1/1		n/a					
1998	2/2/2		3/0/0					
1999	2/0/0		4/4/4		3/1/1			
2000	1/0/0		2/2/2		8/2/1			
2001	1/1/1		1/0/0		32/4/3			
2002	2/1/1		2/2/2		7/1/1			
2003	2/1/1	neg. (2)	2/2/2		4/1/1		1/1/1	
2004	1/0/0		2/2/2	neg (3)	5/1/1	neg (8)	1/1/1	
2005	1/0/0		16/1/1	neg (20)	8/2/2	pos (9)	0/2/0	
2006	0/0/0		5/0/1	neg (20)	6/1/1		no data	neg (14)
2007	1/0/0		8/1/1		2/2/2		3/2/2	

There are four populations (six sites) being monitored in Pitkin County. Four of the sites have been tested for chytrid fungus and the Conundrum Creek and Campground Lift ponds sites have tested positive. Of the two sites with long term monitoring, the **Conundrum Creek** site appears to be lost. Comments from past surveys have noted declining conditions and at least one year in which one of the breeding ponds was dry. It is not known if this site succumbed to chytrid fungus or moved to more suitable habitat. The **East Maroon Creek** site is staying strong with yearlings and subadults observed every year. The other four sites were recently discovered and no trend information is available. Of these, **Lincoln Creek** and **Homestake Reservoir** sites appear to be strong and **Grizzly Reservoir** and **Campground Lift ponds** have not had limited successful reproduction during the limited period monitored with metamorphs observed during the first year. (All site condition information from Tina Jackson, CDOW, personal communication).

The table below summarizes some of the information available for boreal toad monitoring for sites on or near the White River National Forest in Pitkin County. The first column under each site is the number of males, females, and egg masses detected during surveys (yearlings and juveniles were also counted, but are not presented here). Testing for chytrid fungus ("BD") was conducted at three sites. The result is presented (negative = "neg" and positive = "pos" with the total number of samples tested in parentheses). (Data provided by Tina Jackson, Colorado Division of Wildlife)

Year	PI01 Conundrum Creek		PI02 East Maroon Creek		PI03 Lincoln Creek	PI04 Grizzly Reservoir	PI05 Campground Lift ponds		PI06 Homestake Reservoir	
	M/F/egg		M/F/egg	BD test	M/F/egg	M/F/egg	M/F/egg	BD test	M/F/egg	BD test
1995	3/1/1									
1996	1/1/1									
1997	2/2/2									
1998	2/2/0									
1999	0/0/0									
2000	2/2/2		3/3/3							
2001	3/9/3		3/3/3							
2002	1/1/1		3/3/3							
2003	0/0/0		3/3/3	neg (4)						
2004	0/0/0		7/1/1	neg (3)						
2005	0/0/0		2/2/2	neg (8)	0/0/0			neg (2)		
2006	0/0/0		2/2/2	neg (20)	0/0/1	0/0/0	0/1/0		found	neg (4)
2007	0/0/0	pos*	5/5/5		2/2/2	0/0/0	0/0/0	pos (14)	4/2/2	

* Conundrum Creek was found to be chytrid positive, year and number of samples taken were unavailable at the time this report was written (Tina Jackson, CDOW, personal communication)

There are three populations (eight sites) being monitored in Summit County. Six sites have been tested for chytrid fungus and Peru Creek has tested positive. At least three of the Summit County sites appear to have a negative trend. **Cucumber Gulch** appears to be declining and may be gone. This site is difficult to survey due to limited access and the large size of the wetland. The **Peru Creek** site also appears to be in decline. The **Montezuma** site has not been monitored since 2002 due to access limitations. **Upper North Tenmile** appears to be remaining strong, although tadpoles were apparently lost in 2007. This site is somewhat difficult to monitor. **Lower North Tenmile** has had a couple bad years in 2006 and 2007. Not enough information is available to know whether this is a trend. Surveyors reported higher than normal water levels. It is possible this population relocated. No inferences can be made about the **Upper North Fork Snake River** site. Breeding has not been recorded since 2002. In 2006, there was a large chemical spill which impacted this breeding site. The **Lower North Fork Snake River** site is experiencing a negative trend and this site appears to be lost. In addition, the 2006 chemical spill also affected this site. **Straight Creek** has been monitored since 2003 when breeding was recorded. No toads have been sighted since then. It is possible that this site was only used in 2003 when the population's usual breeding site was less suitable and that they returned to it. (All site condition information from Tina Jackson, CDOW, personal communication).

The table below summarizes some of the information available for boreal toad monitoring for sites on or near the White River National Forest in Summit County. The first column under each site is the number of males, females, and egg masses detected during surveys (yearlings and juveniles were also counted, but are not presented here). Testing for chytrid fungus ("BD") was conducted at 6 of the 8 sites at least once. The result is presented (negative = "neg" and positive = "pos" with the total number of samples total in parentheses). (Data provided by Tina Jackson, Colorado Division of Wildlife)

Year	SU01 Cucumber Gulch		SU02 Montezuma		SU03 Peru Creek		SU04 Upper North Tenmile	
	M/F/egg	BD test	M/F/egg	BD test	M/F/egg	BD test	M/F/egg	BD test
1995	1/1/1		7/1/1				6/6/6	
1996	?/?/0		9/?/0		1/1/1		17/6/6	
1997	2/1/1		1/1/1		6/2/2		13/3/3	
1998	1/0/0		0/0/0		3/1/1		18/3/1	
1999	1/1/1		3/1/1		14/1/1		2/3/3	
2000	0/1/0		0/0/0		19/1/1		7/4/4	
2001	0/0/0				29/1/1		8/2/2	
2002	0/0/0		0/0/0		2/1/1		8/8/8	
2003	0/0/0					pos (2)	1/1/1	neg (3)
2004	0/0/0				0/0/0		5/1/1	neg (4)
2005	1/1/0				0/0/0		2/2/2	neg (6)
2006					0/0/0		0/1/0	
2007	0/0/0				0/1/0		3/3/3	

Year	SU05 Lower North Tenmile		SU06 Upper North Fork Snake River		SU07 Lower North Fork Snake River		SU08 Straight Creek	
	M/F/egg	BD test	M/F/egg	BD test	M/F/egg	BD test	M/F/egg	BD test
1995								
1996	4/2/2							
1997	1/2/1							
1998	5/5/5		1/2/1		1/2/1			
1999	3/2/1		1/1/1		1/2/0			
2000	5/3/2		1/1/1		1/1/0			
2001	3/4/3		1/1/1		1/0/0			
2002	2/2/2		1/2/1		0/0/0			
2003	2/2/2			neg (3)			1/1/1	neg (7)
2004	1/1/1		16/0/0	neg (1)	1/0/0	neg (16)	0/0/0	
2005	4/4/4	neg (2)	20/0/0	neg (14)	0/0/0		0/0/0	
2006	2/0/0	neg (3)	20/0/0		0/0/0		0/0/0	
2007	0/0/0		0/0/0		0/0/0		0/0/0	